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**92nd General Meeting**

26-30 May 1992

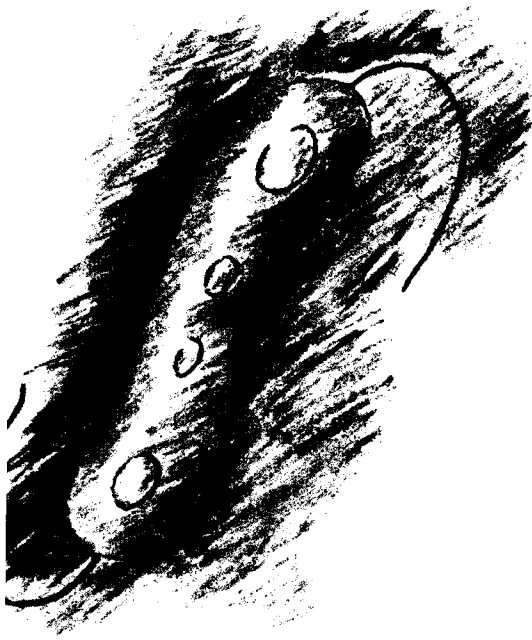
New Orleans, Louisiana

**PROGRAM**



Grant No. DAMD17-92-J-2015

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**APR 12 1993**  
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*American Society for Microbiology*

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## FUTURE MEETINGS

### *General Meeting of the Society*

1993: Atlanta, Ga., 16-20 May. Abstract forms for the submission of papers will be distributed with the August 1992 issue of the *ASM News*.

1994: Las Vegas, Nev., 1-4 May.

### *Interscience Conference on Antimicrobial Agents and Chemotherapy*

1992: Anaheim, Calif., 11-14 October.

1993: New Orleans, La., 17-20 October.

### *Upcoming ASM Conferences*

30 August-4 September 1992. ASM Conference on Anaerobic Dehalogenation of Bacteria and Its Environmental Implications. University of Georgia, Athens.

11-16 October 1992. ASM Conference on Genetics and Molecular Biology of Industrial Microorganisms. Bloomington, Ind.

15-19 November 1992. ASM Conference on the Biology of Halophilic Bacteria: Research Priorities for the 1990s. Williamsburg, Va.

25-28 March 1993. ASM Conference on Candida and Candidiasis. Baltimore, Md.

April 1993. ASM Conference on Water Quality. San Juan, Puerto Rico.

# REPORT DOCUMENTATION PAGE

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# Program

of the

## 92nd General Meeting

of the

### American Society for Microbiology

Tuesday through Saturday, 26-30 May 1992

DTIC QUALITY INSPECTED

New Orleans, La.

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# The 92nd General Meeting of the American Society for Microbiology

New Orleans, La.  
26-30 May 1992

## INVITATION

ASM will hold its 92nd General Meeting in New Orleans, La. ASM '92 is scheduled from 26 to 30 May 1992.

You can enjoy the many fun activities that New Orleans has to offer while you learn of the latest advances in your field of scientific interest. Hotel rooms are in abundance, and all have easy access to the New Orleans Convention Center, the venue for this year's meeting, via ASM's continuous shuttle service. The General Meeting Program Committee has once again organized a comprehensive scientific program consisting of symposia, seminars, round tables, and slide and poster sessions, all planned with an eye to giving you the most up-to-date information possible. Technical and scientific exhibitors will display their latest products and services during the meeting.

## GENERAL INFORMATION

### Hotel Reservations

Hotel rooms will be available for all interested individuals who use the Telephone Housing Form (p. vii) and respond by the published deadline to the phone number noted. Only reservations placed through the housing bureau will receive convention rates.

Hotels will send confirmations for all reservations received by 20 April 1992. Reservations must be placed with the ASM Housing Bureau only. Rooms will be assigned at the convention rates on a space-available basis. All hotels require a deposit for the first night's occupancy by a date that will be noted on the reservation confirmation. If the deposit is not received by the hotel, the reservation will be cancelled.

If a reservation cannot be used, please make it available for reassignment by prompt cancellation. If any other changes must be made, please make them directly with the hotel after receipt of the reservation confirmation. Deposits are nonrefundable if cancellation is not received within 72 hours of your scheduled arrival.

### Discounted Air Travel

Delta Airlines and American Airlines are the official co-carriers for ASM's 92nd General Meeting.



Delta Airlines is offering the following special discount air fares to New Orleans for those attending the General Meeting:

- 40% off full coach fares on Delta's domestic system
- 35% off full coach fares from Canada
- 5% off promotional fares

To take advantage of these Delta discounts, call 1-800-241-6760 and refer to file number HO112. Reservations can be booked through Delta's Meeting Network seven days a week, from 8:00 A.M. to 8:00 P.M. (Eastern time).

American  
Airlines



American Airlines is pleased to offer discount airfare to ASM's 92nd General Meeting. Choose from the following discounts:

- 50% off full coach fares from the 48 contiguous states, Hawaii, Puerto Rico, and the Virgin Islands.
- 40% off full coach fare from Canada
- 5% off lowest promotional fare (rules and restrictions apply)

To receive one of the above discounts you must make your reservations through the American Airlines Meeting Desk (1-800-433-1790) and mention ASM's STAR file number S12Z2G5. You may book your reservations through the American Airlines Meeting Desk seven days a week, from 7 A.M. to 12 midnight (Central time).

### Discounted Car Rental



Where all the miles  
are free™

Alamo Rent a Car has been appointed the official car rental company for the 92nd General Meeting of the American Society for Microbiology, 26-30 May 1992, in New Orleans, La. Special discounted rates have been extended one week prior to and one week following the meeting. **UNLIMITED FREE MILEAGE.** Be sure to inquire about **SPECIAL LOW ASM RATES** that provide even greater savings for rentals over the Memorial Day weekend only. Come early and take a drive through the swamp country or visit the plantations along River Road before the ASM meeting. To make reservations call Alamo at 1-800-732-3232 and request Group I.D. #247853 and Rate Code G1 if you want to take advantage of the Memorial Day weekend special. Rate Code G3 is for all other times and rates.



## Parking Facilities at the New Orleans Convention Center

The New Orleans Convention Center has three surface lots and two garage levels for a total of 1,908 parking spaces. Fees are \$4 per day in the garage or \$3 per day for outdoor parking. An unlimited access pass for the duration of the meeting will be available for \$33 and may be purchased at the exhibitor service center. Refer to the ASM Housing Form for parking fees at official ASM hotels.

## Bus Service

Shuttle buses will provide frequent service between the participating hotels and the New Orleans Convention Center during the days of the General Meeting. Continuous shuttle service will be provided during the day. Buses will also operate during Tuesday registration hours and for the Opening Session at the Convention Center and Opening Reception at the New Orleans Aquarium of the Americas. To accommodate those attending the Wednesday, Thursday, and Friday late afternoon scientific sessions, the last buses will depart from the Convention Center 15 minutes after the close of the last sessions.

Shuttle service is provided only to registrants who have reserved hotel rooms via the ASM Housing Bureau. Exact bus schedules will be posted in the lobbies of all ASM hotels and the New Orleans Convention Center.

Bus service is available for those who are disabled. Please contact ASM Headquarters for further information.

## Advance Registration

Preregistrants will receive confirmation by mail. Badges will be mailed beginning 20 April 1992.

Note that credit card registration is available for advance as well as on-site registration.

U.S. members and nonmembers who preregister and pay \$25 will receive the *Abstracts of the General Meeting of the American Society for Microbiology* (if ordered) by mail. Abstracts ordered by international preregistrants will be available for pickup at the Preregistered counter in the New Orleans Convention Center; **please present your meeting registration confirmation in order to obtain your abstracts.**

Additional registration forms are available from the ASM Meetings Department, 1325 Massachusetts Avenue, N.W., Washington, DC 20005 [ASM Meetings Hotline (202) 737-0377].

## Registration

Registration and associated activities will be in the New Orleans Convention Center. Registration hours will be as follows:

Monday, 25 May

(Exhibitors only) .....	8:00 A.M.–5:00 P.M.
Tuesday, 26 May .....	8:00 A.M.–8:00 P.M.
Wednesday, 27 May .....	7:00 A.M.–5:00 P.M.
Thursday, 28 May .....	8:00 A.M.–5:00 P.M.
Friday, 29 May .....	8:00 A.M.–5:00 P.M.
Saturday, 30 May .....	8:00 A.M.–2:00 P.M.

Only members who have paid 1992 ASM dues can register at member rates. Members who register at the time of the meeting must present a 1992 Membership Card or have their status verified at the Membership Desk. Students must also certify their student status by presenting a 1992 Student Membership Card or other certification of student status at the Membership Desk.

Preregistration and on-site registration fees are listed below and on the registration form. Those who preregister are entitled to a discount.

	Before 20 April	After 20 April
Member* .....	\$ 85	\$105
Nonmember* .....	\$135	\$155
Emeritus or honorary member* .....	\$ 35	\$ 45
Student (member)* .....	\$ 35	\$ 45
Student (nonmember)* .....	\$ 50	\$ 60
Spouse (nonscientist) .....	\$ 20	\$ 20
Abstracts of 1992 General Mtg. ....	\$ 25	\$ 25
CME Credit Form .....	\$ 10	\$ 10

\*Includes a copy of the *Program*.

Personal checks and credit cards will be accepted only for the exact amount of registration fees.

Admission to sessions and exhibits will be restricted to those displaying the official registration badge.

## Location of Scientific Sessions

All of the scientific sessions will be located in the New Orleans Convention Center. For exact session locations, consult the session listings in the *Program* and the floor plans inside the back cover of the *Program*. A section of Exhibit Hall C has been set aside for poster sessions.

## ASM Programs and Services

In the lobby of the New Orleans Convention Center, ASM headquarters staff will operate booths where meeting attendees may find information about ASM membership, education and professional recognition programs, and the American Academy of Microbiology. The latest ASM publications will be available for purchase as well. All ASM booths will be open during published registration hours.

# TELEPHONE HOUSING FORM—DO NOT MAIL

92nd General Meeting, New Orleans, La.

26–30 May 1992

1-800 HOUSING INSTRUCTIONS

**DEADLINE:** U.S. attendees, 20 April 1992; non-U.S. attendees, 13 April 1992

United States (including Alaska and Hawaii)

..... (800) 345-1187

Metropolitan New Orleans Area

..... (504) 566-5005

Fax (non-U.S. registrants only)

..... (504) 522-6123

Prior to calling the Housing Bureau for reservations please read all housing information carefully and complete the form below. It may take 3 to 4 minutes to complete your call, but less if you have all of the following information ready when you place your reservation. The Housing Bureau is open Monday to Friday from 7:00 a.m. to 7:00 p.m. (central standard time).

All hotels require a deposit equal to one night's room rate (including tax). Deposits can be made by credit card or check. If you are making your deposit by check, send the deposit directly to the hotel upon receipt of the hotel's acknowledgment. For groups of 25 or more, first and last night's room deposits will be required.

## Accommodation Requested:

Hotel Choices: 1st Choice \_\_\_\_\_

2nd Choice \_\_\_\_\_

3rd Choice \_\_\_\_\_

Room must be suitable for handicapped

Single (1 person, 1 bed)

Double (2 persons, 1 bed)

Twin (2 persons, 2 beds)

Suite

Please note those sharing a room.

Name	Arrival Date/Hour	Departure Date
------	-------------------	----------------

_____	_____	_____
_____	_____	_____

For reservation deposits via a major credit card, provide the following information:

\_\_\_\_\_

Type of credit card

\_\_\_\_\_

Credit card number

\_\_\_\_\_

Expiration date

## SEND CONFIRMATION TO:

Name \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

City, state, ZIP code \_\_\_\_\_

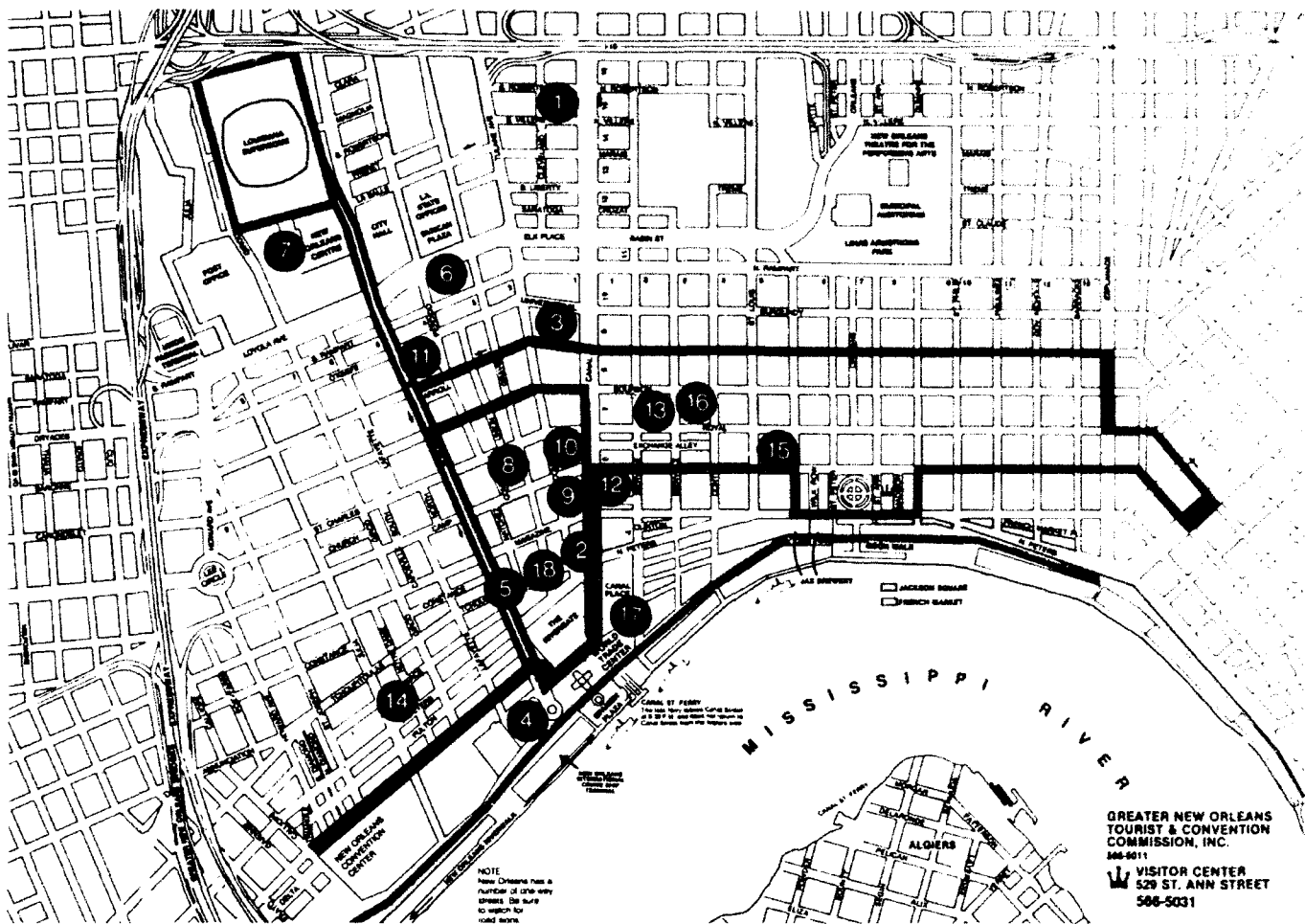
Telephone no. \_\_\_\_\_

Fax no. \_\_\_\_\_

An acknowledgment will be sent to you by the Housing Bureau, and confirmation will be sent to you by your assigned hotel. Please read your confirmation immediately and carefully for instructions regarding deposit requirements and check-in.

**ALL CHANGES OR CANCELLATIONS SHOULD BE MADE DIRECTLY WITH THE HOUSING BUREAU ((504) 566-5005). CANCELLATIONS MADE LESS THAN 72 HOURS BEFORE ARRIVAL SHOULD BE MADE DIRECTLY WITH THE HOTEL TO ENSURE PROPER CREDIT.**

Note: To take advantage of ASM services and amenities such as ASM Shuttle Bus Service, Daily ASM Conference Journal, and Direct Line Service, registrants must use the ASM Housing Bureau and stay at an official ASM hotel.



### ASM Official Hotels, New Orleans

Code/hotel	Rate (\$) <sup>a</sup>		Room service	No. of restaurants	No. of bars/lounges	Pool	Health club	Parking (\$ per day)	Credit cards
	Single	Double							
1. Clarion	88	88	Yes	2	1	Yes	Yes	9	All
2. Doubletree	98	98	Yes	1	1	Yes	Yes	9	All
3. Fairmont	95	95	Yes	3	1	Yes	No <sup>b</sup>	10	All
4. Hilton	100 <sup>c</sup>	100 <sup>c</sup>	Yes	6	4	Yes	Yes	10	All
5. Holiday Inn Crowne Plaza	95	95	Yes	2	1	Yes	Yes	9	All
6. Holiday Inn Downtown	79	89	Yes	1	1	Yes	No	9	All
7. Hyatt Regency	99 <sup>d</sup>	99 <sup>d</sup>	Yes	3	2	Yes	No <sup>b</sup>	10	All
8. Inter-Continental	100	100	Yes	3	2	Yes	No <sup>b</sup>	9	All
9. ITT Sheraton New Orleans (ASM Headquarters)	110	120	Yes	3	1	Yes	Yes	9	All
10. Le Meridien	100	100	Yes	1	1	Yes	Yes	10	All
11. Le Pavillon	89	89	Yes	1	1	Yes	No <sup>b</sup>	9	All
12. Marriott	105	105	Yes	4	2	Yes	Yes	9	All
13. Monteleone	98	98	Yes	3	3	Yes	Yes	8	All
14. Radisson Suites	110	110	Yes	1	1	Yes	No <sup>b</sup>	10	All
15. Omni Royal Orleans	99	99	Yes	2	1	Yes	Yes	9	All
16. Royal Sonesta	100	100	Yes	2	1	Yes	Yes	10	All
17. Westin	110	110	Yes	1	2	Yes	Yes	10	All
18. Windsor Court	110	125	Yes	1	2	Yes	Yes	15	All

<sup>a</sup>All hotel room rates are subject to 11% tax plus \$3 per room, per night occupancy tax. Taxes are subject to change without notice.

<sup>b</sup>Exercise facilities for guest use nearby.

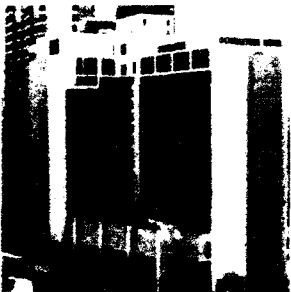
<sup>c</sup>Riverside/executive, \$110.

<sup>d</sup>Government rate, \$72.

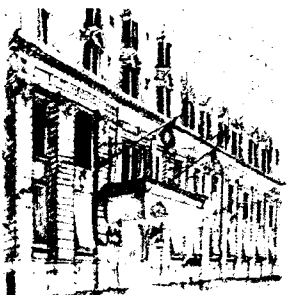
## 1992 ASM Official Hotels



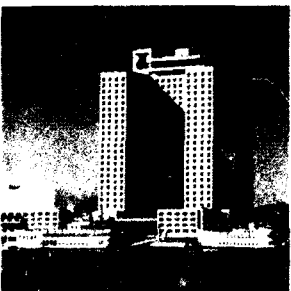
1. **CLARION** (*\$88 single/\$88 double*): This recently renovated historic landmark is just minutes from the Louisiana Superdome. The hotel provides a free shuttle to the New Orleans Centre Shopping Mall, the Riverwalk, and the Aquarium of the Americas. The Clarion offers affordable elegance, fine dining and the ambiance of New Orleans. (504) 522-4500.



2. **DOUBLETREE** (*\$98 single/\$98 double*): Located on Canal Street overlooking the Mississippi River and within walking distance of the Convention Center, the Doubletree captures a country French atmosphere. The hotel features an outdoor pool and fitness center, as well as fine New Orleans style dining facilities. (504) 581-1300.



3. **FAIRMONT** (*\$95 single/\$95 double*): Conveniently located near the French Quarter and the ASM headquarters hotel, in the center of the Shopping District. This elegant hotel is among the oldest grand hotels in the country and is known as the "grande dame" of New Orleans. Enjoy fine dining and excellent recreation facilities, including rooftop tennis courts and outdoor swimming pool.



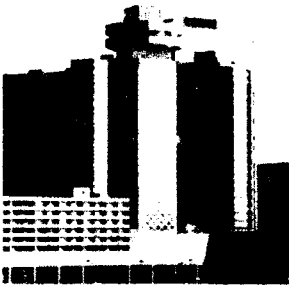
4. **HILTON** (*\$100 single/\$100 double/\$110 riverside/executive*): Adjacent to the Convention Center and connected to the Riverwalk Marketplace on the Mississippi River, this unique luxury hotel features six award-winning restaurants, four lounges, and one of New Orleans' premiere health clubs with indoor tennis, racquetball, and basketball. (504) 561-0500.



5. **HOLIDAY INN CROWNE PLAZA** (*\$95 single/\$95 double*): Located in the heart of the Central Business District, just three blocks from the French Quarter, Convention Center, and Riverwalk, this hotel features two restaurants, nightly entertainment, an outdoor pool, and exercise facilities. (504) 525-9444



6. **HOLIDAY INN DOWNTOWN** (*\$79 single/\$89 double*): Located near the Louisiana Superdome and the New Orleans Centre Shopping Mall, this hotel features a newly opened executive floor with private club room and extra amenities, as well as a heated pool, hydro spa, restaurant, and lounge. (504) 581-1600.



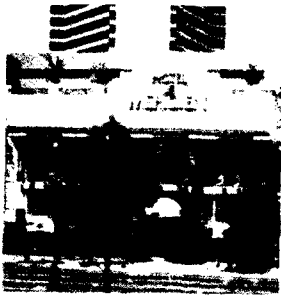
7. **HYATT REGENCY** (*\$99 single/\$99 double; government rate, \$72 single/\$72 double*): This luxury hotel features a 25-story atrium courtyard and is attached to the Louisiana Superdome and the New Orleans Centre Mall. The hotel offers free shuttles to the French Quarter, the Riverwalk, and the Aquarium of the Americas. (504) 561-1234.



8. **INTER-CONTINENTAL** (*\$100 single/\$100 double*): This four-star international style luxury hotel is only a 5- to 10-minute walk from the French Quarter and the Convention Center. Located on St. Charles Avenue, the hotel is at the center of New Orleans' business, shopping, and entertainment districts. (504) 525-5566.



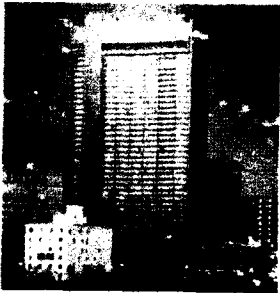
9. **ITT SHERATON NEW ORLEANS** (*\$110 single/\$120 double*): This elegant **ASM headquarters hotel** is located on Canal Street overlooking the Mississippi River and the French Quarter and just minutes from the Convention Center. The Sheraton offers three restaurants and nightly entertainment, as well as premiere health club facilities and a rooftop pool. (504) 525-2500.



10. **LE MERIDIEN** (*\$100 single/\$100 double*): This elegant French style hotel is located on Canal Street with easy access to the French Quarter and the River attractions. This four star, four diamond deluxe hotel features the Louis Armstrong Foundation Jazz Club, a full service health club, an outdoor pool, and a business center. (504) 525-6500.



11. **LE PAVILLON** (*\$89 single/\$89 double*): This old world style hotel from the age of grand hotels is just steps away from the city's nightlife and convenient to the business and cultural districts. The hotel features 220 exquisitely appointed guest rooms, a rooftop pool, and nearby fitness and spa facilities. (504) 581-3111.



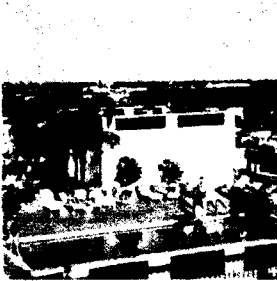
12. **MARRIOTT** (*\$105 single/\$105 double*): Located on the corner of Canal and Charles Streets in the historic French Quarter and only minutes from the Convention Center. The Marriott offers contemporary luxury in the heart of the city and features several restaurants and lounges, live entertainment, a health club, and a swimming pool. (504) 581-1000.



13. **MONTELEONE** (*\$98 single/\$98 double*): This New Orleans original is located in the heart of the French Quarter, only minutes from the famous Bourbon Street. The Monteleone presents the ambiance of old world Europe and is the largest full service hotel in the Quarter. (504) 523-3341.



14. **RADISSON SUITES** (\$110 single/\$110 double): The Radisson is located in the warehouse district, only two blocks from the Convention Center and the Riverwalk. This all-suite hotel offers beautifully appointed rooms with living areas, wet bars, refrigerators, and spacious bedrooms as well as complimentary breakfast buffet and cocktail receptions daily. (504) 525-1993.



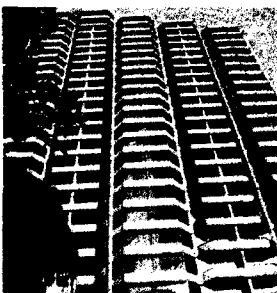
15. **OMNI ROYAL ORLEANS** (\$99 single/\$99 double): Considered to be the most luxurious hotel in the French Quarter, the Omni Royal Orleans is just one block from the famous Bourbon Street. The hotel offers the elegance and grace of traditional French-American style and features an award-winning restaurant, full service exercise facilities, and a rooftop pool and café with a spectacular view of the Mississippi River. (504) 529-5333.



16. **ROYAL SONESTA** (\$100 single/\$100 double): Located in the French Quarter, the Royal Sonesta creates an atmosphere of European elegance mixed with Southern charm. Renowned for its iron-laced balconies overlooking Bourbon Street, it encompasses almost an entire city block surrounding a tropical courtyard and pool. (504) 586-0300.



17. **WESTIN** (\$110 single/\$110 double): This elegant contemporary deluxe hotel is adjacent to the Mississippi River and the Aquarium of the Americas. The Westin is connected to the Canal Place Shopping Centre, which includes such exclusive shops as Saks Fifth Avenue, Gucci, and Ralph Lauren. All rooms feature magnificent views, marble baths, minibars, and fine European appointments. (504) 566-7006.



18. **WINDSOR COURT** (\$110 room/\$125 junior suite/\$135 full suite): Recently renovated, the Windsor is an elegant English style hotel located just blocks from the Convention Center and the French Quarter in the Central Business District. The Windsor is the first and only hotel in New Orleans to receive a AAA five diamond rating. The hotel offers unsurpassed luxury accommodations and services. (504) 523-6000.

## Information Center

The Information Center will be located in the lobby of the New Orleans Convention Center and will include the following services:

List of Registrants	Future Meetings Board
Program Changes Board	Message Center
Social Events Board	General Information Desk

The Program Changes and Additions Board and the Special Social Events Board are intended to provide last-minute and up-to-date changes to the scientific and social programs. Notices must be approved by Melissa Sordyl, Director, Meetings.

## Mail and Messages

All mail and communications to meeting registrants should be directed to the individual at the hotel where he or she is registered. Attendee locator lists will be available in the Registration area of the Convention Center beginning Wednesday, May 27. Paging service is not available at the Convention Center.

## Media Facilities

The Press Room will be located in Exhibit Hall C of the New Orleans Convention Center, under the direction of Barbara P. Hyde, Manager, Public Relations, and Dr. Penelope Hitchcock of the ASM Public Relations Committee, assisted by James Sliwa of the Public Affairs/Public Relations Office. Hours will be from 9:00 A.M. to 5:00 P.M. on Tuesday, May 26, and 8:00 A.M. to 5:00 P.M. Wednesday through Saturday. There will be daily formal press conferences. Releases on selected papers will be made available to media representatives. Interviews with authors of papers will be arranged. The Press Room phone number will be (504) 582-3124.

Questions concerning advance arrangements should be addressed to Mr. Sliwa at ASM Headquarters, 1325 Massachusetts Avenue, N.W., Washington, DC 20005-4171.

## Business Service Center

ASM will provide a business service center which will be located in the rear of Exhibit Hall A next to the Andrews-Bartlett Servicenter. The business center will be open during exhibit hours.

## International Lounge

The International Lounge will be located in Room B2 of the Convention Center. Multilingual personnel will be on hand, and international periodicals will be available. The lounge will be open during published registration hours. Light refreshments will be served.

## Placement Service

The ASM Placement Service will have its office in Exhibit Hall C at the New Orleans Convention Center during the following hours:

Tuesday, May 26.....	8:00 A.M.- 6:00 P.M.
Wednesday, May 27.....	7:00 A.M.- 5:00 P.M.
Thursday and Friday, May 28-29.....	8:00 A.M.- 5:00 P.M.
Saturday, May 30.....	8:00 A.M.-12:00 P.M.

Everyone using the on-site recruitment facilities must be registered for the meeting. Placement Service activities will be under the direction of the Placement Committee and Headquarters staff.

### *Candidates*

Microbiologists seeking employment are urged to pre-register with the Placement Service at the Washington, D.C., Headquarters prior to the **Friday, May 15** deadline. This will guarantee that their one-page Personal Data Forms are available to employers on the first day of the meeting and will make ASM members eligible for the preregistration discount. The Personal Data Form required for registration is published in the February, April, August, and December issues of the *ASM News* and on p. xxxi-xxxii of this *Program*.

Personal Data Forms **MUST BE TYPEWRITTEN**. Handwritten forms will not be accepted. **NO TYPING FACILITIES WILL BE AVAILABLE ON SITE**.

Registration for one year in the Placement Service is \$40 for ASM members and \$100 for nonmembers. An additional \$10 processing charge will be assessed to ASM members who register on site at the meeting. Proof of membership is required to obtain the member rate. Personal Data Forms will be accepted throughout the meeting. **HOWEVER**, only those forms received before **NOON** on Wednesday, May 27, will be filed in the registry books made available to prospective employers.

### *Employers*

Employers can post available positions at the meeting using special forms provided by the Placement Service. A coupon for ordering the forms appeared in the January 1992 issue of the *ASM News* on p. 56, or you may contact the Placement Service directly at (202) 737-3600, ext. 284. The fee of \$125 per posting includes the following services: Access to all of the resumes; a message service to set up appointments with prospects; and use of the interviewing facilities.

Job postings received at the Washington, D.C., Headquarters prior to the **Friday, May 15** deadline will be posted on the first day of the meeting. However, job postings will be accepted and posted throughout the meeting.

ASM Sustaining Members who do not post a position may use all of the onsite Placement facilities at no cost as a benefit of ASM corporate membership.



## Previewing Slides

Speakers may preview slides in one of the Speaker Ready Rooms, located in Rooms 11 and 84 of the New Orleans Convention Center. The rooms will be open during registration hours.

## Food Service

Food service areas in the Convention Center will be located in Exhibit Hall A, and the Atrium Restaurant/Lounge is located in the registration/lobby area.

## Coat and Bag Check Service

ASM will provide bag and coat check service at the Convention Center SATURDAY ONLY. It will be located in the registration area of the Convention Center.

## First Aid

The New Orleans Convention center operates a First Aid Service. It is located in Lobby C and Lobby F of the Convention Center. In case of emergency, pick up a house telephone and dial 0. The emergency telephone number in the ASM headquarters office at the convention center will be (504) 582-3120.

## Badge Recycling

In an attempt to be environmentally responsible, ASM continues its policy to recycle badge cases. Recycle bins will be located throughout the Convention Center. At the close of the meeting, please deposit the badge cases in these bins.

## Important Telephone Numbers

ASM Headquarters Office	(504) 582-3121
ASM Emergency number	582-3120
Press Room	582-3124
Press Room fax	582-3127
Local Committee on Arrangements	582-3128
Child Care Center (located at the Radisson)	525-1993

## Smoking

The General Meeting Program Committee has recognized the negative health implications of smoking. Its policy, therefore, is that there will be **no smoking** in the session rooms, exhibit hall, or poster session area.

## ACTIVITIES

### Opening Session



The 92nd General Meeting will open officially at 6 P.M. on Tuesday, 26 May, when the Opening Session convenes in Ballroom I of the New Orleans Convention Center. Opening ceremonies include the announcement of the Eli Lilly, Carski Foundation, Becton Dickinson, Sonnenwirth, Cetus, Abbott, and USFCC/J. Roger Porter

Awards and the ASM Award in Applied and Environmental Microbiology. The Annual ASM Lecture, supported by the Office of Naval Research, is entitled "Of Ribosomes and Volcanoes: Molecular Microbial Ecology and Submarine Hydrothermal Vents" and will be given by Norman R. Pace, University of Indiana, Bloomington.

### Opening Reception

The Opening Reception, immediately following the Opening Session, will be held at the Aquarium of the Americas. This year's reception is being supported by a grant from Roerig. ASM will provide shuttle service from the Convention Center to the Aquarium. Return service to hotels will be available after the reception.

### Presidential Address

Richard L. Crowell, Hahnemann University, Philadelphia, Pa., will present the Presidential Address, "Viruses in Receptorland," during Session 82, 4:45 P.M. on Wednesday, 27 May, in Ballroom IA of the Convention Center. The President's Bowl will be presented.

### Eli Lilly Award Address



The 1992 recipient of the Eli Lilly Award in Microbiology and Immunology, Vincent R. Racaniello, Columbia University College of Physicians and Surgeons, New York, N.Y., will present the Eli Lilly Award address during Session 167, 4:45 P.M. on Thursday, 28 May, in Ballroom IA of the New Orleans Convention Center. His lecture

topic is "Virus-Receptor Interaction in Poliovirus Entry and Pathogenesis."

### President's Forum

On Thursday, 28 May, all registrants are invited to attend the President's Forum and Reception, honoring

ASM President Richard L. Crowell. The evening will begin with the President's Forum, held in the Grand Ballroom of the Sheraton New Orleans at 8:00 P.M. The Forum will be followed at 9:00 P.M. by the gala President's Reception in the Pontchartrain Ballroom of the Sheraton.

In 1965, the New Brunswick Scientific Company instituted sponsorship of a lectureship series in conjunction with the ASM General Meeting. Lectures in this series have emphasized interdisciplinary, controversial, or philosophical aspects of subjects of general scientific interest. In 1992, the New Brunswick Scientific Company continues to support ASM through sponsorship of the President's Forum. The participants receive an honorarium and travel expenses. Selection of the speakers is made by the President of ASM, Richard Crowell, who will moderate the forum.

This year's topic will be:

"Biological Warfare: an Old Problem and Future Concerns"

with speakers:

David L. Huxsoll

Louisiana State University, Baton Rouge

Matthew S. Meselsohn

Harvard University, Cambridge, Mass.

Nancy Connell

Albert Einstein College of Medicine, Bronx, N.Y.

### President's Reception

The President's Reception, honoring ASM President Richard Crowell, will follow the President's Forum on Thursday, 28 May, at 9:00 P.M. Please join us in the Pontchartrain Ballroom of the Sheraton New Orleans. The reception will feature live musical entertainment and international coffees and desserts. Shuttle transportation back to all ASM hotels will be provided at the end of the evening.

### J. Roger Porter Award Presentation and Lecture



The award address of the U.S. Federation for Culture Collections' J. Roger Porter Award will be presented by Mary Lechevalier, Morrisville, Vt. The lecture, "Actinomycete Taxonomy: Tower of Babel?," will be presented at Session 252, Friday, 29 May, at 3:30 P.M. in Room 26 of the Convention Center.

### Sonnenwirth Memorial Lecture



of the Convention Center.

The Sonnenwirth Memorial Lecture, sponsored by Vitek Systems, Inc., will be presented by Paul D. Ellner, Columbia University College of Physicians and Surgeons, New York, N.Y. The lecture, "The Clinical Microbiologist: Past, Present, and Future," will be presented during Session 85, Thursday, 28 May, at 8:30 A.M. in Ballroom IB

### Becton Dickinson Award/Division C Lecture



A.M. in Ballroom IB of the Convention Center.

The award address of the 1992 Becton Dickinson & Company Award in Clinical Microbiology will be presented by James H. Jorgensen, University of Texas Health Sciences Center, San Antonio. The lecture, "Evolving Technology and Changing Needs in Clinical Microbiology," will be presented at Session 85, Thursday, 28 May, at 8:30

### Cetus Corporation Biotechnology Research Award



The award address of the Cetus Corporation Biotechnology Research Award will be presented by Kary B. Mullis, LaJolla, Calif. The lecture, "Polymerase Chain Reaction," will be presented at Session 252A, Friday, 29 May, at 4:45 P.M. in Room 27 of the Convention Center.

### Carski Foundation Distinguished Teaching Award



13 of the Convention Center.

The Carski Foundation Distinguished Teaching Award will be presented to Jerald C. Ensign, University of Wisconsin, Madison. The award lecture, "A Place for Bacterial Diversity in the Microbiology Curriculum: a Plea To Save an Endangered Species," will be presented during Session 294, Saturday, 30 May, at 1:30 P.M. in Room

### Scherago-Rubin Award



The recipient of the Scherago-Rubin Award, Elena Prevost-Smith, Medical University of South Carolina, Charleston, will present her paper, "The Value of Extended Agitation Incubation and Subculturing BACTEC NR 660 Resin Blood Culture Bottles for Clinical Yeast Isolates," during Session 119, Thursday, 28 May, at 10:30

A.M. in Exhibit Hall C.

### Raymond W. Sarber Fellowship Awards

The Raymond W. Sarber Fellowship Awardees are listed below and will present their papers as follows:

S.C.K. Yiu, The Hospital for Sick Children, Toronto, Ontario, Canada. "Sequence Homology between  $\alpha_2$ -Interferon Receptor and Verotoxin B Subunit." Session 29, Wednesday, 27 May, 9:00 A.M.

Christine C. Gincocchio, SUNY at Stony Brook, Stony Brook, N.Y. "Identification and Molecular Characterization of a *Salmonella typhimurium* Gene Involved in Triggering the Internalization of Salmonellae into Cultured Epithelial Cells." Session 113, Thursday, 28 May, 9:00 A.M.

Hon-Ming Lam, University of Texas Medical School, Houston. "Unusual Pleiotropic Effects of Insertion Mutations in *pxH* of *Escherichia coli* K-12." Session 293, Saturday, 30 May, 1:30 P.M.

Ping Wang, Leigh University, Bethlehem, Pa. "Analyses of Monohydroxyl Biphenyl Production from Dibenzo-thiophene by New Desulfurizing Bacteria." Session 33, Wednesday, 27 May, 10:30 A.M.

Ling-Fang Tseng, North Shore University Hospital, Manhasset, N.Y. "Rapid and Simple Antiviral Sensitivity Testing of Cytomegalovirus." Session 236, Friday, 29 May, 1:30 P.M.

### Vector Laboratories Young Investigator Travel Awards

The Vector Laboratories Young Investigator Travel Awardees are listed below and will present their papers as follows:

Sukumar Pal, University of California, Irvine. "Characterization of Neutralizable Epitope Located in the Variable Domain 3 of the Major Outer Membrane Protein of *Chlamydia trachomatis*." Session 122, Thursday, 28 May, 10:30 A.M.

David Golden, U.S. Food and Drug Administration, Washington, D.C. "Influence of Solutes, Potassium Sorbate, and Incubation Temperature on Lipid Composition of *Zygosaccharomyces rouxii*." Session 249, Friday, 29 May, 3:00 P.M.

Heidi Kaplan, University of Texas Health Science Center, Houston. "Regulation of a Signal-Dependent Gene

Expressed Early during *Myxococcus xanthus* Development." Session 192, Friday, 30 May, 9:00 A.M.

Kunal Saha, M.D. Anderson Cancer Center, Smithville, Tex. "Protective Role of CD8<sup>+</sup> T Cells In Vivo against Murine Retrovirus-Induced Neurological Disorders and Immunodeficiency Is Enhanced by the Presence of CD4<sup>+</sup> Cells." Session 57, Wednesday, 28 May, 1:30 P.M.

### Luncheon for Presidents and Secretaries of Local Branches

The South Central Branch and the Local Committee on Arrangements will host a luncheon for presidents and secretaries of local ASM branches and the officers of ASM on Wednesday, 27 May, at 11:30 A.M. in the Aurora Room of the Sheraton New Orleans. Shuttle transportation will be provided from the Convention Center.

### New Member Orientation

An orientation reception will be held for ALL new members on Tuesday, 26 May, from 4:30 to 5:30 P.M. in Rhythms, at the Sheraton New Orleans. Refreshments will be served. All new members are urged to attend and learn about the programs and services ASM has to offer. ASM Volunteers and staff from all areas will be present to answer your questions. New student members are especially welcome and encouraged to attend. Shuttle service will be provided from the Convention Center to the Sheraton.

### Branch Officers Forum

A forum for Branch Officers will be held on Wednesday, 27 May, at 9:00 A.M. in the St. Charles B Room of the Sheraton New Orleans. The primary objective of this year's Branch Forum is to foster interaction between branches. All incoming and present branch officers are invited to participate in a new format this year. Branches will form "break-out" sessions according to preselected criteria (i.e., branch geographic size, membership, etc.) to discuss common issues and concerns. Topics may include "How To Foster More Activity in Those 'Hard-To-Reach' Locations," "Strategies Branches Use To Improve Member Participation," and more if time permits. The break-out sessions will be preceded by a brief presentation by PSAB on "Legislation at the State Level." The more participants, the more informative this forum will be.

### Division Officers Forum

A meeting for all incoming and present Division Officers will be held on Thursday, 28 May, at 7:00 A.M. in the Aurora Room of the Sheraton New Orleans. Discussion

will focus upon (i) the responsibilities of the Division Officers, (ii) the role of Divisions as it relates to the ASM General Meeting Program Committee and the Committee on Divisions, (iii) ASM's strategic plan and objectives relating to Divisions, and (iv) Division fundraising. ASM hopes that all Division Chairs, Chairs-elect, Councilors, Alternate Councilors, and Divisional Group Representatives will attend.

### General Membership Meeting of ASM

The General Membership Meeting of ASM will be held from 12:00 P.M. to 1:30 P.M. on Thursday, 28 May, in Room 5 of the Convention Center. All Society members are urged to attend and take part in the discussion of Society activities and business. The officers and board chairs of the Society will be available to discuss ASM activities and answer questions. A light lunch will be available.

### Local Committee on Arrangements

The Local Committee on Arrangements will maintain an office throughout the meeting. The office will be located in the registration area of the Convention Center next to Exhibit Hall B. The telephone number will be 582-3128.

#### Local Committee on Arrangements—Executive Committee

Chairman..... GERALD DOMINGUE  
 Vice Chairman ..... RONALD LUFTIG  
 Secretary..... LUCIA CARDENAS  
 Treasurer ..... KENNETH L. BOST  
 Golf and Tennis Day..... LISET HUMAN

### Tours

All attendees and their families are invited to enjoy a variety of entertaining social, recreational, and dining activities in and around New Orleans. Please see the Guest Information brochure for details.

### Golf and Tennis Day

For information and preregistration for ASM Golf and Tennis Day, please contact Liset Human at Tulane University School of Medicine, (504) 588-5801.

### Guest Hospitality Center

The Guest Hospitality Center will be located in the Radisson Suites Hotel. Board games, newspapers, and

other publications will be available for attendees to use with their families. The Radisson Suites Hotel is one block from the Convention Center.

### Child Care Center

The Child Care Center will be located in the Diamond Room of the Radisson Suites Hotel, located one block from the Convention Center. Please see the Guest Information brochure for more details.

## EXHIBITS

### Technical Exhibits

Technical exhibits will be located in the New Orleans Convention Center Exhibit Halls A and B.

Representatives of exhibiting companies will display their products, give demonstrations, and discuss applications of their products. Each person attending the General Meeting is urged to visit the exhibit area and become familiar with the latest in apparatus, supplies, and books.

The exhibits will be open from 8:30 A.M. to 5:00 P.M. on Wednesday, Thursday, and Friday; consult the exhibits program available at the meeting for booth numbers of exhibiting companies. The following companies have reserved exhibit space as of February 10 (asterisk indicates sustaining member):

- \*Abbott Laboratories
- Academia Book Exhibits
- Academic Press, Inc.
- \*Adams Scientific, Inc.
- Ahlstrom Filtration, Inc.
- Alamar Biosciences, Inc.
- \*Alexon, Inc.
- Ambion, Inc.
- Ambis, Inc.
- Amerex Instruments, Inc.
- American Qualex Immunology & Molecular Biology Reagent Co.
- American Type Culture Collection (ATCC)
- Amicon Division, W.R. Grace & Co., Conn.
- Analytab Products
- Analytical Luminescence Laboratory
- \*Applied Biosystems, Inc.
- Applied Imaging Corporation
- Association of State & Territorial Public Health Laboratory Directors
- Associates of Cape Cod, Inc.
- Astra Pharmaceutical Products, Inc.
- AutoMed Awareness Technology, Inc.
- \*AB Biodisk, North America, Inc.
- ADI Diagnostics Inc.
- ALPHA-TEC Systems, Inc.
- AMRESO Inc.
- \*AMSCO/American Sterilizer Company

- \*Anaerobe Systems
  - B. Braun Biotech, Inc.
  - Barnstead/Thermolyne Corporation
- \*Baxter Diagnostics, Microscan, Bartels, and Scientific Products
- \*Becton Dickinson and Company
  - Benjamin/Cummings Publishing Company
  - The Binding Site
  - Bio-Medical Products Corp.
  - Bio-Synthesis Inc.
  - Bio-Tek Instruments Inc.
  - Bioengineering AG
  - Biokit USA Inc.
- \*Biolog, Inc.
  - Biomedical Products
  - Bionique Testing Laboratories, Inc.
  - Biotest Diagnostics Corporation
  - BioLab Associates
- \*BioMerieux Vitek, Inc.
  - BioStar Medical Products, Inc.
  - BioTechniques/Eaton Publishing
- \*BioWhittaker, Inc. (formerly Whittaker Bioproducts, Inc.)
  - Blackwell Scientific Publications, Inc.
  - Boehringer Mannheim
  - Boeing Defense & Space Group
  - Boekel Industries, Inc.
- \*Brinkman Instruments, Inc.
  - Burroughs Wellcome Co.
- \*The Baker Company
  - Bel-Art Products
- \*Bellco Glass, Inc.
  - BINAX, Inc.
  - Bio-Rad Laboratories
  - C-GEM Biomedical
  - Carlson Scientific Inc.
- \*Carr-Scarborough Microbiologicals, Inc.
  - Cell Press
  - Chapman and Hall
  - Chemicon International, Inc.
- \*Chrisope Technologies, Inc.
  - Cold Spring Harbor Laboratory Press
  - Columbus Instruments International
  - Corning Incorporated
  - Council for Responsible Genetics, Inc.
  - Coy Laboratory Products
  - Cambridge Biotech Corporation
  - CHEMAP, Inc.
- \*Costar Corporation
  - CRC Press, Inc.
- \*Deltown Specialties
- \*Denley Instruments, Inc.
  - Diagnostic Products Corporation
- \*Difco Laboratories
  - Digene Diagnostics, Inc.
  - Drummond Scientific Company
- \*Du Pont
  - Dako Corporation
  - DBM Scientific Corp.
  - Diamedix Corporation
  - DNASTAR, Inc.
  - Dynochrom Inc.
- \*Eastman Kodak Company
  - Eberbach Corporation
  - Elkay Labsystems
  - Elsevier Science Publishing Co., Inc.
  - Epic Systems Corporation
  - Evergreen Scientific
  - ECOMED, Inc.
  - EG&G Berthold
- \*EM Diagnostic Systems
  - Encyclopaedia Britannica North America
  - Environetics, Inc. (formerly Access)
  - EY Laboratories, Inc.
  - Fisher Scientific
- \*Forma Scientific, Inc.
  - FMC BioProducts
- \*Fotodyne Incorporated
  - FTS Systems, Inc.
  - Gelman Sciences
  - Genemed Biotechnologies, Inc.
  - General Valve Corporation
- \*Glaxo Pharmaceuticals, Div. of Glaxo Inc.
  - Granbio, Inc.
  - Gull Laboratories, Inc.
- \*Gen-Probe Incorporated
  - Hach Company
  - Harris Manufacturing
  - Hitachi Software Engineering America, Ltd.
- \*Hoechst-Roussel Pharmaceuticals, Inc.
  - Hoefer Scientific Instruments
  - Hotpack Corp.
  - HyClone Laboratories, Inc.
  - Helix Diagnostics, Inc.
  - Immuno Concepts, Inc.
  - Immuno-Mycologies, Inc.
  - Institute for Scientific Information
- \*Institutes for Microbiology Research
- \*Integrated Diagnostic, Inc.
  - IntelliGenetics, Inc.
  - Intergen Company
  - International Biotechnologies, Inc.
  - International BioProducts Inc.
  - International Mycoplasma
  - International PBI, S.P.A.
  - IAF BioChem International Inc.
  - IGEN, Inc.
- \*Innovative Diagnostic Systems, Inc.
  - INOVA Diagnostics, Inc.
  - J.B. Lippincott Company
  - J.T. Baker Inc.
  - Jackson ImmunoResearch Laboratories, Inc.
  - Jandel Scientific

John Wiley & Sons  
 Jordon Scientific Products  
 Jouan, Inc.  
 Journal of NIH Research  
 The Key Scientific Products  
 Keyboard Publishing  
 Kimberly-Clark Corporation  
 Kirkegaard & Perry Laboratories, Inc.  
 \*Lab-Line Instruments, Inc.  
 Labconco Corporation  
 Labindustries, Inc.  
 \*Leica, Inc.  
 List Biological Laboratories, Inc.  
 LI-COR, Inc.  
 Marcor Development Corp./Universal Foods  
 Marsh Biomedical Products, Inc.  
 McGraw-Hill, Inc. College Division  
 Medi-Flex Hospital Products, Inc.  
 Medical Interviews Div. of Hosp. Research  
 \*Medical Wire and Equipment  
 Meridian Instruments, Inc.  
 \*Microbiology Reference Laboratory (MRL)  
 Microbiology Specialists Inc.  
 Microprobe Corporation  
 Miles Inc., Pharmaceutical Division  
 \*Millipore Corporation  
 Mosby-Year Book, Inc.  
 Murex Corporation  
 Manostat Corporation  
 Marcel Dekker, Inc.  
 Matrix Technologies Corp.  
 Medical Packaging Corporation  
 Mediquip, Inc.  
 \*Meridian Diagnostics, Inc.  
 MIDI  
 MLO/CLR-Medical Laboratory Observer  
 \*MSI/Micro Media Systems  
 Nasco Whirl-Pak  
 National Center for Research Resources, NIH  
 National Library of Medicine/NCBI  
 National Foundation for Infectious Diseases  
 National Research Council/NAS  
 Nature Publishing Co.  
 \*New Brunswick Scientific  
 New England Biolabs  
 New Horizons Diagnostics Corp.  
 Nikon Inc., Instrument Group  
 Nor-Lake Scientific  
 North American Laboratory Group  
 \*NuAire, Inc.  
 National Biosciences, Inc.  
 Omni International, Inc.  
 \*Organon Teknika  
 \*Ortho Diagnostic Systems, Inc.  
 Owl Scientific Plastics, Inc.  
 Oxford Labware (div. of Sherwood Medical)  
 Olympus Corporation  
 \*ORTHO/McNeil Pharmaceutical  
 \*Pacific Biotech, Inc.  
 \*Panlabs, Inc.  
 Peninsula Laboratories, Inc.  
 Perkin Elmer Cetus  
 \*Pfizer Labs.  
 \*Pfizer, Inc.  
 Pharmacia Diagnostics Div.  
 Pharmacia Biosystems, Inc.  
 \*Pharmacia LKB Biotechnology  
 Plenum Publishing Corporation  
 Polyfoam Packers Corporation  
 Polysciences, Inc.  
 Poretics Corporation  
 Prentice Hall  
 \*Pro-Lab Diagnostics  
 Promega Corporation  
 PB Diagnostic Systems, Inc.  
 PDI  
 \*Quest International, Inc., Sheffield Products Division  
 QUIDEL Corporation  
 \*Radiometer America Inc./Sensititre Systems Group  
 \*Rainin Instrument Company  
 Raven Biological Laboratories, Inc.  
 RepliGen Corporation  
 Research Organics, Inc.  
 Research Products International Corp.  
 \*Revco Scientific, Inc.  
 Robbins Scientific Corporation  
 Roche Diagnostic Systems  
 \*Roche Laboratories  
 \*Roerig, a division of Pfizer  
 \*Rupp and Bowman Co.  
 Ramco Laboratories, Inc.  
 \*REMEL  
 \*Sanofi Diagnostics Pasteur  
 Sarstedt, Inc.  
 Sartorius Corporation  
 Savant Instruments, Inc.  
 \*Savyon Diagnostics Ltd.—HQ & Mktg.  
 \*Schleicher & Schuell  
 Science/Electronics  
 Scientemp Corp.  
 SciMedx Corporation  
 Seradyn, Inc.  
 Serologicals, Inc.  
 Shimadzu Scientific Instruments, Inc.  
 \*Sigma Cell Culture  
 Sigma Diagnostics  
 Silk Scientific, Inc.  
 \*SmithKline Beecham Pharmaceuticals  
 SoloHill Labs, Inc.  
 Southern Research Institute  
 Spiral System Instruments, Inc.  
 Springer-Verlag New York, Inc.  
 Squibb U.S. Pharmaceutical Division  
 Starplex Scientific

\*Sulzer Biotech Systems  
 Sunquest Information Systems, Inc.  
 \*Syva Company  
 SAFESKIN  
 SAMCO  
 SCIENCE Magazine  
 Scientific Device Laboratory, Inc.  
 Shamrock Scientific Specialty, Inc.  
 SLT Labinstruments  
 Sonics & Materials, Inc.  
 Stovall Life Science, Inc.  
 \*T Cell Diagnostics, Inc.  
 Takara Biochemical Inc.  
 Technology for Medicine, Inc.  
 Tekmar Company  
 Tomtec, Inc.  
 Tomy Tech USA, Inc.  
 Trend Scientific, Inc.  
 Tropix, Inc.  
 TAGO, Inc.  
 TECAN  
 U.S. Federation for Culture Collections  
 United States Biochemical Corporation  
 \*Unipath-Oxoid Division  
 USA Scientific Plastics, Inc.  
 Vestec Corporation  
 Viomed Laboratories, Inc.  
 The Virtis Company  
 \*Vanguard International, Inc.  
 VIRION (U.S.), Inc.  
 W.B. Saunders Company  
 W.H. Freeman and Company  
 \*Wampole Laboratories  
 Wheaton  
 Wescor, Inc.  
 \*Williams & Wilkins  
 Worthington Biochemical Corporation  
 Zymed Laboratories, Inc.  
 \*3M Health Information Systems

### Scientific Exhibits

The scientific exhibits will be located adjacent to the technical exhibits in the Exhibit Hall and will be open during regular exhibit hours. A description of these exhibits will be included in the exhibits program.

## AMERICAN ACADEMY OF MICROBIOLOGY PROGRAMS

Information on Fellowship in the American Academy of Microbiology; Awards; certification through the Certification Board of the National Registry of Microbiologists, the American Board of Medical Microbiology, and the American Board of Medical Laboratory Immunology;

and accreditation of postdoctoral training programs in microbiology and immunology by the Committee on Postdoctoral Education Programs will be available at a booth located in the registration area of the New Orleans Convention Center.

## DOCUMENTATION OF MEETING ATTENDANCE FOR CATEGORY 1 CONTINUING MEDICAL EDUCATION

The American Society for Microbiology is accredited by the Accreditation Council for Continuing Medical Education (ACCME) as a sponsor of Category 1 continuing medical education (CME). Attendance at all symposia, seminars, round table sessions, and divisional and award lectures is eligible for credits. Paper and poster sessions are NOT eligible for credit. Eligible sessions are indicated in the program under the session title.

Physicians, Diplomates, and Registrants seeking recognition or recertification with The Physician's Recognition Award (PRA), American Board of Medical Microbiology (ABMM), American Board of Medical Laboratory Immunology (ABMLI), or National Registry of Microbiologists (NRM) may apply these credits. ASM is not accredited by any nursing or pharmacy association. Additionally, ASM is not accredited by the State of Louisiana or any other state.

To obtain this service, indicate your selection on the *Meeting Registration Form*. Once your registration has been processed, you will be mailed the appropriate forms. The Society will no longer offer a separate desk for verification. This service has been incorporated into the Meeting Registration.

After the meeting, the bottom copy of the Certificate of Attendance as well as the Participant Evaluation may be returned to the black Drop-Off boxes in the registration area or by mail within 2 weeks after the meeting. The Society is not responsible for forms which are incomplete, incorrect, or submitted after the 2-week deadline date. All forms which are incomplete, do not contain the correct information, or are received after the deadline date cannot be processed and will be returned. There is a nonrefundable \$10 fee for the service.

## WORKSHOPS

### General Information

The Committee on Continuing Education, Board of Education and Training, is pleased to announce the 1992 Workshop Program, 29 and 30 May, to be held at the Sheraton New Orleans. All of the workshops are pending approval for category 1 medical education (CME) credits. Individuals who wish credits must register, sign in, and successfully complete the workshop.

## Registration

Individuals are urged to complete and forward the registration form as soon as possible. Receive a 25% discount when you register by 29 April 1992 (see early registration fee). Registration must be postmarked on or before this date to be charged at the lower rate.

### *How To Register*

#### *Mail*

Send:

1. Completed registration form
2. Registration fee (payable to ASM)
3. ONE self-addressed mailing label to Workshop Coordinator, ASM, 1325 Massachusetts Ave., N.W., Washington, D.C. 20005. Incomplete forms or forms sent without the proper payment will be returned. Registration forms received after 29 April will be returned for on-site registration in New Orleans.

#### *Telephone*

Telephone registration is only available to individuals who wish to pay the registration fee with a valid VISA, MasterCard, or American Express account.

1. Fill out the registration form (to ensure accuracy).
2. Call the workshop coordinator at (202) 737-3600.
3. Read from the registration form to the workshop coordinator.
4. Have the credit card number and expiration date available.

There is a nonrefundable 7% charge for credit card service.

#### *On-Site Registration*

If you cannot register for a workshop before 29 April, you have the opportunity to register for the workshop onsite. On-site registration will be accepted on a first-come, first-served basis and will be charged at the higher, on-site fee. On-site registration will be available at the Workshop Registration Desk, Sheraton New Orleans Hotel, Friday, 29 May, from 7:30 A.M. to 5:00 P.M., and Saturday, 30 May, from 7:30 A.M. to 12:00 P.M., and only for workshops which have not filled to capacity or been cancelled. Workshops may fill to capacity or be cancelled without prior notice.

To take advantage of the member rate, individuals must be active 1992 ASM members.

#### *Cancellations*

Individuals who wish to cancel out of a workshop on or before 29 April may receive a full refund, minus a \$25 handling fee. Those who cancel after this date are not entitled to any refund.

## WORKSHOP ORIENTATION PROGRAM

A workshop orientation program for individuals who want to assist with the Society's workshop activities has been scheduled for Thursday, 28 May, from 12:00 P.M. to 1:00 P.M. in Room 89 of the Convention Center. During this session individuals will learn about the overall responsibilities of a workshop organizer. The workshop organizer serves as a liaison between the workshop faculty members and the Committee on Continuing Education of the Board of Education and Training. Approximately 50 workshops are presented to the Committee annually.

We encourage you to get involved; contribute your expertise to the Society's workshop programs. You do not need to register for the orientation program....just come, bring a lunch and a friend. Cold refreshments will be available.

## TEACHING MATERIALS PRESENTATIONS

The Board of Education and Training will host the third annual Teaching Material Exchange in Room 90 of the New Orleans Convention Center, on Thursday, 28 May, from 11:00 A.M. to 3:00 P.M. The Exchange provides a forum for undergraduate faculty participants to demonstrate their teaching innovations and describe their usefulness in the classroom.

Innovations include computer software programs, videotapes, videodiscs, tutorials, models, transparencies, slides, audiotapes, and other visual, audio, or electronic programs. Participants will gain insight on the creative methods used to teach microbiology.

An informal focus group meeting will be conducted after the program that will address ways to improve ASM's role in undergraduate education.

For more information, including a schedule for the presentations, please refer to the Board of Education and Training booth in the convention center.

## AUDIOTAPING OF SELECTED WORKSHOPS AND SESSIONS

The Committee on Educational Materials of the Board of Education and Training is pleased to announce the sale of audiocassette tapes from selected workshop presentations and General Meeting sessions. Order forms will be available at the Audiocassette Sales Booth located in the registration area of the convention center. Tapes will be available 2 hours after the end of the session taped and will remain on sale through the week of the General Meeting. Tapes may also be ordered through the mail after the meeting. Place your orders early to avoid delays at the end of the week. All sessions being audiotaped are denoted by a cassette symbol next to the session title.



## EDUCATIONAL PRODUCTS AND SERVICES

Materials on career information, resources for scientists who volunteer in the classroom, programs for undergradu-

ate faculty and students, workshops, audioconferences, the Coalition for Education in the Life Sciences, and the Latin American Professorship Program will be available at the Board of Education and Training booth in the registration area of the convention center.

## DIVISIONAL BUSINESS MEETINGS

The Society's divisions will hold their annual business meetings as noted below. Both the current chair and chair-elect will be present to conduct and plan the business of the divisions. All meetings will be held at the Convention Center.

Group	Division		Day, Time, and Location
I	Antimicrobial Chemotherapy (A)		
	<i>Chair:</i>	Dwight J. Hardy	Friday, 29 May, 12:45 P.M., Room 13
	<i>Chair-elect:</i>	Raymond T. Testa	
	Microbial Pathogenesis (B)		
	<i>Chair:</i>	Alan Barbour	Thursday, 28 May, 12:45 P.M., Room 19
	<i>Chair-elect:</i>	Janne G. Cannon	
	General Medical Microbiology (D)		
	<i>Chair:</i>	Gerald Byrne	Thursday, 28 May, 12:45 P.M., Room 1
	<i>Chair-elect:</i>	Steven J. Norris	
	Immunology (E)		
<i>Chair:</i>	Toby K. Eisenstein	Friday, 29 May, 12:45 P.M., Room 2	
<i>Chair-elect:</i>	Chris E. Taylor		
II	Mycoplasmology (G)		
	<i>Chair:</i>	Kevin F. Dybvig	Friday, 29 May, 12:45 P.M., Room 19
	<i>Chair-elect:</i>	Leigh R. Washburn	
	Mycobacteriology (U)		
	<i>Chair:</i>	Josephine Clark-Curtiss	Friday, 29 May, 12:45 P.M., Room 85
	<i>Chair-elect:</i>	Thomas M. Daniel	
	Genetics and Molecular Biology (H)		
	<i>Chair:</i>	Thomas J. Silhavy	Friday, 29 May, 11:30 A.M., Room 43
	<i>Chair-elect:</i>	Anne O. Summers	
	General Microbiology (I)		
<i>Chair:</i>	Jeanne S. Poindexter	Thursday, 28 May, 11:30 A.M., Room 36	
<i>Chair-elect:</i>	Robert P. Gunsalus		
Morphology and Ultrastructure (J)			
<i>Chair:</i>	Susan F. Koval	Thursday, 28 May, 12:45 P.M., Room 39	
<i>Chair-elect:</i>	John W. Costerton		
Microbial Physiology and Metabolism (K)			
<i>Chair:</i>	Judy Wall	Thursday, 28 May, 11:30 A.M., Room 41	
<i>Chair-elect:</i>	Stephen J. Mattingly		
Bacteriophage Biology (M)			
<i>Chair:</i>	Peter B. Berget	Friday, 29 May, 12:45 P.M., Room 38	
<i>Chair-elect:</i>	William T. McAllister		
Systematic and Evolutionary Microbiology (R)			
<i>Chair:</i>	David Stahl	Friday, 29 May, 11:30 A.M., Room 37	
<i>Chair-elect:</i>	Cletus P. Kurtzman		

III	Aquatic and Terrestrial Microbiology (N)		
	<i>Chair:</i>	Roy M. Ventullo	Thursday, 28 May, 11:30 A.M., Room 33
	<i>Chair-elect:</i>	Aaron L. Mills	
	Fermentation Microbiology (O)		
	<i>Chair:</i>	Burton M. Pogell	Thursday, 28 May, 12:45 P.M., Room 80
	<i>Chair-elect:</i>	Linda L. Lasure	
	Food Microbiology (P)		
	<i>Chair:</i>	Peggy M. Foegeding	Thursday, 28 May, 12:45 P.M., Room 97
	<i>Chair-elect:</i>	J. Stan Bailey	
	Environmental and General Applied Microbiology (Q)		
	<i>Chair:</i>	Christon J. Hurst	Wednesday, 27 May, 12:45 P.M., Room 97
	<i>Chair-elect:</i>	Donna L. Bedard	
IV	*DNA Viruses (S)		
	<i>Chair:</i>	Dennis O'Callaghan	Friday, 29 May, 11:00 A.M., Room 93
	<i>Chair-elect:</i>	Mark F. Stinski	
	*RNA Viruses (T)		
	<i>Chair:</i>	Mary K. Estes	Friday, 29 May, 11:00 A.M., Room 93
	<i>Chair-elect:</i>	Michael M. C. Lai	
	*Joint Division S and T meeting		
V	Clinical Microbiology (C)		
	<i>Chair:</i>	Mary J. Gilchrist	Thursday, 28 May, 12:45 P.M., Ballroom IB
	<i>Chair-elect:</i>	Stephen G. Jenkins	
	Medical Mycology (F)		
	<i>Chair:</i>	Garry T. Cole	Thursday, 28 May, 12:45 P.M., Room 26
	<i>Chair-elect:</i>	David A. Stevens	
	Nosocomial Infections (L)		
	<i>Chair:</i>	Bryan P. Simmons	Wednesday, 27 May, 12:45 P.M., Room 33
	<i>Chair-elect:</i>	Robert A. Weinstein	
	Diagnostic Immunology (V)		
	<i>Chair:</i>	Ronald J. Harbeck	Thursday, 28 May, 12:45 P.M., Room 13
	<i>Chair-elect:</i>	Anne L. Jackson	

## PROFESSIONAL AND EDUCATIONAL SESSIONS

*Cholera* (Sponsored by the American Academy of Microbiology), Session 4, Wednesday, 8:30 A.M., Room 90, Convention Center.

*What Should the Microbiology Laboratory Course Accomplish?* (Sponsored by the Board of Education and Training), Session 9, Wednesday, 8:30 A.M., Room 103, Convention Center

*Update '92 I: Regulatory T Lymphocytes* (Sponsored by the Board of Education and Training), Session 43, Wednesday, 12:00 P.M., Room 103, Convention Center

*Critical Thinking or Problem Solving Skills* (Sponsored by the Board of Education and Training), Session 50, Wednesday, 1:30 P.M., Room 103, Convention Center

*Microbiology: Food and Water Quality Concerns in Developing Countries* (Sponsored by the Board of Public and Scientific Affairs and the American Academy of Microbiology), Session 62, Wednesday, 1:30 P.M., Room 95, Convention Center

*Microbiology Education: Elementary School through College* (Sponsored by the Board of Education and Training), Session 91, Thursday, 8:30 A.M., Room 103, Convention Center

*Molecular Biology and Biochemistry of Acidophilic Chemolithotrophs: Applications on Bacterial Leaching of Ores* (Sponsored by the Board of Public and Scientific Affairs), Session 101, Thursday, 8:30 A.M., Room 95, Convention Center

*Unsolved Problems in the Teaching of Microbiology* (Sponsored by the Board of Education and Training), Session

- 132, Thursday, 1:30 P.M., Room 103, Convention Center
- The Discovery Process* (Sponsored by the Board of Public and Scientific Affairs), Session 138, Thursday, 1:30 P.M., Room 85, Convention Center
- Incorporating Virology into the Undergraduate Microbiology Curriculum* (Sponsored by the Board of Education and Training), Session 176, Friday, 8:30 A.M., Room 103, Convention Center
- Science Literacy: a Fable for Our Time* (Sponsored by the Board of Education and Training), Session 189, Friday, 8:30 A.M., Room 95, Convention Center
- Regulatory and Legislative Perspective for Clinical Microbiologists: STATNET—What Is It? How Do I Get Involved?* (Sponsored by the Board of Public and Scientific Affairs), Session 190, Friday, 8:30 A.M., Room 97, Convention Center
- Scarlet Fever, Septic Scarlet Fever, Toxic Fever, and the Streptococcal Toxic Shock Syndrome* (Sponsored by the Center for the History of Microbiology), Session 209, Friday, 11:00 A.M., Room 100, Convention Center
- Update '92 II: Bacterial Pathogenesis* (Sponsored by the Board of Education and Training), Session 210, Friday, 12:00 P.M., Room 103, Convention Center
- Microbiologists and Mentors: Responsibilities and Rewards* (Sponsored by the Board of Public and Scientific Affairs), Session 226, Friday, 1:30 P.M., Room 80, Convention Center
- Using History To Enrich the Teaching of Microbiology* (Sponsored by the Board of Education and Training), Session 229, Friday, 1:30 P.M., Room 95, Convention Center
- Discovering Your Role in Precollege Science Education* (Sponsored by the Board of Education and Training), Session 216, Friday, 1:30 P.M., Room 103, Convention Center
- Cross-Infection: Risks in Dentistry* (Sponsored by the American Academy of Microbiology), Session 256, Saturday, 8:30 A.M., Room 14, Convention Center
- Agarose Gel Electrophoresis of DNA for the Teaching Laboratory* (Sponsored by the Board of Education and Training), Session 262, Saturday, 8:30 A.M., Room 42, Convention Center
- New Directions in Undergraduate Education* (Sponsored by the Board of Education and Training), Session 263, Saturday, 8:30 A.M., Room 13, Convention Center
- Update '92 III: Microbial Density* (Sponsored by the Board of Education and Training), Session 288, Saturday, 12:00 P.M., Room 13, Convention Center
- Innovative Strategies for Teaching Microbiology* (Sponsored by the Board of Education and Training), Session 294, Saturday, 1:30 P.M., Room 13, Convention Center

## 1992 GENERAL MEETING WORKSHOPS

The workshop schedule, faculty, and topics are subject to change without notice.

All workshops will be held at the Sheraton New Orleans Hotel, 500 Canal Street, New Orleans, LA 70130.

### W1. Plasmids in the Environment: Detection, Recovery, and Amplification Techniques

(Eligible for 6 Category 1 CME credits)

Saturday, 8:30 A.M. (full day), Sheraton New Orleans

*Faculty:* MONICA A. DEVANAS, Rutgers, The State University, New Brunswick, N.J.; RONALD M. ATLAS, University of Louisville, Louisville, Ky; MICHAEL A. GEALT, Drexel Univ., Philadelphia, Pa.; JOHN H. PAUL, Univ. of South Florida, St. Petersburg; and ROBERT E. SJOGREN, Univ. of Vermont, Burlington.

*Audience:* The 1-day lecture workshop is directed to individuals interested in environmental sampling who desire to learn about the new molecular methods being implemented in these areas. It is necessary for the participants to have some basic knowledge of microbial ecology and molecular biology methods.

*Topics:*

- Recovery and amplification of DNA from the environment
- Detection of plasmids in soil and groundwater microbiota
- Plasmids and DNA in seawater: detection and transformation
- Plasmids in sewage sludge and effluent

*Objectives:* At the completion of the program the participants will be knowledgeable in the possibilities and problems of applying molecular techniques to environmental studies. They will have ample time to discuss particular problems with the faculty regarding their own areas of interest.

### W2. Proven and Emerging Techniques in Bioremediation

(Eligible for 7.5 Category 1 CME credits)

Saturday, 8:00 A.M. (full day), Sheraton New Orleans

*Faculty:* ANTHONY V. PALUMBO, Oak Ridge Nat. Lab., Oak Ridge, Tenn.; BURT ENSLEY, Envirogen, Inc., Mercerville, N.J.; MIKE NELSON, Ecova Corp., Redmond, Wash.; TERRY HAZEN, Savannah River Site, Aiken, S.C.; and PAUL SUTTON, Sutton & Associates, Bethel, Conn.

*Audience:* This 1-day workshop is directed to microbiologists and engineers who are interested in increasing their general knowledge of applied environmental applications of microbiology and are interested in potential research opportunities in relationship to emerging biological treatment techniques.

*Topics:*

- Scope of problems and technologies
- Proven technologies involving nutrient stimulation and bioreactors
- Bioaugmentation
- Use of genetically engineered microorganisms

*Objectives:* At the completion of the program the participants will be knowledgeable in the techniques currently being used for in-situ and ex-situ bioremediation and will gain an awareness of developing techniques and associated research opportunities. The goal will be to increase the level of awareness of opportunities for microbial applications in remediation activities.

### W3. Laboratory Biotreatability Studies: Designs, Performance, and Evaluation

(Eligible for 5.25 Category 1 CME credits)

Saturday, 8:00 A.M. (full day), Sheraton New Orleans

*Faculty:* GEORGE SKLADANY, Envirogen Princeton Res. Ctr., Lawrenceville, N.J.; CAROL D. LITCHFIELD, Environmental Technology Applications, Lawrenceville, Pa.; and KATHERINE BAKER, Environmental Microbiology Associates, Harrisburg, Pa.

*Audience:* This 1-day lecture program is directed to individuals who are responsible for developing laboratory biotreatability studies on microbial degradation of hazardous or toxic wastes. Persons who must evaluate such studies will also profit from learning what constitutes a good study versus incomplete studies. It is assumed that participants will have some knowledge of basic microbiology and experimental procedures.

*Topics:*

- Biotreatability studies: problem definition
- Biotreatability studies: project objectives
- Experimental strategies
- Aerobic/anaerobic experimental design
- Experimental methodologies and equipment
- Qualitative and statistical data interpretation
- Proposed EPA biotreatability protocols
- Oil spill biotreatability evaluation protocols

*Objectives:* At the completion of the program, the participants will be knowledgeable about the design requirements for laboratory treatability studies, their limitations, and how to evaluate them statistically and determine the reliability of the test results.

### W4. Aquatic Viral Technology

(Eligible for 5.5 Category 1 CME credits)

Friday, 8:30 A.M. (full day), Sheraton New Orleans

*Faculty:* JOHN H. PAUL, Univ. of South Florida, St. Petersburg; JED FUHRMAN, USC, Los Angeles, Calif.; ROBERT MILLER, Oklahoma State Univ., Stillwater; CURTIS SUTTLE, Univ. of Texas at Austin, Port Arkansas; FAROOQ AZAM, Scripps Inst. of Oceanography, La Jolla, Calif.; JOHN WATERBURY, Woods Hole Oceanographic Inst., Woods Hole, Mass.; TREVOR BEEBEE, Univ. of Sussex, Falmer Brighton, United Kingdom; and KNUT BORSHEIM, Univ. of Trondheim, Trondheim, Norway.

*Audience:* This 1-day lecture workshop with demonstration is directed to individuals versed in the basic techniques of aquatic microbiology who are interested in the recently developed

## 1992 GENERAL MEETING WORKSHOPS

methodology for concentration, enumeration, and general techniques for working with aquatic viruses.

### Topics:

- Ecological significance of viruses and bacteria
- Viral concentration devices
- Ecological significance of viruses and phytoplankton
- Genetic significance of viruses

**Objectives:** At the completion of the program the participants will be knowledgeable about the various technologies employed for working with natural populations of viruses. They will also have the ability to establish viral research techniques for their own laboratories.

### W5. Preservation, Quality Assurance, and Validation in Cosmetic Microbiology

*(Eligible for 6.0 Category 1 CME Credits)*

Friday, 8:30 A.M. (full day), Sheraton New Orleans

**Faculty:** DANIEL K. BRANNAN, Abilene Christian Univ., Abilene, Tex.; PATRICIA BOOTH, Ortho Pharmaceutical Corp., Raritan, N.J.; and GAYLE BOROVIAN, Johnson and Johnson, Skillman, N.J.

**Audience:** The 1-day lecture workshop is directed to the product development microbiologist responsible for preservative selection and to the quality assurance manager in the cosmetics industry.

### Topics:

- Preservation and quality assurance testing: FDA concerns and perceptions
- Preservative challenge testing: methods available
- Quality assurance maintained: good housekeeping, sanitizing, attitudes
- Quality assurance testing: validation of microbial content testing
- Validation concepts in preservative efficacy testing

**Objectives:** At the completion of the program, participants will be knowledgeable about the importance of preservative selection, the methods available for preservative and quality assurance testing, and the importance of validation in these two areas.

### W6. Development of Critical Thinking Skills in the Microbiology Curriculum: Remodeling the Course

*(Eligible for 6.75 Category 1 CME credits)*

Saturday, 8:00 A.M. (full day), Sheraton New Orleans

**Faculty:** JUDITH KANDEL, California State Univ., Fullerton, and DANIEL BURKE, Seton Hall Univ., South Orange, N.J.

**Audience:** The 1-day lecture workshop is directed to informing undergraduate teaching faculty in the use of critical thinking activities as a central component in the format of their course(s). It is intended for undergraduate faculty teaching introductory-level microbiology to biology or allied health majors at the community college, 4-year college, or university level.

### Topics:

- Introduction to critical thinking

- Critical analysis of the microbiology course
- Critical thinking in lectures and discussions
- Critical thinking in the laboratory
- Evaluation techniques
- Identifying and overcoming difficulties in changing the course

**Objectives:** At the completion of the workshop the participants will be knowledgeable about identifying key lecture and laboratory concepts and topics for their course(s). They will become familiar with the use of pedagogical techniques that stimulate critical thinking skills. Such techniques include Socratic questioning, problem solving, collaborative learning, critical reading, and writing. They will also develop a series of critical thinking activities for lecture and discussion, laboratory, and individual assignment.

### W7. Disinfectants Testing I: Current Topics in the Evaluation of Disinfectants and Antiseptics

*(Eligible for 7.0 Category 1 CME credits)*

Friday, 8:00 A.M. (full day), Sheraton New Orleans

**Faculty:** SCOTT V. W. SUTTON, Rochester, N.Y.; GAYLE MULBERRY, Hilltop Res., Cincinnati, Ohio; GEORGE LAVELL, ViroMed, Minnetonka, Minn.; J. M. ASCENZI, Johnson & Johnson Med., Inc., Arlington, Tex.; and DAVID A. PORTER, Bausch & Lomb, Inc., Rochester, N.Y.

**Audience:** This 1-day lecture workshop with demonstration is directed to individuals with a basic knowledge of microbiology and statistics who are interested in learning about the current methods used for evaluation of disinfectants and antiseptics as well as the relevant EPA and FDA protocols.

### Topics:

- Introduction and overview of active agents
- Regulatory control of antiseptics and disinfectants
- Test methods for bacterial and viral disinfectants
- Test methods for antiseptics
- Methods for the evaluation of neutralizers
- Alternatives for the evaluation of neutralizers
- Contact lens methodology

**Objectives:** At the completion of this program the participants will be knowledgeable in their understanding of methods used to evaluate disinfectants and antiseptics.

### W8. Disinfectant Testing II: a New Age in Disinfectant Testing: New Tests and Good Laboratory Practice

*(Eligible for 7 Category 1 CME credits)*

Saturday, 8:00 A.M. (full day), Sheraton New Orleans

**Faculty:** MARY K. BRUCH and DONNA SUCHMANN, MicroBioTest, Inc., Chantilly, Va.; DAN BRANNAN, Abilene Christian Univ., Abilene, Tex.; BONNIE BASKIN, ViroMed Lab., Inc., Minnetonka, Minn.; and JOSEPH RUBINO, Lehn and Fink, Montvale, N.J.

## 1992 GENERAL MEETING WORKSHOPS

**Audience:** This 1-day lecture workshop is directed at individuals involved in disinfectant and other antimicrobial testing or who must meet the requirements of regulatory agencies or those teaching these testing areas.

**Topics:**

- Good Laboratory Practice: history and current requirements
- New AOAC hard surface disinfectant test: comparison with old methods
- Industry self-regulation (CSMA [Chemical Specialty Manufacturers Association])
- EPA collaborative agreement: tuberculocidal test, neutralizers and testing, and virucidal testing

**Objectives:** At the completion of the program, the participants will be knowledgeable about the background and rationale for changes in EPA, AOAC, International, and FDA testing of the effectiveness of disinfectants and the Good Laboratory Practice now required by the regulatory agencies when these tests are performed.

### W9. Use of Gene Probes in the Clinical Microbiology Laboratory

(Eligible for 6.5 Category 1 CME credits)

Friday, 8:00 A.M. (full day), Sheraton New Orleans

**Faculty:** GERRI S. HALL, Cleveland Clin. Fndn., Cleveland, Ohio; MATTHEW BANKOWSKI, Diagnostic Services, Inc., Naples, Fla.; and RAYMOND KAPLAN, SmithKline Beecham Clin. Lab., Tucker, Ga.

**Audience:** This 1-day lecture workshop is directed to individuals who have knowledge of hybridization principles and probe technologies and are interested in keeping abreast of what is available and of means of implementation of probes in their clinical laboratories.

**Topics:**

- Overview of probe technology
- Methods for hybridization and its detection
- Use of probes in the detection of enteric pathogens
- Use of probes in the detection of pulmonary pathogens
- Polymerase chain reaction (PCR)
- Use of PCR in the clinical laboratory

**Objectives:** At the completion of the program, participants will be knowledgeable in the basic principles of DNA probe technology, including what a probe is and how it is made. Participants will learn about the various methods for hybridization and how hybridization is detected. They should gain information about the current status of commercially available probes and what can be anticipated in the future.

### W10. Rapid Methods in Clinical Microbiology

(Eligible for 6 Category 1 CME credits)

Saturday, 8:30 A.M. (full day), Sheraton New Orleans

**Faculty:** SAM AINSWORTH, VA Med. Ctr., Alexandria, Va.; JACK L. PERRY, VA Med. Ctr., Wichita, Kans.; MALCOLM SLIFKIN, Allegheny Gen. Hosp., Pittsburgh, Pa.; and JAMES W. SNYDER, Univ. of Louisville, Louisville, Ky.

**Audience:** This 1-day lecture workshop is directed to bench-level microbiologists who are interested in learning the most relevant cost-effective methodologies for the rapid identification of gram-negative bacilli, gram-positive cocci, and *Moraxella* spp.

**Topics:**

- Automation in the clinical microbiology laboratory
- Isolation, identification, and antimicrobial susceptibility of *Moraxella catarrhalis*
- Rapid detection of streptococci and related gram-positive cocci
- Rapid and inexpensive isolation and identification of commonly occurring gram-negative bacilli

**Objectives:** At the completion of this program, the participants will be knowledgeable about how to isolate and identify, with minimal criteria, *Moraxella catarrhalis* and other pathogens from respiratory tract specimens. They will also know how to rapidly identify streptococci and other gram-positive pathogens and how to rapidly and inexpensively identify common gram-negative bacilli. In addition, they will be knowledgeable about how to select instrumentation for rapid identification and susceptibility testing based on economic and noneconomic factors.

### W11. Current Perspectives in Antimicrobial Susceptibility Testing

(Eligible for 6.5 Category 1 CME credits)

Saturday, 8:30 A.M. (full day), Sheraton New Orleans

**Faculty:** DANIEL SAHM, Univ. of Chicago, Chicago, Ill.; JANET HINDLER, UCLA, Los Angeles, Calif.; and JANA SWENSON, CDC, Atlanta, Ga.

**Audience:** The 1-day lecture workshop is directed to medical technologists, supervisors, laboratory directors, pathologists, and infectious disease specialists.

**Topics:**

- Emerging antimicrobial resistance patterns: new challenges for in vitro susceptibility testing methods
- Susceptibility testing of staphylococci and enterococci
- National Committee for Clinical Laboratory Standards: an overview
- Susceptibility testing of nonfastidious gram-negative bacilli
- Susceptibility testing of gram-negative cocci and fastidious gram-negative bacilli
- Traditional and nontraditional approaches to quality assurance and quality control of antimicrobial susceptibility testing

**Objectives:** At the completion of the program, participants will have up-to-date information concerning susceptibility testing protocols, procedures, interpretations, and result reporting. Participants will be able to use this information to optimize their approach to susceptibility testing.

## 1992 GENERAL MEETING WORKSHOPS

### W12. Blood-Borne Pathogens in the Clinical Microbiology Laboratory

(Eligible for 4.0 Category 1 CME credits)

Saturday, 8:00 A.M. (half day), Sheraton New Orleans

**Faculty:** GERRI HALL, KATHLEEN GLEASON-BEAVIS, and BELINDA YEN-LIEBERMANN, Cleveland Clin. Fndn., Cleveland, Ohio.

**Audience:** This ½-day lecture workshop is directed to medical technologists in the clinical laboratory as well as to directors and supervisors of laboratories. This workshop would be of interest to those who handle blood specimens in the clinical microbiology laboratory.

**Topics:**

- Agents responsible for hepatitis, specifically hepatitis B and hepatitis C viruses
- Retroviral agents, human immunodeficiency virus types 1 and 2, and human T-cell lymphotropic virus type I

**Objectives:** At the completion of the program the participants will be knowledgeable about the many types of pathogens that may be blood borne. They will know about the agents responsible for hepatitis, specifically hepatitis B and hepatitis C viruses; the retroviral agents, human immunodeficiency virus types 1 and 2, and human T-cell lymphotropic virus type I; and the incidence of these agents. Participants will know how to detect the agents diagnostically and how laboratory workers can best be protected from them.

### W13. Instrumentation in Clinical Microbiology

(Eligible for 5 Category 1 CME credits)

Friday, 8:00 A.M. (full day), Sheraton New Orleans

**Faculty:** JUDY A. DALY, Primary Children's Med. Ctr., Salt Lake City, Utah; KATHLEEN DAVIS EISENACH, Arkansas Children's Hosp., Little Rock; MARIE CASTAGNO PEZZLO, Univ. of California-Irvine Med. Ctr., Orange; DAVISE H. LARONE, Lenox Hill Hosp., New York, N.Y.; and RAY JOHNSON, Gen-Probe, San Diego, Calif.

**Audience:** The 1-day lecture workshop is directed to clinical microbiologists and medical technologists responsible for the general management of microbiology diagnostic equipment. The strengths and weaknesses of current instruments as well as instruments under development will be presented. Additionally, speed, ease of use, and labor reduction will be addressed. It is assumed that participants have a basic understanding of clinical microbiology.

**Topics:**

- Automated approaches to performing blood cultures
- Automated methods for detection of bacteriuria
- Automated identification and susceptibility systems
- Automated antigen detection methods in infectious disease diagnosis
- Future instrument systems

**Objectives:** At the completion of the program, participants will be knowledgeable about the instruments available to clinical microbiologists and future systems being developed. Current,

comprehensive comparative data on all systems will be available.

### W14. Anaerobic Bacteriology for the Clinical Laboratory

(Eligible for 6.5 Category 1 CME credits)

Friday, 8:15 A.M. (full day), Sheraton New Orleans

**Faculty:** JIM MANGELS, Stanford Univ. Hosp., Stanford, Calif.; LINDA BYRD, Parkland Mem. Hosp., Dallas, Tex.; DIANE CITRON, Santa Monica Hosp., Santa Monica, Calif.; and MIKE COX, Anaerobe Systems, Santa Clara, Calif.

**Audience:** The 1-day lecture workshop with laboratory sessions is directed to individuals who wish to enhance and update their knowledge of anaerobic bacteria. It is assumed that participants have a basic knowledge of clinical bacteriology.

**Topics:**

- Role of anaerobes in infection
- Selection, collection, and transport of specimens; importance of media
- Initial processing methods: toxicity of oxygen
- Identification: rapid and conventional methods
- Taxonomy update
- Susceptibility testing
- Quality assurance for anaerobic media
- Laboratory identification of unknowns

**Objectives:** At the completion of the program, participants will understand the relevance of anaerobic bacteria in infectious diseases, as well as the methods for isolation, identification, and susceptibility testing of anaerobes.

### W15. Update on Sexually Transmitted Diseases

(Eligible for 8.5 Category 1 CME credits)

Saturday, 8:00 A.M. (full day), Sheraton New Orleans

**Faculty:** VICKI BASELSKI and DAVID SMALLEY, Univ. of Tennessee, Memphis; KAYE COX, Memphis-Shelby County Health Dept., Memphis, Tenn.; and J. CAMERON HALL, Baptist Regional Lab., Memphis, Tenn.

**Audience:** The 1-day lecture workshop is directed to clinical microbiologists, medical technologists, and physicians who are actively involved in the laboratory diagnosis of sexually transmitted diseases.

**Topics:**

- Overview of current issues
- *Neisseria gonorrhoeae* and *Haemophilus ducreyi*
- *Chlamydia trachomatis*
- Vaginitis and vaginosis
- Human papillomavirus and herpes simplex virus
- Genital mycoplasmas
- Syphilis
- Clinical laboratory strategies

**Objectives:** At the completion of the program, participants will be knowledgeable about currently available methods for the diagnosis of important sexually transmitted diseases, including

## 1992 GENERAL MEETING WORKSHOPS

both conventional and newer rapid methods, and will be able to select appropriate procedures for use in a clinical laboratory.

### W16. Quality Improvement in Clinical Microbiology

(Eligible for 3.5 Category 1 CME credits)

Friday, 8:00 A.M. (half day), Sheraton New Orleans

*Faculty:* CALVIN L. STRAND, Jersey City Med. Ctr., Jersey City, N.J.; RAYMOND C. BARTLETT, Hartford Hosp., Hartford, Conn.; and RON SCHIFMAN, Tucson VA Med. Ctr., Tucson, Ariz.

*Audience:* The program is directed to microbiology technologists, supervisors, doctoral scientists, and physicians who desire to enhance and expand existing quality improvement programs.

*Topics:*

- Applying quality improvement
- Improving microbiologic testing practice
- Evolution in quality management

*Objectives:* At the completion of the workshop the participants will be knowledgeable about developing or expanding their current quality improvement (assurance) programs to continuously improve reliability, efficiency, and utilization of clinical microbiology laboratory services.

### W17. Descriptive and Inferential Statistics for Microbiologists

(Eligible for 7.0 Category 1 CME credits)

Friday, 8:00 A.M. (full day), Sheraton New Orleans

*Faculty:* EUGENE W. RYPKA, Lovelace Med. Ctr., Albuquerque, N. Mex., and GEORGE BROWN, Albuquerque, N. Mex.

*Audience:* This 1-day lecture workshop with demonstration is directed to clinical microbiologists with a basic understanding of the fundamentals, using practical worked examples. The level of teaching is beginning to intermediate. The material may be used as a first course or as a review.

*Topics:*

- Classification of variables, populations, and sampling
- Frequency distributions, comparison of means, errors, and correlations
- Hypothesis testing, correlation, sensitivity and specificity
- Identification scheme construction and Bayesian statistics

*Objectives:* At the completion of the program the participants will be knowledgeable about the importance of statistics in the design of experiments and in decisions about the significance of the data. They will be able to objectively select an optimal test set and use probabilistic data to determine likelihood answers using minimal testing.

### W18. Tissue-Directed Antibiotic Therapy

(Eligible for 4.5 Category 1 CME credits)

Friday, 1:00 P.M. (half day), Sheraton New Orleans

*Faculty:* JEROME SCHENTAG, Millard Fillmore Hosp., Buffalo, N.Y., and PRISCILLA B. WYRICK, Univ. of North Carolina Sch. of Med., Chapel Hill; MICHAEL M. BARZA, Tufts Univ. Sch. of Med., Boston, Mass.; JERRY DONALD-WITZ, Univ. of Virginia Hosp., Charlotte; THOMAS STEINBERG, Washington Univ. Sch. of Med., St. Louis, Mo.; and KENNETH ALDRIDGE, Louisiana State Univ. Med. Ctr., New Orleans.

*Audience:* The ½-day lecture workshop is directed to physicians and scientists who are interested in the mechanisms of antibiotic activity, pharmacokinetics, and usage. This workshop is geared toward individuals at the graduate and postgraduate levels.

*Topics:*

- Tissue-directed pharmacokinetics and pharmacodynamics of antibiotics
- Intracellular transport and bioactivity of newer antibiotics
- Intracellular pathogens: antibiotic susceptibility
- Intracellular biology and pharmacotherapy of *Chlamydia trachomatis*

*Objectives:* At the completion of the program, the participants will be knowledgeable about the new advances in cellular drug transport, intracellular bioactivity of antibiotics, and pharmacokinetics and pharmacodynamics of tissue-directed antibiotics, and the impact of these factors on the in vitro and in vivo efficacy of antimicrobial agents.

### W19. Biological and Chemical Safety in the Workplace: OSHA Regulations

(Eligible for 4.0 Category 1 CME Credits)

Saturday, 8:00 A.M. (half day), Sheraton New Orleans

*Faculty:* LYNN M. LITTLE and JOHN L. MURAD, Univ. of Texas Southwestern Med. Ctr., Dallas.

*Audience:* The ½-day lecture workshop is directed to supervisors responsible for personnel, laboratory, and facility safety and individuals who work with hazardous chemicals or blood-borne pathogens.

*Topics:*

- Specific OSHA regulations: an overview
- Hazard communication standard
- Hazardous chemicals standard: chemical hygiene plan
- Blood-borne pathogens standard: infection control plan
- Ergonomics in the workplace

*Objectives:* At the completion of the program, the participants will be knowledgeable about the major OSHA safety regulations in the workplace. They will also learn steps in complying with the regulations.



## 1992 GENERAL MEETING WORKSHOPS

### **W20. Parasitic Infections in the Immunocompromised Host**

*(Eligible for 7.5 Category 1 CME credits)*

**Friday, 8:00 A.M. (full day), Sheraton New Orleans**

*Faculty:* MARILYN BARTLETT and JAMES SMITH, Univ. Hosp., Indianapolis, Ind.; RALPH BRYAN, CDC, Atlanta, Ga.; and WILLIAM CURRENT, Lilly Corporate Ctr., Indianapolis, Ind.

*Audience:* The 1-day lecture workshop with hands-on laboratory demonstrations is directed to individuals responsible for diagnosing parasitic infections in the immunocompromised host. Emphasis will be on specimen handling and examination for detection, identification of infectious stages, and microscop-

ic examination. Demonstrations will include commercially available kits.

*Topics:*

- *Pneumocystis carinii*
- *Cryptosporidium parvum*
- Laboratory: *P. carinii*, cryptosporidium staining, examination, demonstrations
- *Toxoplasma gondii*, *Isospora belli*, and *Strongyloides stercoralis*
- *Microsporidium* spp.
- Laboratory: staining toxoplasma, examination of sections, demonstrations

*Objectives:* At the completion of the program, participants will be able to process specimens appropriately to detect and identify selected organisms. They will be able to identify organisms in materials stained in class as well as provided in reference slides. They will be able to return with, and implement at their own institutions, protocols provided in the workshop handouts.

**Personal Data Form**  
**AMERICAN SOCIETY FOR MICROBIOLOGY PLACEMENT SERVICE**  
 1325 Massachusetts Ave., N.W., Washington, D.C. 20005-4171  
**PERSONAL DATA FORM MUST BE TYPED**

Reg. # \_\_\_\_\_

(Leave Blank)

NAME \_\_\_\_\_  
                     Last                    First                    Middle

MAILING ADDRESS \_\_\_\_\_  
                     Number and Street

\_\_\_\_\_ City State Zip Code

Telephone No. \_\_\_\_\_  
                     Home Business

J.S. Citizen Yes  No       ASM Member Number \_\_\_\_\_      Date Available for Employment \_\_\_\_\_      Salary Desired \_\_\_\_\_

TYPE OF WORK DESIRED:

SUMMARY	
Field(s): _____ (See reverse side of this form - list no more than 5 applicable fields)	
Highest Degree _____	
Positions in which interested:	
<input type="checkbox"/> Academic	<input type="checkbox"/> Industrial
<input type="checkbox"/> Government	<input type="checkbox"/> Infectious Diseases
<input type="checkbox"/> Hospital-Clinical	<input type="checkbox"/> Private Practice
Would you accept a Postdoctoral position?	
<input type="checkbox"/> Yes	<input type="checkbox"/> No
<input type="checkbox"/> Minority	
Location(s) you would accept: (see reverse) _____	

COLLEGES & UNIVERSITIES ATTENDED	LOCATION	DEGREE & DATE RECEIVED	MAJOR

Certified, Registered or Licensed: Yes  No  By: \_\_\_\_\_

Publications (latest two)(jour., vol., pp.) \_\_\_\_\_

Number of publications excluding abstracts \_\_\_\_\_ Number of abstracts \_\_\_\_\_

EMPLOYMENT RECORD or Residencies (List present or latest place of employment first.)

Employer	Address	Dates of Employment	Position Held

SPECIALIZED TRAINING/EXPERIENCE/ACHIEVEMENTS:

PROFESSIONAL REFERENCES (Give names and addresses.)

## PROCEDURES TO REGISTER

- Include all information requested on the Personal Data Form.
- Complete the "Summary Box" by referring to the keys below.
- Complete the "Type of Work Desired" and "Specialized Training/Experience/Achievements" sections.
- The Personal Data Form **MUST BE TYPED**. No additional information can be attached or included. Remember: This form represents the first impression you will make on a prospective employer.
- Registration for one year is \$40 for ASM members and \$100 for nonmembers. An additional \$10 processing fee will be assessed to ASM members who register on-site at an ASM meeting. The fee must accompany the Personal Data Form.
- Please promptly notify the Placement Service of a change of address or availability status. Any other changes or additions to the form require reregistration.

## FIELDS OF MICROBIOLOGICAL SPECIALIZATION

List no more than five (5) applicable fields in **ORDER OF PREFERENCE**

- |   |  |
|---|--|
| A = Clinical  | F = Medical (including infectious disease, parasitology, and chemotherapy) |
| B = General (including phycology)   | G = Mycology (general and medical)   |
| C = Genetics and Molecular Biology  | H = Physiology and Biochemistry  |
| D = Immunology  | I = Virology   |
| E = Industrial and Applied (including food, dairy, and antibiotic production, etc.) | J = Environmental  |

## GEOGRAPHIC REGIONS

List regions of interest in **ORDER OF PREFERENCE**

- 1 = **New England** - Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont
- 2 = **Middle Atlantic** - New Jersey, New York, and Pennsylvania
- 3 = **East North Central** - Illinois, Indiana, Michigan, Ohio, and Wisconsin
- 4 = **West North Central** - Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, and South Dakota
- 5 = **South Atlantic** - Delaware, District of Columbia, Florida, Georgia, Maryland, North Carolina, South Carolina, Virginia, and West Virginia
- 6 = **East South Central** - Alabama, Kentucky, Mississippi, and Tennessee
- 7 = **West South Central** - Arkansas, Louisiana, Oklahoma, and Texas
- 8 = **Mountain** - Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Utah, and Wyoming
- 9 = **Pacific** - Alaska, California, Hawaii, Oregon, and Washington
- 10 = **No Preference**

## 1992 GENERAL MEETING SESSION TITLES

The following is a listing of session titles by division. Within some of the divisional listings are sessions that originate in another division but may be of common interest. These sessions are designated by an asterisk, and the division in which they originate is shown in parentheses. A dagger indicates a session with a divisional lecture.

Group and Division	Session Type	Session Number
<b>GROUP I</b>		
Cystic Fibrosis: a Genetic Disease and Its Immunological and Microbiological Consequences	Symposium	127
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Mechanism of Action and Resistance	Poster	31
Antibiotic Resistance	Poster	32
Susceptibility of Fungi and Other Microorganisms	Poster	76
Miscellaneous: Antimicrobial Activity	Poster	77
Susceptibility to Quinolones	Poster	124
Nonquinolone Inhibitors of DNA Gyrase	Seminar	182
† Resistance to Quinolones	Slide	217
Susceptibility and Resistance to $\beta$ -Lactams	Poster	237
Clinical Trials and Efficacy in Animals	Poster	279
Beta-Lactam Resistance	Slide	295
<u>Division B</u>		
Genetic Regulation of the Synthesis of Fimbriae	Slide	12
Exotoxins: <i>Bordetella</i> , <i>Corynebacterium</i> , <i>Pseudomonas</i>	Poster	41
Hemolysin, Urease, Phosphatase, Protease, Lipase	Poster	42
Molecular Biology of Bacterial Respiratory Diseases	Seminar	52
Genetics of Virulence of Pathogenic Bacteria	Poster	70
Pathogenic <i>Neisseria</i>	Slide	97
Iron: Transferrin and Hemoglobin Binding, Siderophores, and Outer Membrane Proteins	Poster	111
Exotoxins	Poster	112
Virulence and Invasion of <i>Salmonella</i> and <i>Escherichia coli</i>	Poster	113
Against the Odds: <i>Salmonella</i> Survival Strategies	Seminar	143
Lyme Borreliosis	Slide	144
Protozoan Pathogens	Poster	152
† Bacterial Invasion of Host Cells	Slide	181
Molecular Biology of Uropathogens	Seminar	187
Attaching and Effacing Agents of Diarrhea	Seminar	221
Streptococci and Staphylococci: Virulence Factors and Animal Models of Infection	Poster	245
Streptococci and Staphylococci: Surface Proteins and Extracellular Components	Poster	246
Polysaccharides and Lipopolysaccharides of Bacterial Pathogens	Slide	257
Enterotoxins	Poster	281
Immune Response to Pathogenic Microorganisms: Animal Models of Infection	Poster	286
Host Factors in Infection: Specific and Nonspecific Defenses	Poster	287

Group and Division	Session Type	Session Number
Pathogenesis of Food-Borne Disease	Seminar	297
<i>Haemophilus</i> and <i>Branhamella</i> spp.: Surface Components and Dynamics of Colonization	Poster	303
Adherence of Pathogens to Host Cells: Fimbriae and Other Adhesins	Poster	304
<u>Division D</u>		
Bactericidal Activities of Phagocytes	Slide	11
Molecular Biology of Treponemes and Other Spirochetes	Slide	51
Model Systems in Sexually Transmitted Disease Research: from Tissue Culture to Experimental Human Infection	Seminar	53
Physiology and Structure of Pathogenic Bacteria	Poster	69
<i>Pseudomonas</i> Virulence Factors and Physiology	Poster	114
Chlamydia: Epidemiology, Physiology, and Immunology	Poster	122
Intracellular Pathogens: <i>Rickettsia</i> , <i>Coxiella</i> , and <i>Ehrlichia</i>	Poster	123
† Pelvic Inflammatory Diseases: Immunity and Pathogenesis	Seminar	141
Oral Colonization and Pathogenic Activities of Streptococci and Other Microorganisms	Slide	177
Polymerase Chain Reaction and Other DNA Assays for Detection of Pathogens	Poster	201
Lipopolysaccharides and Lipooligosaccharides of Gram Negative Pathogens	Poster	207
Widening Spectrum of Virulence: Emerging and Established Pathogenic Microorganisms	Poster	208
* Attaching and Effacing Agents of Diarrhea (B)	Seminar	221
Regulation and Function of Bacterial Cytolytic Toxins	Seminar	225
Streptococci, Enterococci, and Staphylococci	Poster	247
Enteric Pathogens	Poster	280
Capsule Expression by Bacterial Pathogens	Slide	299
Bacterial Adherence, Invasion, and Surface Protein Expression	Poster	305
Bacterial Colonization and Biofilm Formation on Biomaterials	Poster	313
Pili and Fimbriae: Structure, Genetics, and Expression	Poster	314
<u>Division E</u>		
Immune Response to Microbes: Lymphocyte Subsets, Stress Proteins, and Superantigens	Slide	17
Vaccines and Immune Responses	Poster	40
Endotoxin Effects on Signal Transduction	Seminar	55
Mechanisms of Protective Immunity: Cytokines and Isotype-Specific Antibody Responses	Slide	58
Cytokine and Inflammatory Host Responses to Infections	Poster	121
Superantigens and the Immune System	Seminar	135
Improved Methods of Protective Immunity: Genetically Attenuated Organisms and Conjugate Vaccines	Poster	160
Cytokines and Infectious Diseases	Seminar	178
New Developments in Vaccines: Vehicles for Effective Antigen Delivery	Slide	185
† Antimicrobial Mechanisms and Effector Molecules	Seminar	218

Group and Division	Session Type	Session Number
New Developments in Bacterial and Parasite Vaccines	Seminar	264
<u>Division G</u>		
Molecular Biology of Mycoplasmas	Seminar	20
Mollicutes and Disease: Etiology, Diagnosis, and Antimicrobial Susceptibility	Poster	68
Mycoplasmas in Veterinary Medicine	Seminar	99
Immunoprophylaxis of Mycoplasmal Diseases	Seminar	147
Mollicutes: Molecular and Cell Biology	Poster	199
† Mollicutes: Cell Surfaces, Immunology, and Host Interaction	Slide	227
Plant and Insect Mollicutes	Seminar	269
Bovine Spongiform Encephalopathy: Mad Cow Disease	Seminar	298
<u>Division U</u>		
What Mycobacteriologists Can Learn from Studies on Other Pathogens	Seminar	14
New Methods for the Diagnosis of Mycobacterial Infections	Slide	16
Molecular Biology in the Diagnosis and Epidemiology of Tuberculosis: from Bench to Bedside	Seminar	49
Immunopathogenesis of <i>Mycobacterium avium</i> Complex Disease	Seminar	98
Mycobacterial Genes and Gene Products and Their Roles in Pathogenesis	Slide	102
Mycobacterial Infections and AIDS	Slide	145
Mycobacteria: Cultivation, Identification, and Pathogenic Mechanisms	Poster	151
Leprosy Research: Present and Future	Seminar	186
Diagnosis of Mycobacterial Infections	Poster	200
† Cell-Mediated Immune Responses in Mycobacterial Infections	Slide	222
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Mycobacterial Drug Resistance and Susceptibility	Poster	278
<b>GROUP II</b>		
Microbial Developments	Symposium	48
<u>Division H</u>		
† Conjugative Transposons and Integrons	Slide	5
<i>Escherichia coli</i> and <i>Salmonella typhimurium</i> Cell Biology	Seminar	6
Novel Regulatory Proteins	Poster	27
Mutagenesis and Recombination	Poster	28
Sigma Factors and Promoters	Poster	35
Plasmids: Replication and Conjugation	Poster	36
Molecular Taxonomy and Evolution	Poster	37
DNA Replication and Modification	Poster	72
Plasmids: Novel Properties	Poster	79
DNA Recombination: Biology and Biochemistry	Seminar	87
Global Regulation: Carbon, Nitrogen, and Iron	Poster	108

Group and Division	Session Type	Session Number
Protein Export in <i>Escherichia coli</i> : the Genetic Approach	Seminar	128
Gene Regulation in Anaerobiosis and in Photosynthesis	Poster	156
Translation	Poster	157
Genome Structure and Analysis	Poster	164
Environmental Sensing: Pressure and Heat	Poster	166
Transcription Activation: Activator-RNA Polymerase	Seminar	172
Contacts		
Metabolic Operon Organization	Poster	204
Miscellaneous Shock Responses	Poster	205
Novel Regulatory Mechanisms in <i>Bacillus subtilis</i>	Seminar	213
Novel Vectors and Overexpression Systems	Poster	241
Surviving Hard Times: Growing Interest in Nongrowing Cells	Seminar	260
DNA Rearrangements: Transposition and Inversion	Poster	273
mRNA: Structure, Turnover, and Antisense	Poster	283
* Microbial Metal-Binding Peptides: Gene Regulation and Function (Q)	Seminar	289
Extracellular Destiny of Gram-Negative Polypeptides	Seminar	291
Eukaryotic Genes: Expression and Functions	Poster	306
Gene Expression: Protein-DNA Interactions	Poster	312
<u>Division I</u>		
Microbial Growth	Slide	15
Central Physiology Processes Performed by Phototrophic Bacteria	Seminar	56
Archaeobacteria I: Physiology and Molecular Biology	Poster	73
Archaeobacteria II: Diversity and Structure	Poster	80
Chemotaxis and Motility	Slide	95
Microbial Metabolism and Products	Poster	118
† Microbes in the Environment	Slide	130
* Iron and Sulfur Chemolithotrophy (K)	Seminar	174
Microbial Symbiosis and Development	Poster	196
Sensory/Response Systems for Diverse Environmental Signals	Seminar	223
Cairnsian Mutations: a Specific Response to Stress?	Seminar	292
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<u>Division J</u>		
Structure and Function of Bacterial "Compartments"	Seminar	24
Physiological Studies of Living Bacterial Biofilms	Seminar	129
Morphology and Cell Surfaces I	Poster	250
Morphology and Cell Surfaces II	Slide	258
<u>Division K</u>		
Biochemistry of Methanogenesis from Methyl-Containing Substrates	Seminar	7
Eukaryotic Microbial Metabolism	Poster	81
† Diazotrophic Symbionts: Genetics and Metabolism	Seminar	90
Bacterial Transport: ATPase, PTS, Permeases	Slide	105
Metabolism of Phenolics and Halogenated Organics	Poster	117
* Physiological Studies of Living Bacterial Biofilms (J)	Seminar	129
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<b>Group and Division</b>	<b>Session Type</b>	<b>Session Number</b>
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Outer and Inner Membranes: Structure and Function	Poster	197
Fatty Acid and Phospholipid Metabolism	Slide	214
Microbial Adaptation to Environmental Stress	Seminar	215
Genetic and Enzymatic Regulation of Metabolic Pathways	Poster	251
Molecular Biology and Biochemistry of Bacterial Carbohydrate Transporters	Seminar	261
Polymer Degradation and Hydrolytic Enzymes	Poster	274
* Microbial Metal-Binding Peptides: Gene Regulation and Function (Q)	Seminar	289
Regulation of Biosynthetic Pathways	Slide	293
<u>Division M</u>		
Analysis of Prokaryotic Genomes	Seminar	89
RNA Polymerase: Promoter Interactions	Seminar	149
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† RNA Bacteriophages Revisited: Correlation of Genome Structure and Function	Seminar	233
Interactions of Host and Phage Elements in Gene Expression	Slide	271
Control Mechanisms of Phage Replication and Expression	Poster	307
<u>Division R</u>		
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Experimental Studies in Population Genetics and Evolution	Seminar	88
† Systematics and Molecular Diversity of Prokaryotes	Slide	173
Microbial Systematics and Diversity	Poster	240
Reproducible Biological Materials: Why You Need Them and Where To Get Them	Seminar	259
* Update '92 III (BET)	Seminar	288
<b>GROUP III</b>		
Applications of Modeling in Microbiology	Symposium	136
<u>Division N</u>		
Microbiologically Influenced Corrosion	Seminar	23
Microbial Ecology: Soil and Water	Poster	34
Aspects of Drinking Water Microbial Ecology	Seminar	59
† Microbial Ecology: Groundwater and Subsurface	Slide	100
Microbiological Water Quality	Poster	107
Plant-Microbe Interactions	Poster	161
Marine Microbial Ecology	Poster	203
Molecular Approaches in Subsurface Microbial Ecology	Seminar	231
Biology of N <sub>2</sub> Fixation	Poster	239
Biodegradation and Bioremediation	Slide	255

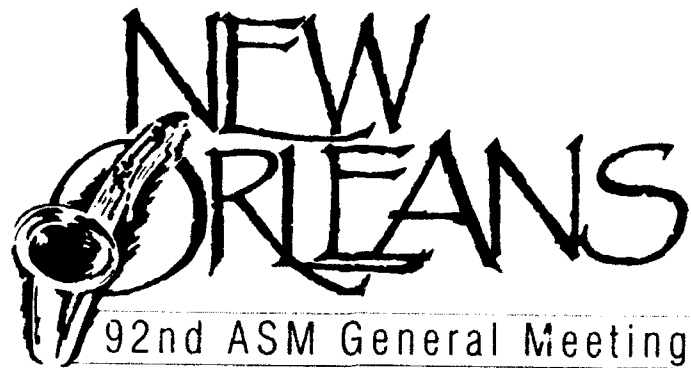


Group and Division	Session Type	Session Number
<u>Division O</u>		
Advances in Molecular Genetics of Secondary Metabolism	Seminar	22
Industrial-Scale Microbial and Enzymatic Production of Specialty Chemicals	Seminar	64
Natural Product Discovery: New Leads and Methods	Slide	104
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† Novel Molecular Genetic Approaches for the Production of New Metabolites in Streptomycetes	Seminar	142
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Antibody Engineering in Microbes	Seminar	183
Biotransformations and Bioconversions	Slide	188
Solventogenic Microbes: Natural and Engineered	Slide	232
Scaleup: Interface between Microbiologists and Biochemical Engineers	Seminar	268
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<u>Division P</u>		
Recent Advances in the Recovery of Food-Borne Pathogens	Seminar	21
How Much <i>Listeria monocytogenes</i> Is Too Much?	Round Table	65
What Is the Significance of <i>Salmonella</i> , <i>Listeria</i> , and <i>Campylobacter</i> in Foods?	Seminar	94
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† Advances in Detection of Pathogenic Bacteria in Foods	Slide	146
Detection of Pathogens by Conductance Microbiology	Seminar	192
Characterization and Detection of Gram-Positive Bacteria in Foods	Poster	202
Nucleic Acid Amplification and Other Innovative Detection Systems	Seminar	230
Control and Detection of Yeast, Fungi, and Bacteria in Foods	Poster	249
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<u>Division Q</u>		
Assessing the Use of Nonindigenous Microorganisms in Bioremediation I	Seminar	19
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Microbial Interactions with Sulfur Compounds	Poster	33
Assessing the Use of Nonindigenous Microorganisms in Bioremediation II	Seminar	60
† Molecular Probes in Microbial Ecology	Slide	63
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Biodegradation of Chlorinated Alkanes and Alkenes	Poster	248
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† Viral Gene Expression	Slide	18
* Discovery and Applications of RNA Packaging Signals (T)	Seminar	96
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† RNA Viruses II	Slide	57
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* Molecular Mechanisms of Viral-Induced Disease (S)	Seminar	224
Detection of Human Retroviruses	Poster	242

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<b>GROUP V</b>		
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† Practical Problems in Clinical Microbiology	Round Table	85
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Fungi: Detection, Identification, and Antimicrobial Susceptibility Testing	Poster	119
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Alternative Approaches for Determining MICs	Seminar	126
* Quantitative Cultures in Hospital-Acquired Infections (L)	Seminar	134
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* Rapid Diagnosis: New Pathogens and Old (V)	Seminar	212
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<i>Clostridium difficile</i> Toxin Detection	Poster	276
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Anaerobes: Isolation, Toxin Detection, Identification, and Antibiotic Susceptibility Testing	Poster	285
* Bovine Spongiform Encephalopathy: Mad Cow Disease (G)	Seminar	298
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<b>Group and Division</b>	<b>Session Type</b>	<b>Session Number</b>
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Fastidious and Unusual Pathogens: Culture, Detection, and Characterization	Poster	310
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Defense against Fungal Infections	Slide	92
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† Pathogenesis of Fungal Infections	Slide	131
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Molecular Characterization of Virulence Factors in Pathogenic Fungi	Seminar	180
Cytokines in the Mycoses	Seminar	219
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† Problematic Nosocomial Infections: Epidemiology and Control	Slide	61
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Protecting Workers/Protecting Patients: an Infection Control Dilemma for the 1990s	Seminar	169
Emergence of Resistant Pathogens; Catheter-Related Infections	Poster	235
<u>Division V</u>		
Strategy of Isolation and Detection of Human Immunodeficiency Virus To Achieve Accurate Diagnosis	Seminar	46
Serodetection of Bacterial, Parasitic, and Miscellaneous Antigens	Poster	67
Hepatitis Viruses from A to F	Seminar	86
† New Therapeutic Advances in Infectious Diseases and Malignancy	Seminar	133
* Cytokines and Infectious Diseases (E)	Seminar	178
Case Presentations in Clinical and Diagnostic Immunology	Round Table	179
Rapid Diagnosis: New Pathogens and Old	Seminar	212
AIDS: Infections and Diagnostic Microbiology	Seminar	253
Hepatitis Virus, Human Immunodeficiency Virus, and Other Viral and Mycoplasma Infections	Poster	302



*You are cordially invited to attend the  
ASM Opening Reception*

*supported by a grant from Roerig*

*Tuesday, May 26, 1992  
Immediately following the Opening Session  
Aquarium of the Americas*

*Join the traditional New Orleans style Second Line Parade as  
we march to the Aquarium with band accompaniments!*

*...or shuttle bus transportation departs from the Convention Center  
immediately following the Opening Session. Return transportation  
provided to all ASM hotels at the end of the function.*

## Session 1

### OFFICIAL OPENING SESSION 92ND GENERAL MEETING

*(Eligible for continuing education credit)*

Tuesday, 6:00 P.M., Ballroom I, New Orleans Convention Center

Welcome from the General Meeting Program Committee  
JOSEPHINE A. MORELLO, Chairman, GMPC

Greetings from ASM and Announcement of Award Recipients  
RICHARD L. CROWELL, President, ASM

Introduction of the American Society for Microbiology Lecturer  
RICHARD L. CROWELL

The American Society for Microbiology Lecture  
(Supported by the Office of Naval Research)

Of Ribosomes and Volcanoes: Molecular Microbial Ecology and  
Submarine Hydrothermal Vents  
NORMAN R. PACE, Indiana Univ., Bloomington

#### Opening Reception

*(Supported by a grant from Roerig)*

The annual Opening Reception will be held immediately after this session at the Aquarium of the Americas.

## Session 2 (C). Seminar

*(Eligible for continuing education credit)*

### CRITICAL ASSESSMENT OF THE CURRENT STATUS AND FUTURE PROJECTIONS OF MOLECULAR DIAGNOSTIC METHODS

Wednesday, 8:30 A.M., Ballroom IA

Convenors: PATRICK MURRAY, Washington Univ. Sch. of Med., St. Louis, Mo., and JAMES JORGENSEN, Univ. of Texas Health Sci. Ctr., San Antonio

Comparison of Probes and Other Contemporary Methods for the Identification of Mycobacteria  
GLENN ROBERTS, Mayo Clin., Rochester, Minn.

Value of Probes for the Diagnosis of Sexually Transmitted Diseases  
KIMBERLE CHAPIN-ROBERTSON, Yale Univ., New Haven, Conn.

Use of Probes and Amplification Techniques for the Diagnosis of Human Immunodeficiency Virus Infections  
MAX ARENS, Washington Univ., St. Louis, Mo.

Molecular Techniques for Hospital Epidemiology  
MICHAEL MILLER, CDC, Atlanta, Ga.

Future Directions of Molecular Clinical Microbiology  
DAVID H. PERSING, Mayo Clin., Rochester, Minn.

## Session 3. Divisional Group V Symposium

*(Eligible for continuing education credit)*

### ADVANCES IN LABORATORY DIAGNOSIS OF SYSTEMIC FUNGAL INFECTIONS

Wednesday, 8:30 A.M., Room 20

Convenors: J. N. GALGIANI, VA Med. Ctr., Tucson, Ariz., and G. D. ROBERTS, Mayo Clin., Rochester, Minn.

Approaches to Improving the Serologic Diagnosis of Blastomycosis  
J. M. JONES, W.S. Middleton VA Med. Ctr., Madison, Wis.

Recent Information on the Serologic Reagents for Coccidioidomycosis  
J. N. GALGIANI, VA Med. Ctr., Tucson, Ariz.

Status of Urine Antigen Detection in Histoplasmosis  
L. J. WHEAT, Wishard Mem. Hosp., Indianapolis, Ind.

Disseminated Candidiasis: Noncultural Methods of Diagnosis  
W. G. MERZ, Johns Hopkins Univ., Baltimore, Md.

Rapid Methods of Species Identification  
M. A. PFALLER, Oregon Health Sci. Univ., Portland

Future Directions for the Clinical Mycology Laboratory  
G. D. ROBERTS, Mayo Clin., Rochester, Minn.

## Session 4 (AAM). Seminar

*(Eligible for continuing education credit)*

### CHOLERA

Wednesday, 8:30 A.M., Room 90

Convenor: M. M. LEVINE, Univ. of Maryland, Baltimore

The Epidemiology of Cholera: from Snow to Ceviche  
R. GLASS, CDC, Atlanta, Ga.

Cholera in Peru, 1991: Extent of the Epidemic, Modes of Transmission, and Impact of the Outbreak on the Country as a Whole  
E. SALAZAR LINDO, Ministry of Health, Lima, Peru

Noncultivable *Vibrio cholerae* O1 in Environmental Waters, Zooplankton, and Edible Crustacea: Implications for Understanding the Epidemiologic Behavior of Cholera  
R. COLWELL, Univ. of Maryland, College Park

The Molecular Pathogenesis of Cholera: Yet Further Insights  
J. MEKALANOS, Harvard Med. Sch., Boston, Mass.

A Primer on the Therapy of Cholera under Epidemic Conditions  
M. BENNISH, Tufts Univ. Sch. of Med., Boston, Mass.

Old and New Cholera Vaccines: a 100-Year Perspective  
M. M. LEVINE, Univ. of Maryland, Baltimore

WEDNESDAY

## Session 5 (H)

### CONJUGATIVE TRANSPOSONS AND INTEGRONS

Wednesday, 8:30 A.M., Room 37

Moderators: ANNE O. SUMMERS, Univ. of Georgia, Athens, and DON CLEWELL, Univ. of Michigan, Ann Arbor

8:30 Divisional Lecture  
(Eligible for continuing education credit)

Conjugative Transposons  
JUNE R. SCOTT, Emory Univ., Atlanta, Ga.

9:30

- H1. Analysis of Tn916 Excision Events in *Enterococcus faecalis*. J. F. KILBRIDGE\* and K. MIXTER MAYNE. Vassar Col., Poughkeepsie, N.Y.
- H2. The Excisase (Xis-Tn) and Integrase (Int-Tn) of the Conjugative Transposon Tn916. Y. A. SU\* and D. B. CLEWELL. Univ. of Michigan, Ann Arbor.
- H3. Identification of Factors Involved in the Frequency of Tn916 Conjugative Transposition. D. JAWORSKI. Univ. of Michigan, Ann Arbor.
- H4. Stimulation of Excision of Transposon Tn916 from *Streptococcus pneumoniae* Serotype 3. D. A. WATSON,\* D. M. MUSER, and R. J. HAMILL. VA Med. Ctr. and Baylor Col. of Med., Houston, Tex.

10:30

- H5. Identification of a Circular Intermediate of a Conjugative Transposon in *Enterococcus faecalis*. L. B. RICE\* and S. MARSHALL. Dept. of Veteran's Affairs Med. Ctr. and Case Western Reserve Univ. Med. Sch., Cleveland, Ohio.
- H6. Transmissible Cefoxitin Resistance in *Bacteroides* spp. Mediated by a Novel Class A  $\beta$ -Lactamase Encoded on a Mobilizable Transposon. C. J. SMITH\* and A. PARKER. East Carolina Univ., Greenville, N.C.
- H7. Characterization of Transposon Tn4132 Encoding the Type Ib Trimethoprim-Resistant Dihydrofolate Reductase. H. K. YOUNG,\* M. J. QUMSIEH, J. ALLAN, and A. MATHERS. Univ. of Dundee, Dundee, Scotland.
- H8. Polymerase Chain Reaction Mapping of Antibiotic Resistance Genes Inserted as Cassettes into Integrations. C. LA-ROSE,\* C. LEVESQUE, and P. H. ROY. Univ. Laval and Ctr. de Recherche du Ctr. Hosp. Univ. Laval, Ste-Foy, Quebec, Canada.

**Session 6 (H). Seminar**  
(Eligible for continuing education credit)

### ESCHERICHIA COLI AND SALMONELLA TYPHIMURIUM CELL BIOLOGY

Wednesday, 8:30 A.M., Room 39

Convenors: MOLLY B. SCHMID, Princeton Univ., Princeton, N.J., and SARAH FRENCH, Univ. of Virginia, Charlottesville

Transcription Meets Replication: Who's Got the Right of Way?  
SARAH FRENCH, Univ. of Virginia, Charlottesville

Target Recognition and Equilibration of DNA Binding Proteins in Nucleoids  
DAVID PETTIJOHN, Univ. of Colorado Health Sci. Ctr., Denver

Chromosome Segregation in *Escherichia coli*  
MOSELIO SCHAECHTER, Tufts Univ., Boston, Mass.

Biological Roles of Topoisomerase IV  
MOLLY B. SCHMID, Princeton Univ., Princeton, N.J.

Folding and Assembly of *Escherichia coli* Cell Envelope Proteins  
JON BECKWITH, Harvard Med. Sch., Boston, Mass.

*Escherichia coli* Cell Division  
LARRY ROTHFIELD, Univ. of Connecticut Health Ctr., Farmington

**Session 7 (K). Seminar**  
(Eligible for continuing education credit)

### BIOCHEMISTRY OF METHANOGENESIS FROM METHYL-CONTAINING SUBSTRATES

Wednesday, 8:30 A.M., Room 41

Convenors: LACY DANIELS, Univ. of Iowa, Iowa City, and JOE KRZYCKI, Ohio State Univ., Columbus

Overview of Methanogenesis  
RALPH WOLFE, Univ. of Illinois, Urbana

Methanogenesis from Methanol  
GERHARD GOTTSCHALK, Univ. of Gottingen, Gottingen, Germany

Methanogenesis from Acetate  
GREG FERRY, Virginia Polytechnic Inst. and State Univ., Blacksburg

Methyl Reductases in Methanogens  
R. K. THAUER, Philipps Univ., Marburg, Germany

Methyl Transfer Proteins in Acetate Use by Methanogens  
JOE KRZYCKI, Ohio State Univ., Columbus

Methyl Transferases in Methanol Use by Methanogens  
JAN KELTJENS, Univ. of Nijmegen, Nijmegen, The Netherlands

**Session 8 (C). Seminar**  
(Eligible for continuing education credit)

### DIAGNOSTIC ASPECTS OF CORYNEFORM BACTERIA

Wednesday, 8:30 A.M., Room 26

Convenors: MARIE B. COYLE, Univ. of Washington, Seattle, and ALEXANDER VON GRAEVENITZ, Univ. of Zurich, Zurich, Switzerland

Taxonomic Problems, the Key to Coryneform Identification Problems

MARIE B. COYLE, Univ. of Washington, Seattle

Approaches to Identification of Slightly Branching Gram-Positive Rods Including *Arcanobacterium* and Microaerophilic Actinomycetes

JILL E. CLARRIDGE, VA Med. Ctr., Houston, Tex.

Conventional Approach to the Identification of Coryneforms

DANNIE G. HOLLIS, CDC, Atlanta, Ga.

Cellular Fatty Acid Composition as an Aid To Identify Coryneforms

KATHRYN BERNARD, Lab. Ctr. for Disease Control, Ottawa, Ontario, Canada

Attempts To Identify Aerobically Growing Gram-Positive Rods in a Routine Laboratory Using Multiple Techniques

ALEXANDER VON GRAEVENITZ, Univ. of Zurich, Zurich, Switzerland

### Session 9 (BET). Seminar

(Eligible for continuing education credit)

## WHAT SHOULD THE MICROBIOLOGY LABORATORY ACCOMPLISH?

Wednesday, 8:30 A.M., Room 103

Convenors: PHILIP E. STUKUS, Denison Univ., Granville, Ohio, and PAUL G. ENGELKIRK, Univ. of Texas Health Sci. Ctr., Houston

A Diagnostic Microbiology Laboratory Course in a Medical Technology Program

PAUL ENGELKIRK, Univ. of Texas Health Sci. Ctr., Houston

A General Microbiology Laboratory for Large Enrollment Classes

TED JOHNSON, St. Olaf Col., Northfield, Minn.

Research as Teaching at Undergraduate Colleges and Universities

DANIEL BRANNAN, Abilene Christian Univ., Abilene, Tex.

Use of Field Trips and Multimedia Materials in Undergraduate Microbiology Laboratories

JACQUELYN BLACK, Marymount Univ., Arlington, Va.

Integration of Investigative Laboratories and Semester-Length Project into a Liberal Arts College Microbiology Laboratory Course

PHILIP STUKUS, Denison Univ., Granville, Ohio

### Session 10 (L). Seminar (Eligible for continuing education credit)

## ENTEROCOCCI: INCREASING ANTIBIOTIC RESISTANCE AND PREVALENCE AS NOSOCOMIAL PATHOGENS

Wednesday, 8:30 A.M., Room 13

Convenors: JOHN M. BOYCE, Brown Univ. and Miriam Hosp., Providence, R.I., and MARCUS J. ZERVOS, Wayne State Sch. of Med. and William Beaumont Hosp., Royal Oak, Mich.

Epidemiology of Enterococci as Nosocomial Pathogens  
ROBERT P. GAYNES, CDC, Atlanta, Ga.

Identification and Susceptibility Testing of Enterococci  
DANIEL F. SAHM, Univ. of Chicago, Chicago, Ill.

Epidemiologic Typing Systems for Enterococci  
MARCUS J. ZERVOS, William Beaumont Hosp. and Wayne State Univ., Royal Oak, Mich.

Aminoglycoside and  $\beta$ -Lactamase-Mediated Resistance in Enterococci  
BARBARA E. MURRAY, Univ. of Texas Med. Sch., Houston

Mechanisms of Glycopeptide Resistance among Enterococci  
DAVID M. SHLAES, VA Med. Ctr. and Case Western Reserve Univ., Cleveland, Ohio

Nosocomial *E. faecium* and *E. raffinosus* Infections  
JOHN M. BOYCE, Miriam Hosp. and Brown Univ., Providence, R.I.

### Session 11 (D)

## BACTERICIDAL ACTIVITIES OF PHAGOCYTES

Wednesday, 8:30 A.M., Room 2

Moderators: DAVID P. SPEERT, Univ. of British Columbia, Vancouver, British Columbia, Canada, and M. T. LABRO, INSERM U.294, Paris, France

8:30

D1. Direct Binding of Group B Streptococci to Murine Peritoneal Macrophages. T. G. PISTOLE\* and A. R. SLOAN. Univ. of New Hampshire, Durham.

D2. Complement Receptor Four (CR4, p150,95) Participates in the Bactericidal Activity of Adult and Neonatal Neutrophils toward Type III Group B Streptococci. J. V. CUNNINGHAM\* and K. J. GOODRUM. Ohio Univ., Athens.

D3. Effects of Cytokines on Intracellular Killing of *Brucella abortus* and the Mechanisms Involved. X. JIANG\* and C. L. BALDWIN. Ohio State Univ., Columbus.

D4. Zidovudine Effect on Lysozyme Activity and Release in Human Granulocytes. B. STYRT\* and N. MUMMAW. Michigan State Univ., East Lansing.

WEDNESDAY



9:30

- D5.** The Mechanism by Which Glucose Induces Murine Macrophages To Phagocytose *Pseudomonas aeruginosa*. S. BARGHOUTH\* and D. P. SPEERT. Univ. of British Columbia, Vancouver, British Columbia, Canada.
- D6.** Impaired Oxidative and Cidal Responses of Chlamydia-Exposed Polymorphonuclear Leukocytes. L. MOORE,\* J. HUMBERT, and H. BRADFORD. Tulane Univ. Sch. of Med. and Louisiana Office of Publ. Health Lab., New Orleans.
- D7.** Influence of BCG-Polysaccharide Nucleic Acid, Gamma Interferon, and Dead BCG on the Multiplication of Mycobacteria Phagocytosed by Mouse Peritoneal Macrophages. W.-Q. ZHAO. Hunan Med. Univ., Changsha, Hunan, Peoples Republic of China.
- D8.** Growth of *Neisseria gonorrhoeae* in Cytidine Monophosphate *N*-Acetyl-Neuraminic Acid Inhibits Its Nonopsonic Interactions with Human Neutrophils. R. F. REST,\* M. DRONSFELD, and J. V. FRANGIPANE. Hahnemann Univ. Sch. of Med., Philadelphia, Pa.

10:30

- D9.** Adherence and Uptake of Slime-Producing *Staphylococcus epidermidis* by Human Polymorphonuclear Cells Quantitated by Flow Cytometry. C. C. PATRICK,\* J. A. HOUSTON, S. V. HETHERINGTON, and S. HENWICK. St. Jude Children's Res. Hosp., Memphis, Tenn.
- D10.** CI-983 (Cefdinir) Has Different Effects on Polymorphonuclear Neutrophil Oxidative Burst Triggered by Soluble and Particulate Stimuli. M. T. LABRO\* and J. EL BENNA. INSERM U.294, Paris, France.

### Session 12 (B)

#### GENETIC REGULATION OF THE SYNTHESIS OF FIMBRIAE

Wednesday, 8:30 A.M., Room 5

*Moderators:* DAVID HONE, Univ. of Maryland, Baltimore, and STEVEN L. MOSELEY, Dept. of Microbiology, Univ. of Washington, Seattle

8:30

- B1.** Evidence that DNA Rearrangement Is a Mechanism of Phase Variation of Enterotoxigenic *Escherichia coli* CFA/I Fimbriae. T. H. LIU,\* T. K. KARJALAINEN, D. G. EVANS, D. J. EVANS, JR., and C. H. LEE. Indiana Univ., Indianapolis, and Baylor Col. of Med., Houston, Tex.
- B2.** A Cryptic Gene, *cfuD'*, Can Positively Regulate CFA/I Expression in *Escherichia coli*. J.-G. XU,\* D. R. MANEVAL, M. M. LEVINE, and D. M. HONE. Div. of Geographic Med., Dept. of Med., Univ. of Maryland Sch. of Med., Baltimore, and Dept. of Microbiology, Inst. of Epidemiology and Microbiol., Chinese Academy of Preventive Med., Beijing, China.
- B3.** Functional Expression of Heterologous Fimbrial Subunits by the F41, K88, and CS31A Determinants of *Escherichia coli*. M. J. KORTH,\* J. M. APOSTOL, JR., and S. L. MOSELEY. Univ. of Washington, Seattle.
- B4.** Transcriptional Organization of the *Escherichia coli* K99 Operon. R. ISAACSON\* and O. INOUE. Dept. of Vet. Pathobiology, Univ. of Illinois, Urbana.

9:30

- B5.** Molecular Analysis of the Accessory Colonization Factor Gene Cluster of *Vibrio cholerae*. K. EVERISS,\* C. HARKEY, K. HUGHES, M. KOVACH, and K. PETERSON. Louisiana State Univ. Med. Ctr., Shreveport.
- B6.** Expression of Curli Is Under Phase Variation in *Salmonella enteritidis* and *Salmonella typhimurium*. C. ERICSON,\* A. OLSEN, and S. NORMARK. Dept. of Molecular Microbiol., Washington Univ., Sch. of Med., St. Louis, Mo.
- B7.** Mannose-Resistant Hemagglutination and Fibronectin Binding by Avian Pathogenic *Escherichia coli*. D. L. PROVENCE. Washington Univ., St. Louis, Mo.
- B8.** The *Bordetella pertussis* Filamentous Hemagglutinin and Fimbriae Share Common Accessory Genes with Sequence Similarities to the *papD* and *papC* Gene Families. C. LOCHT,\* M.-C. GEOFFROY, and G. RENAULD. Inst. Pasteur, Lille, France.

10:30

- B9.** Isolation of MR/P Fimbrial Gene Sequences from Uropathogenic *Proteus mirabilis*. F. K. BAHRANT,\* D. EDELMAN, R. MCDUFF, and L. T. MOBLEY. Univ. of Maryland Sch. of Med., Baltimore.
- B10.** DNA Sequence of the *Yersinia pestis* pH 6 Antigen. L. E. LINDLER\* and W. E. HERMAN. Walter Reed Army Inst. of Res., Washington, D.C.
- B11.** A Two-Component Regulatory System Controls Expression of the *Pseudomonas aeruginosa* Pilin Gene. J. BOYD,\* T. KOGA, K. ISHIMOTO, and S. LORY. Univ. of Washington, Seattle.

### Session 13 (F). Seminar

(Eligible for continuing education credit)

#### EMERGING OPPORTUNISTIC FUNGAL INFECTIONS

Wednesday, 8:30 A.M., Room 21

*Convenors:* THOMAS J. WALSH, Nat. Cancer Inst., Bethesda, Md., and WILLIAM G. MERZ, Johns Hopkins Hosp., Baltimore, Md.

Newer Implications for the Pathogenesis and Treatment of Cryptococcosis

JOHN PERFECT, Duke Univ. Med. Ctr., Durham, N.C.

Antigen-Based Approaches to Diagnosis of Invasive Aspergillosis

THOMAS PATTERSON, Yale Univ., New Haven, Conn.

New Insights into the Pathogenesis, Diagnosis, and Treatment of Infections Due to *Trichosporon*

THOMAS J. WALSH, Nat. Cancer Inst., Bethesda, Md.

Problems and Challenges of Hyalohyphomycosis Due to *Fusarium*

ELIAS J. ANAISSIE, Univ. of Texas, M.D. Anderson Cancer Ctr., Houston

Role of Melanin in the Pathogenesis of Dematiaceous Fungi

DENNIS DIXON, New York State Dept. of Health, Albany

**Session 14 (U). Seminar**  
(Eligible for continuing education credit)

**WHAT MYCOBACTERIOLOGISTS CAN  
LEARN FROM STUDIES ON OTHER  
PATHOGENS**

Wednesday, 8:30 A.M., Room 27

Convenors: JOSEPHINE E. CLARK-CURTISS, Washington Univ., St. Louis, Mo., and THOMAS M. SHINNICK, CDC, Atlanta, Ga.

Molecular Mechanisms of *Salmonella* Invasion into Cultured Epithelial Cells  
JORGE GALAN, SUNY Stony Brook, Stony Brook, N.Y.

Mechanisms of Cell Entry by *Legionella* and *Mycobacteria*  
MARCUS HORWITZ, UCLA Sch. of Med., Los Angeles, Calif.

Genetic Analysis of Another Facultative Intracellular Bacterial Pathogen (*Listeria monocytogenes*)  
DANIEL PORTNOY, Univ. of Pennsylvania Sch. of Med., Philadelphia

Adenylate Cyclase Toxin of *Bordetella pertussis*  
ERIK HEWLETT, Univ. of Virginia Sch. of Med., Charlottesville

Macrophage Killing Processes  
JAMES KRAHENBUHL, Nat. Hansen's Disease Ctr., Carville, La.

Iron Assimilation in the Pathogenesis of *Shigella*  
SHELLEY PAYNE, Univ. of Texas, Austin

**Session 15 (I)**

**MICROBIAL GROWTH**

Wednesday, 8:30 A.M., Room 36

Moderators: M. J. MCINERNEY, Univ. of Oklahoma, Norman, and W. R. KENEALY, Univ. of Wisconsin, Madison

8:30

11. Growth and Buoyant Density of *Escherichia coli* at Very Low Osmolarities. W. W. BALDWIN,\* R. MYER, T. KUNG, and A. L. KOCH. Indiana Univ. Sch. of Med., NWCME, Gary, and Indiana Univ., Bloomington.
12. Realized Models of Blooms and of Critical D in Constant-Volume Perpetual Cultures. J. S. POINDEXTER\* and T. W. P. CHEUNG. Barnard Col., Columbia Univ., New York, N.Y.
13. Competitive Dominance by Motile *Pseudomonas fluorescens* in Dual-Dilution Continuous Culture and Batch Culture. D. R. KORBER, J. R. LAWRENCE, and D. E. CALDWELL.\* Univ. of Saskatchewan and NHRI, Environment Canada, Saskatoon, Saskatchewan, Canada.
14. Fractal Growth Model of *Bacillus pumilus* LM7 Colony. J. SCHINDLER\* and T. RATAJ. Inst. of Hygiene and Epidemiology, Prague, Czechoslovakia.

9:30

15. Physical-Chemical Studies of Culturable/Nonculturable *Enterobacteriaceae*. H.-W. CHENG,\* M. A. GEALT, and B. P. SAGIK. Dept. of Biosci. and Biotechnology, Drexel Univ., Philadelphia, Pa.
16. Effects of Temperature and Hydrostatic Pressure on the Growth of Psychrophiles from Sea Sediment Samples. T. HAMAMOTO\* and K. HORIKOSHI. Riken Inst. and Deepstar Group, JAMSTEC, Saitama, Japan.
17. Energetics and Kinetics of Anaerobic Benzoate Degradation. V. WARIKOO\* and M. J. MCINERNEY. Univ. of Oklahoma, Norman.
18. Catabolic Strategies of the Rumen Anaerobe *Succinivibrio dextrinosolvens*. S. M. O'HERRIN\* and W. R. KENEALY. Univ. of Wisconsin, Madison.

10:30

19. Effect of Carbon Availability on the Metabolism of *Bifidobacterium breve* Grown in Continuous Culture. B. A. DEGNAN, G. R. GIBSON,\* and G. T. MACFARLANE. MRC Dunn Clin. Nutrition Ctr., Cambridge, U.K.
110. Propionate and Butyrate Degradation in Granules from a Thermophilic UASB Reactor Degrading Acetate, Propionate, and Butyrate. J. E. SCHMIDT\* and B. K. AHRING. Technical Univ. of Denmark, Lyngby, Denmark.
111. Thermophilic Anaerobes That Can Grow under Alkaline Conditions. Y. LI. Dept. of Microbiol. and Ctr. for Biol. Resource Recovery, Univ. of Georgia, Athens.
112. Modulation of Gram-Negative Bacterial Growth by Catecholamines. M. LYTE\* and S. ERNST. Mankato State Univ., Mankato, Minn.

**Session 16 (U)**

**NEW METHODS FOR THE DIAGNOSIS OF  
MYCOBACTERIAL INFECTIONS**

Wednesday, 8:30 A.M., Room 93

Moderators: KATHLEEN D. EISENACH, Univ. of Arkansas for Med. Sci., Little Rock, and ANNE B. MORRISSEY, Univ. Hosp., Case Western Reserve Univ., Cleveland, Ohio

8:30

- U1. Direct Detection of *Mycobacterium tuberculosis* in Sputum Using the Polymerase Chain Reaction. F. NOLTE,\* B. METCHOCK, A. EDWARDS, O. OKWUMABUA, and T. SHINNICK. Emory Univ. and CDC, Atlanta, Ga.
- U2. Routine Application of DNA Amplification for Tuberculosis Diagnosis. F. DOUCET-POPULAIRE,\* L. MAURY, C. TRUFFOT, and J. GROSSET. Pitié-Salpêtrière Sch. of Med., Paris, France.
- U3. Application of DNA Fingerprinting to Epidemiologic Studies of *Mycobacterium tuberculosis*. C. L. WOODLEY\* and J. T. CRAWFORD. CDC, Atlanta, Ga.
- U4. Characterization of Novel Sequences for the Identification of *Mycobacteria* by DNA Hybridization and Polymerase Chain Reaction Amplification. P. A. SPEARS,\* D. D. SHANK, P. T. HAMILTON, R. E. PEARSON, and D. P. MALINOWSKI. Molecular Biol. Dept., Becton Dickinson Res. Ctr., Research Triangle Park, N.C.

WEDNESDAY

9:30

- U5. Strain-Specific Comparison of *Mycobacterium avium-intracellulare* Isolates Using Large Restriction Fragment Patterns. G. H. MAZUREK,\* Y. ZHANG, V. A. STEINGRUBE, D. T. MURPHY, J. S. R. HECTOR, and R. J. WALLACE, JR. Univ. of Texas Health Ctr., Tyler.
- U6. Evaluation of a Newly Designed Commercially Available Chemiluminescent DNA Probe for the Identification of *Mycobacterium avium-intracellulare* Complex. L. STOCKMAN,\* G. D. ROBERTS, and V. JONAS-TAGGART. Mayo Clin. and Mayo Fndn., Rochester, Minn., and Gen-Probe, San Diego, Calif.
- U7. Detection of *Mycobacterium avium* Complex Strains by Using Acridinium Ester-Labeled DNA Probes. V. JONAS,\* C. KNOTT, D. P. HENDERSON, S. J. SNEAD, and N. G. WARREN. Gen-Probe Inc., San Diego, Calif., and Commonwealth of Virginia, Richmond.
- U8. Field Evaluation of Reverse-Phase High-Performance Liquid Chromatography for Mycobacteria Identification. L. THIBERT\* and S. LAPIERRE. Quebec Publ. Health Lab., Ste-Anne-de-Bellevue, Quebec, Canada.

10:30

- U9. High-Performance Liquid Chromatography of Mycolic Acid Esters among *Mycobacterium avium-intracellulare-scrofulaceum* Complex: Subgrouping of Profiles and Relationship to DNA Probe Results. V. A. SILCOX,\* M. M. FLOYD, and C. L. WOODLEY. CDC, Atlanta, Ga.
- U10. Accuracy and Utility of Four Serological Tests, Two Culture Techniques, and a Polymerase Chain Reaction-DNA Probe for Diagnosis and Control of Bovine Paratuberculosis. M. T. COLLINS\* and D. C. SOCKETT. Sch. of Vet. Med., Univ. of Wisconsin, Madison.
- U11. Evaluation of a Commercial Kit in the Diagnosis of Mycobacterial Disease in a Routine Laboratory. R. WASSSELL,\* P. A. LOWE, P. B. ILES, and R. WISE. Dudley Road Hosp., Birmingham, U.K.

## Session 17 (E)

### IMMUNE RESPONSES TO MICROBES: LYMPHOCYTE SUBSETS, STRESS PROTEINS, AND SUPERANTIGENS

Wednesday, 8:30 A.M., Room 1

Moderators: THOMAS W. KLEIN, Univ. of South Florida Col. of Med., Tampa, and MALAK KOTB, VA Med. Ctr. and Univ. of Tennessee, Memphis

8:30

- E1. Alterations in Lymphocyte Subsets following Primary and Secondary Infection of Mice with *Legionella pneumophila*. R. WIDEN,\* C. NEWTON, J. SMITH, T. KLEIN, and H. FRIEDMAN. Univ. of South Florida, Tampa.
- E2. Depletion of CD4<sup>+</sup> T Cells, but Not Inhibition of the Activity of Gamma Interferon, Prevents Cure of Toxoplasmosis in Mice. F. G. ARAUJO. Res. Inst., Palo Alto Med. Fndn., Palo Alto, Calif.
- E3. In Vivo Elimination of Immune Cell Populations Decreases Mortality from Intracerebral Rabies Challenge. P. WUNDERLI,\* J. SHADDOCK, M. FEKADU, T. MILLER, G. BAER,

and D. DREESEN. Univ. of Georgia, Athens; CDC, Atlanta, Ga.; and SmithKline Beecham, King of Prussia, Pa.

- E4. Phytochemicals Potentiate Interleukin-2-Generated LAK Cell Cytotoxicity. B. H. S. LAU,\* Y. WANG, X. J. QIAN, and H. R. HADLEY. Loma Linda Univ. Med. Sch., Loma Linda, Calif.

9:30

- E5. Phenotypic and Functional Characteristics of Lymphocytes from Cyclosporine-Treated *Leishmania major*-Infected Mice. K. SOUTHERN,\* L. GREEN, and N. C. BEHFOROUZ. Dept. of Biol., Ball State Univ., Muncie, Ind.
- E6. Infection of Macrophages with Virulent *Legionella pneumophila* Induces Phosphorylation of a 76-kDa Protein. Y. YAMAMOTO,\* T. KLEIN, H. SHINOMIYA, M. NAKANNO, and H. FRIEDMAN. Univ. of South Florida, Tampa, and Jichi Med. Sch., Tochigi, Japan.
- E7. *Legionella pneumophila* Stress Protein Hsp60: In Vivo Expression and Cellular Immunity. P. S. HOFFMAN,\* S. M. LOGAN, R. WEERATNA, R. FERNANDEZ, D. HOSKIN, and M. RIPLEY. Dalhousie Univ., Halifax, Nova Scotia, Canada.
- E8. Mapping Antigenic Sites with Synthetic Peptides on the *Chlamydia trachomatis* Heat Shock Protein 60. Y. YI,\* G. ZHONG, and R. C. BRUNHAM. Univ. of Manitoba, Winnipeg, Manitoba, Canada.

10:30

- E9. Distinct T-Cell Receptor V $\beta$  Gene Usage by Human T Lymphocytes Stimulated with the Streptococcal Pyrogenic Exotoxins and M Protein. M. TOMAI,\* P. M. SCHLIEVERT, and M. KOTB. Univ. of Tennessee and VA Med. Ctr., Memphis, and Univ. of Minnesota, Minneapolis.
- E10. Temporal Relationship of Cytokine Release by Peripheral Blood Mononuclear Cells Stimulated by the Streptococcal Superantigen Pep M5. M. KOTB,\* G. MAJUMDAR, S. HACKETT, A. BRYANT, and D. STEVENS. Univ. of Tennessee and VA Med. Ctr., Memphis, and VA Med. Ctr., Boise, Idaho.
- E11. Stimulation of Functionally Distinct T Cells by Pep M Proteins from Two Different Rheumatogenic Serotypes Is Reflected in Their Ability To Interact with Specific V $\beta$  Elements of the T-Cell Receptor. M. KOTB,\* R. OHNISHI, and M. TOMAI. Univ. of Tennessee and VA Med. Ctr., Memphis.

## Session 18 (S)

### VIRAL GENE EXPRESSION

Wednesday, 8:30 A.M., Room 80

Moderators: RONALD B. LUFTIG, Louisiana State Univ. Med. Ctr., New Orleans, and X.-Y. ZHANG, Tulane Med. Sch., New Orleans, La.

8:30 Divisional Lecture

(Eligible for continuing education credit)

Functional Consequences of Oncogene-Antioncogene Interaction  
JOSEPH R. NEVINS, Howard Hughes Med. Inst., Duke Univ. Med. Ctr., Durham, N.C.

9:30

- S1. Expression of Hepatitis B Surface Antigen from a Transient Expression Vector Containing Simian Adenovirus Major Late Promoter and Tripartite Leader. C. L. HSIAO,\* K. J. WOESSNER, S. G. LEE, and P. P. HUNG. Div. of Biotechnology and Microbiol., Wyeth-Ayerst Res., Radnor, Pa.
- S2. Human Adenovirus Type 41 Fiber Genes and Their Expression in Infected HEP-2 cells. H-Y. YEH,\* N. PIENIAZEK, D. PIENIAZEK, C. DALILI, and R. B. LUFTIG. Louisiana State Univ. Med. Ctr., New Orleans, and CDC, Atlanta, Ga.
- S3. Activation of *c-jun* and  $\alpha$ -Fetoprotein Genes by the X-Gene Product of Human Hepatitis B Virus. M. ZHOU,\* G. GOODARZI, M. WATABE, and K. WATABE. Southern Illinois Univ. Sch. of Med., Springfield.
- S4. Characterization of Transformed Cell Lines Expressing Regulatory Genes of Varicella-Zoster Virus. H. MORIUCHI,\* M. MORIUCHI, S. E. STRAUS, and J. I. COHEN. Nat. Inst. of Allergy and Infectious Diseases, Bethesda, Md.

10:30

- S5. Identification and Functional Analyses of the UL1 and UL2 Polypeptides of Equine Herpesvirus 1. R. N. HARTY,\* R. H. SMITH, and D. J. O'CALLAGHAN. Louisiana State Univ. Med. Ctr., Shreveport.
- S6. Virion-Associated Transcription Modulators of Bovine Herpesvirus Type 1. V. MISRA\* and D. E. CARPENTER. Univ. of Saskatchewan, Saskatoon, Saskatchewan, Canada.
- S7. Differential Recruitment of Infiltrating Lymphocytes during Central Nervous System Infection with Latent and Active Strains of Herpes Simplex Virus Type 1. G. A. LEWANDOWSKI,\* D. LO, and F. E. BLOOM. Scripps Res. Inst., La Jolla, Calif.
- S8. Down-Regulation of the Human Cytomegalovirus Major Immediate Early Promoter by MDBP Binding to a Sequence 5 bp after the Cap Site. X.-Y. ZHANG,\* C. K. ASIEDU, F. N. A. SACKEY, and M. EHRLICH. Tulane Med. Sch., New Orleans, La.

11:30

- S9. Lipid Modification of Vaccinia Virus Proteins. D. HRUBY\* and C. FRANKE. Oregon State Univ., Corvallis.

### Session 19 (Q). Seminar

(Eligible for continuing education credit)

## ASSESSING THE USE OF NONINDIGENOUS MICROORGANISMS IN BIOREMEDIATION I

Wednesday, 8:30 A.M., Room 19

Convenors: MICHAEL V. WALTER, Texaco Inc., Glenham, N.Y., and JAMES G. MUELLER, SBP Inc., Atlanta, Ga.

Survival of Nonindigenous Microorganisms in the Environment  
KELLY DONEGAN and R. J. SEIDLER, Mantech Environmental Services, U.S. EPA, Corvallis, Oreg.

Environmental Release of Nonindigenous Bioremediation Organisms: How Do We Assess Environmental Release?  
BILL FENDER, Kansas State Univ. and U.S. EPA, Corvallis, Oreg.

Use of Microbial Activity To Remove Mercury from Contaminated Water

TAMAR BARKDY and RALPH TURNER, ERL, Gulf Breeze, Fla.

Immobilized Pure Bacterial Cultures for Detoxification of Agricultural Chemical Residues

JULIA HULTMAN, TIMOTHY STEVENS, and RON CRAWFORD, Univ. of Idaho, Moscow

### Session 20 (G). Seminar

(Eligible for continuing education credit)

## MOLECULAR BIOLOGY OF MYCOPLASMAS

Wednesday, 8:30 A.M., Room 33

Convenors: ALAIN BLANCHARD, Univ. of Alabama, Birmingham, and CHRIS F. MINION, Iowa State Univ., Ames

*Mycoplasma recA* Genes

KEVIN DYBVG, Univ. of Alabama, Birmingham

Molecular Genetic Basis of Mycoplasma Surface Antigenic Variation

KIM S. WISE, Univ. of Missouri, Columbus

A Novel Translation Initiation Region from *Mycoplasma genitalium* That Functions in *Escherichia coli*

PING-CHUAN HU, Univ. of North Carolina, Chapel Hill

Construction and Use of Promoter Probe Vectors in Mycoplasmas

KEVIN L. KNUDTSON, Iowa State Univ., Ames

Development and Use of Mycoplasma Cloning Vectors

KENDALL W. KING, Univ. of Alabama, Birmingham

### Session 21 (P). Seminar

(Eligible for continuing education credit)

## RECENT ADVANCES IN THE RECOVERY OF FOOD-BORNE PATHOGENS

Wednesday, 8:30 A.M., Room 97

Convenors: STEPHEN KNABEL, Pennsylvania State Univ., University Park, and CATHERINE DONNELLY, Univ. of Vermont, Burlington

Microbial Injury: Does It Have a Future in Food Microbiology?  
BIBEK RAY, Univ. of Wyoming, Laramie

Resuscitative Recovery of Injured Food-Borne *Salmonella* Organisms  
WALLACE ANDREWS, FDA, Washington, D.C.

Presence of Viable but Nonculturable *Vibrio vulnificus* in Oysters  
JAMES OLIVER, Univ. of North Carolina, Charlotte

Injury and Repair of *Listeria monocytogenes* following Exposure to Heat, Freezing, and Sanitizers  
CATHERINE DONNELLY, Univ. of Vermont, Burlington

WEDNESDAY

Optimizing the Recovery of Heat-Injured *Listeria monocytogenes* from Foods

STEPHEN KNABEL, Pennsylvania State Univ., University Park

Recovery of Bacterial Pathogens from Foods for Detection by Modern, Rapid Assays

MICHAEL CURIALE, Silliker Labs. Group Inc., Chicago Heights, Ill.

### Session 22 (O). Seminar

(Eligible for continuing education credit)

## ADVANCES IN MOLECULAR GENETICS OF SECONDARY METABOLISM

Wednesday, 8:30 A.M., Room 82

Convenors: DEEPAK BHATNAGAR and THOMAS E. CLEVELAND, USDA, Agricultural Res. Service, Southern Regional Res. Ctr., New Orleans, La.

Enzymes of Macrolide Antibiotic Biosynthesis in Bacteria  
C. RICHARD HUTCHINSON, Univ. of Wisconsin, Madison

Molecular Regulation of Aflatoxin Biosynthetic Pathway  
D. BHATNAGAR, J. W. CARY, G. A. PAYNE, N. P. KELLER, and T. E. CLEVELAND, USDA, Agricultural Res. Service, Southern Regional Res. Ctr., New Orleans, La., and North Carolina State Univ., Raleigh

A Molecular Genetic Approach to Understanding Aflatoxin B<sub>1</sub> Biosynthesis in *Aspergillus parasiticus*  
JOHN E. LINZ, Michigan State Univ., E. Lansing

Molecular Genetics of Erythromycin Biosynthesis  
LEONARD KATZ, Abbot Lab., Abbot Park, Ill.

Molecular Genetics of Cyclic Peptide Synthesis in the Maize Pathogen *Cochliobolus carbonum*  
J. S. SCOTT-CRAIG, D. G. PANACCIONE, and J. D. WALTON, Michigan State Univ., E. Lansing

Genetics of Trichothecene Biosynthesis in *Fusarium*  
A. E. DESJARDINS, T. M. HOHN, and S. P. MCCORMICK, USDA, Agricultural Res. Service, NCAUR, Peoria, Ill.

### Session 23 (N). Seminar

(Eligible for continuing education credit)

## MICROBIOLOGICALLY INFLUENCED CORROSION

Wednesday, 8:30 A.M., Room 87

Convenors: TIM FORD, Harvard Univ., Cambridge, Mass., and MARC MITTELMAN, Univ. of Tennessee, Knoxville

Role of Biofilm: Microenvironment Mosaic Structures in Microbially Induced Corrosion

C. W. KEEVIL, PHLS Ctr. for Applied Microbiol. and Res., Porton Down, Salisbury, Wiltshire, U.K.

Mineralogical Fingerprints for Microbially Influenced Corrosion  
BRENDA LITTLE, Naval Oceanographic and Atmospheric Res. Lab., Stennis Space Center, Miss.

Effects of Biofilm Processes on the Integrity of Thin Metal Films  
GILL GEESEY and PHILIP J. BREMER, Montana State Univ., Bozeman

Microbiologically Influenced Deterioration of Coated Metals  
MARIANNE WALCH and JOANNE M. JONES, Naval Surface Warfare Ctr., Silver Spring, Md.

Methods for Localizing Electrochemical and Microbial Activity in MIC

J. GUEZENNEC and DAVID C. WHITE, Univ. of Tennessee, Knoxville

### Session 24 (J). Seminar

(Eligible for continuing education credit)

## STRUCTURE AND FUNCTION OF BACTERIAL "COMPARTMENTS"

Wednesday, 8:30 A.M., Room 38

Convenors: S. F. KOVAL, Univ. of Western Ontario, London, Ontario, Canada, and G. D. SPROTT, Nat. Res. Council of Canada, Ottawa, Ontario, Canada

"Compartments" in the Bacterial Cell and Their Enzymes

F. MAYER, Georg-August-Univ. Göttingen, Göttingen, Germany

Periplasmic Space and the Concept of the Periplasm

T. J. BEVERIDGE and L. L. GRAHAM, Univ. of Guelph, Guelph, Ontario, Canada

Buoyancy and Its Regulation in Gas-Vacuolate Cyanobacteria  
A. E. KONOPKA, Purdue Univ., West Lafayette, Ind.

Photosynthetic Membrane Complexes and Membrane Structure in *Rhodobacter sphaeroides*

S. KAPLAN, Univ. of Texas Med. Sch., Houston

## POSTER SESSIONS

Wednesday, 9:00-10:30 A.M., Exhibit Hall C

(Board numbers in parentheses)

### Session 25 (Q). WATER QUALITY

Q1. Bacteriological Analysis of Swimming Pool Waters in Mexico City. (001) P. RAMIREZ,\* B. MARTINEZ, E. ROBLES, A. DURAN, and V. RIVERA. ENEP-Iztacala, UNAM, Mexico.

Q2. Use of Bacterial Indicators To Monitor the Movement of Sewage Discharged into the Ocean. (003) C. WU,\* R. FUJIOKA, and C. FUJIOKA. Univ. of Hawaii, Honolulu.

Q3. Assessing the Recreational Quality and Sources of Fecal Indicator Bacteria in Kaelepulu Stream, Hawaii. (005) B. ROLL\* and R. FUJIOKA. Univ. of Hawaii, Honolulu.

Q4. Inactivation of *Vibrio cholerae* Biotype El Tor and Biotype Classical by Chlorination. (007) C. H. JOHNSON, M. E.

- DUNNIGAN, E. W. RICE,\* and D. J. REASONER. U.S. EPA, Cincinnati, Ohio.
- Q5.** Removal of Biological and Chemical Challenge from Water by Commercial Fresh- and Salt-Water Purification Devices. (009) E. POWERS. U.S. Army Natick RD&E Ctr., Natick, Mass.
- Q6.** Enhanced Inactivation of *Escherichia coli* and Coliphage MS-2 by a Combined System of Chloramine and Copper Chloride. (011) M. T. YAHYA,\* X. ZHOU, and C. P. GERBA. Los Angeles Sanitation Districts, Whittier, Calif., and Dept. of Microbiol. and Immunol., Univ. of Arizona, Tucson.
- Q7.** Bacterial Contamination in Bottled Water Dispensers. (013) L. KOZLOWSKI, T. GORRELL, J. NOLL, and F. ROSENBERG.\* Dept. of Biol., Northeastern Univ., Boston, Mass., and EPCO, Inc., Woodbury, Conn.
- Q8.** Characterization of Heat-Resistant Bacteria Isolated from the Water Recycle System Being Developed for Space Station Freedom. (015) K. COOK,\* D. HOLDER, M. ROMAN, and J. J. GAUTHIER. NASA/Marshall Space Flight Ctr., Huntsville, Ala., and Univ. of Alabama, Birmingham.
- Q9.** UV Susceptibility Comparison of Waterborne Pathogens and Indicator Microorganisms. (017) P. ROESSLER,\* M. ABBASZADEGAN, C. P. GERBA, B. WILSON, and E. VAN DELLEN. Amway Corp., Ada, Mich., and Univ. of Arizona, Tucson.
- Q10.** UV Dose Bioassay Using Coliphage MS-2. (019) B. WILSON,\* P. ROESSLER, M. ABBASZADEGAN, C. P. GERBA, and E. VAN DELLEN. Amway Corp., Ada, Mich., and Univ. of Arizona, Tucson.
- Q11.** Isolation of Pathogenic Free-Living Amebae from Oklahoma Waters. (021) M. J. HOWARD\* and D. T. JOHN. Col. of Osteopathic Med., Oklahoma State Univ., Tulsa.
- Q12.** Use of an Enzyme-Linked Immunosorbent Assay for *Giardia lamblia* Detection in Environmental Samples. (023) R. E. DANIELSON,\* S. MING-LEE, and B. R. TAMPLIN. California Dept. of Health Services, Sanitation and Radiation Lab., Berkeley.
- Q13.** Detection of *Giardia* Cysts by RNA Polymerase Chain Reaction in Water Samples Using a Low-pH Phenol-Chloroform Extraction. (025) M. S. HUBER,\* I. L. PEPPER, and M. ABBASZADEGAN. Univ. of Arizona, Tucson.
- Q14.** Biocide-Induced Encystment of Amoebae and Ciliates from a Cooling Tower. (027) E. E. SUTHERLAND and S. G. BERK.\* Tennessee Technological Univ., Cookeville.
- Q15.** Relationship between Treatment of *Giardia*, Cryptosporidium, Turbidity, and Particle Counts. (029) W. D. NORTON\* and M. W. LECHEVALLIER. American Water Works Service Co., Inc., Belleville, Ill.
- Q16.** Field Evaluation of Water Quality in Malawi Using the Colilert System and Its Use in the Prevention of Diarrheal Disease. (031) S. C. EDBERG,\* M. R. RIGGS, H. J. MCLEAN-RIGGS, M. BARRY, G. BURNHAM, and M. J. ALLEN. Yale Univ. Sch. of Med., New Haven, Conn., and American Water Works Association Res. Fndn, Denver, Colo.
- Q17.** Evaluation of the ENVIROAMP Polymerase Chain Reaction *Legionella* Test Kit. (033) J. MITTELMAN,\* E. BOWMAN, and R. TYNDALL. A. & G. Technical Associates, Knoxville, Tenn., and Oak Ridge Nat. Lab., Oak Ridge, Tenn.
- Q18.** Fecal Indicator and Pathogenic Bacteria in the Feces of Humans, Animals, and Birds. (035) E. HARRIS, M. YOUNG, and P. L. SEYFRIED.\* Lake Simcoe Conservation Authority, Newmarket, Ontario, Canada, and Ministry of the Environment and Univ. of Toronto, Toronto, Ontario, Canada.
- Q19.** Detection of *Salmonella typhimurium* Containing a P22 Prophage in a Laboratory-Scale Waste Treatment Microcosm. (037) M. A. GEALT, W. B. BAROLETTI, L.-L. CHANG,\* C. KOKOLIS, and B. P. SAGIK. Dept. of Biosci. and Biotechnology, Drexel Univ., Philadelphia, Pa.
- Q20.** Specific Detection of *Salmonella* spp. by Polymerase Chain Reaction. (039) J. WAI,\* K. L. JOSEPHSON, S. C. PILLAI, and I. L. PEPPER. Dept. of Soil and Water Sci., Univ. of Arizona, Tucson.
- Q21.** Improved Method of Coliphage Detection Based on  $\beta$ -Galactosidase Induction. (041) M. M. IJZERMAN,\* C. HAGEDORN, and B. RENEAU, JR. Virginia Polytechnic Inst. and State Univ., Blacksburg.
- Q22.** Influence of Sediments on the Survival of *Escherichia coli* as Measured by Three Methods of Enumeration. (043) J. T. FISH and G. W. PETTIBONE.\* SUNY at Buffalo, Buffalo, N.Y.
- Q23.** Virus Removal from Sewage Effluents during Percolation through Sandy Alluvium. (045) D. K. POWELSON\* C. P. GERBA, and M. T. YAHYA. Univ. of Arizona, Tucson, and Los Angeles Sanitation Districts, Whittier, Calif.
- Q24.** Use of Bioluminescent Marine Bacteria To Detect Potentially Biohazardous Materials in Water. (047) D. MCGEE\* and K. THOMULKA. Philadelphia Col. of Pharmacy and Sci., Philadelphia, Pa.

### Session 26 (Q). BIOTRANSFORMATION AND DEGRADATION I: AROMATICS AND HALOGENATED AROMATICS

- Q25.** Effect of Temperature on the Anaerobic Transformation of 2,3,4,6-Tetrachlorobiphenyl in Methanogenic Pond Sediment Slurries. (049) Q. WU, D. BEDARD, and J. WIEGEL.\* Dept. of Microbiol. and Ctr. for Biol. Resource Recovery, Univ. of Georgia, Athens, and GE-Res. and Development Ctr., Schenectady, N.Y.
- Q26.** Brominated Biphenyls Can Stimulate Reductive Dechlorination of Endogenous Aroclor 1260 in Methanogenic Sediment Slurries. (051) D. L. BEDARD\* and H. M. VAN DORT. GE Res. and Development Ctr., Schenectady, N.Y.
- Q27.** Effect of Polychlorinated Biphenyls Addition on Anaerobic Bacterial Populations in Hudson River Sediment Enrichments. (053) W. A. PRICE II,\* A. L. BOYLE, H. D. MAY, and C. BLAKE. Celgene Corp., Warren, N.J.
- Q28.** Dechlorination of Polychlorinated Biphenyls with Hudson River Bacterial Cultures under Anaerobic Conditions: Effect of Sulfate, Sulfite, and Nitrate. (055) H. D. MAY,\* A. W. BOYLE, W. A. PRICE II, and C. K. BLAKE. Celgene Corp., Warren, N.J.
- Q29.** Rapid and Sustained *meta*-Dechlorination of 2,3,6-Trichlorobiphenyl under Anaerobic Conditions. (057) A. W. BOYLE,\* W. A. PRICE II, C. K. BLAKE, and H. D. MAY. Celgene Corp., Warren, N.J.
- Q30.** Anaerobic Polychlorinated Biphenyls Dechlorination in the Absence of River Sediment. (059) C. K. BLAKE,\* W. A. PRICE II, and H. D. MAY. Celgene Corp., Warren, N.J.
- Q31.** Reductive Dechlorination of Three Highly Chlorinated Polychlorinated Biphenyl (PCB) Congeners by Sediments from a PCB-Contaminated Great Lakes Site. (061) D. A. WUBAH\* and J. E. ROGERS. Univ. of Georgia and U.S. EPA, Athens.
- Q32.** Environmental Factors Affecting Reductive Dechlorination of Chlorinated Aromatics by Microorganisms or Vitamin B<sub>12</sub>. (063) L. NIES\* and T. M. VOGEL. Univ. of Michigan, Ann Arbor.
- Q33.** Occurrence of Polychlorinated Biphenyls (PCB)-Dechlorinating Microorganisms and Factors Influencing the Extent of PCB Dechlorination. (065) J. F. QUENSEN III\* and S. A. BOYD. Michigan State Univ., East Lansing.
- Q34.** Characterization of Genes Involved in 2,4,5-Trichlorophenoxyacetic Acid Degradation by *Pseudomonas cepacia*

- AC1100. (067) D. DAUBARAS,\* K. KITANO, and A. M. CHAKRABARTY. Univ. of Illinois, Chicago.
- Q35. Biodegradation of 2,4-Dichlorophenoxyacetic Acid in Batch and Column Experiments under Different Soil Moisture Conditions. (069) R. ESTRELLA,\* M. L. BRUSSEAU, P. J. WIERENGA, and R. M. MILLER. Univ. of Arizona, Tucson.
- Q36. Gene Probe Analysis of Competition among 2,4-Dichlorophenoxyacetic Acid-Degrading Bacteria in Soil under Selective Conditions. (071) J. O. KA,\* W. E. HOLBEN and J. M. TIEDJE. Michigan State Univ., East Lansing.
- Q37. Characterization and Classification of Diverse 2,4-Dichlorophenoxyacetic Acid-Degrading Populations Using Whole Plasmid Probes in Colony Hybridization Analyses. (073) V. G. M. CALABRESE, N. L. TONSO, A. J. SEXSTONE, and W. E. HOLBEN.\* West Virginia Univ., Morgantown, and Michigan State Univ., East Lansing.
- Q38. Polyphasic Taxonomic Characterization of Diverse 2,4-Dichlorophenoxyacetic Acid-Degrading Populations of Soils. (075) N. L. TONSO,\* V. G. M. CALABRESE, and W. E. HOLBEN. Michigan State Univ., East Lansing, and West Virginia Univ., Morgantown.
- Q39. Metabolism of Polychlorobiphenyls by *Pseudomonas*. (077) J. J. ARENSDORF\* and D. D. FOCHT. Univ. of California, Riverside.
- Q40. Hydroxylation of Chloro- and Hydroxybiphenyls by Methanotrophic Consortia and Axenic Cultures. (079) P. ADRIAENS\* and D. GRBIC-GALIC. Dept. of Civil Engineering, Stanford Univ., Stanford, Calif.
- Q41. In Situ Stimulation of Polychlorinated Biphenyls Biodegradation in Hudson River Sediment. I. Field Study Design and Degradation Results. (081) M. R. HARKNESS, J. B. MCDERMOTT, M. L. STEPHENS, G. L. WARNER, I. J. MONDEI'LO,\* J. J. SALVO, K. W. CARROLL, P. R. WILSON, A. A. BRACCO, D. K. DIETRICH, and W. GATELY. GE Corp. Res. and Development, Schenectady, N.Y.
- Q42. In Situ Stimulation of Polychlorinated Biphenyls Biodegradation in Hudson River Sediment. II. Metabolite Detection and Analysis. (083) W. P. FLANAGAN, R. J. MAY, K. M. FISH, and D. A. ABRAMOWICZ.\* Biol. Sci. Lab., GE Corp. Res. and Development, Schenectady, N.Y.
- Q43. In Situ Stimulation of Polychlorinated Biphenyls Biodegradation in Hudson River Sediment. III. Enumeration and Characterization of Aerobic Bacteria. (085) J. H. LOBOS,\* M. J. BRENNAN, J. T. JACKMAN, and D. T. LIN. GE Corp. Res. and Development, Schenectady, N.Y.
- Q44. Assessing the Presence of Polychlorinated Biphenyl-Degrading Organisms in Tropical Soils. (087) I. E. ROBLEDO\* and G. A. TORANZOS. Dept. of Biol., Univ. of Puerto Rico, Río Piedras, Puerto Rico.
- Q45. Isolation of Biphenyl-Degrading Microorganisms from Puget Sound. (089) S. E. DYKSTERHOUSE,\* R. P. HERWIG, and J. T. STALEY. Dept. of Microbiol., Univ. of Washington, Seattle.
- Q46. Microbial Mineralization of Biphenyl Sorbed to Polyacrylamide. (091) Y. M. CALVILLO\* and M. ALEXANDER. Cornell Univ., Ithaca, N.Y.
- H10. Analysis of the *lux* Regulatory Region from the Squid Light Organ Symbiont *Vibrio fischeri* ES114 (095) K. M. GRAY. Univ. of Iowa, Iowa City.
- H11. Analysis of *pho*1 Fusions Suggests that the *Vibrio fischeri* LuxR Protein Is a Membrane-Associated Luminescence Gene Activator. (097) D. KOLIBACHUK\* and E. P. GREENBERG. Cornell Univ., Ithaca, N.Y., and Univ. of Iowa, Iowa City.
- H12. Putative *Aeromonas* Leucine Zipper Protein Which Regulates *Aeromonas vapA* Gene Expression in *Escherichia coli*. (099) S. CHU\* and T. J. TRUST. Univ. of Victoria, Victoria, British Columbia, Canada.
- H13. 1,2-Propanediol-Dependent Transcription of the *cob* and *pdu* Genes in *Salmonella typhimurium* Is Abolished by Mutations in the *cpe* Locus. (101) M. R. RONDON\* and J. C. ESCALANTE-SEMERENA. Univ. of Wisconsin, Madison.
- H14. Regulation of Transcription of the *Streptococcus gordonii* Glucosyltransferase Gene by *rgg*. (103) M. C. SULAVIK\* and D. B. CLEWELL. Univ. of Michigan, Ann Arbor.
- H15. Regulation of Expression of the Mercury Resistance Operon Encoded by the Plasmid p1258 in *Staphylococcus aureus*. (105) D. MUKHOPADHYAY,\* H. YU, L. CHU, M. HORWITZ, K. S. KIM, and T. K. MISRA. Univ. of Illinois Col. of Med., Chicago.
- H16. Differential Expression of M Protein and C5a Peptidase Genes, Members of the *vir* Regulon, by *Streptococcus pyogenes*. (107) A. PODBIELSKI,\* J. PETERSON, and P. CLEARY. Univ. of Minnesota, Minneapolis.
- H17. Autoregulation of Pyruvate Decarboxylase (*pdh*) in *Zyomonas mobilis*. (109) J. P. MEJIA\* and L. O. INGRAM. Univ. of Florida, Gainesville.
- H18. *flaS*, an Early Gene in the Flagella Regulatory Hierarchy in *Caulobacter crescentus*. (111) W. Y. ZHUANG\* and L. SHAPIRO. Dept. of Developmental Biol., Stanford Univ. Sch. of Med., Beckman Ctr., Stanford, Calif.
- H19. Isolation of *putA* Superrepressor Mutants of *Salmonella typhimurium*: Mutations That Prevent Binding of Inducer. (113) S. W. ALLEN\* and S. R. MALOY. Univ. of Illinois, Urbana.
- H20. Expression and Regulation of the Arsenic Resistance Operon from *Staphylococcus aureus* Plasmid p1258. (115) G. JI\* and S. SILVER. Univ. of Illinois Col. of Med., Chicago.
- H21. Effects of Salicylate, Supercoiling, and *cysB* Mutations on Cd<sup>2+</sup> Sensitivity in *Escherichia coli*. (117) R. GOEL, A. MOTH, R. G. MARTIN, and J. L. ROSNER.\* Nat. Inst. of Diabetes and Digestive and Kidney Diseases, Bethesda, Md.
- H22. Characterization of *ampG* in *Escherichia coli*. (119) K. WESTON-HAFER,\* S. LINDQUIST, and S. NORMARK. Washington Univ. Sch. of Med., St. Louis, Mo.

## Session 28 (H). MUTAGENESIS AND RECOMBINATION

## Session 27 (H). NOVEL REGULATORY PROTEINS

- H9. Mutant Analysis of AmpR, the Regulator for the Inducible Chromosomal  $\beta$ -Lactamase in *Citrobacter freundii*. (093) E. BARTOWSKY,\* C. JACOBS, and S. NORMARK. Dept. of Mol. Microbiol., Washington Univ., St. Louis, Mo.
- H23. Possible Role of DNA Repair in Pseudorevertant Formation in a Temperature-Sensitive Strain of *Salmonella typhi*. ts 51-1. (121) M. J. MALAVASIC,\* B. J. ZELIGS, R. FRIEDLANDER, A. M. HOOKE, and J. A. BELLANTI. Georgetown Univ. Med. Sch., Washington, D.C., and Miami Univ., Oxford, Ohio.
- H24. Characterization of Spontaneous Mutations in Structural Genes for *Acinetobacter calcoaceticus* Protocatechuate 3,4-Dioxygenase. (123) U. GERISCHER\* and L. N. ORNSTON. Dept. of Biol., Yale Univ., New Haven, Conn.
- H25. Characterization of Ionizing Radiation-Sensitive Mutants of *Deinococcus radiodurans*. (125) K. UDUPA, V. RENDE, P. O'CAIN, and J. R. BATTISTA.\* Louisiana State Univ., Baton Rouge.

## Session 29 (T). RNA VIRUSES I

- H26.** Chinese Medicinal Herbs Inhibit Cytochrome P-450-Mediated Mutagenesis, DNA Binding, and Metabolism of Benzo[*a*]pyrene. (127) B. Y. Y. WONG,\* B. H. S. LAU, T. YAMASAKI, and R. W. TEEL. Loma Linda Univ., Loma Linda, Calif.
- H27.** Development of a Highly Efficient Lysogen System for Use in a Genetic Toxicology Assay. (129) K. S. LUNDBERG,\* J. M. SHORT, and P. L. KRETZ. Stratagene, La Jolla, Calif.
- H28.** Manganese(II)-Modified Mutagenesis in *Deinococcus radiodurans*. (131) C. L. LIN, S. T. TAN,\* and M. C. LEE. Inst. of Radiation Biol., Nat. Tsing Hua Univ., and Union Chemical Lab., Industrial Technology Res. Inst., Hsinchu, Taiwan, Republic of China.
- H29.** Proof of Mercury-Induced Mutation to Mercury Hyper-Resistance by a Modified Fluctuation Test. (133) J. CHANG, O. A. OGUNSEITAN,\* J. HONG, and B. H. OLSON. Biochemical Engineering Program and Program in Social Ecology, Univ. of California, Irvine.
- H30.** Introduction of Tn916 into *Clostridium perfringens* Strains by Electroporation of the pAM120 Delivery Vehicle. (135) H. P. BLASCHEK, L. GAINES,\* S. ALLEN, and A. Y. KIM. Univ. of Illinois, Urbana.
- H31.** Nucleotide Sequence of the Site-Specific Integrative Functions from *Lactobacillus gasserii* Bacteriophage  $\phi$ adh. (137) C. FREMAUX,\* G. DE ANTONI, R. RAYA, and T. KLAENHAMMER. Southeast Dairy Foods Res. Ctr., North Carolina State Univ., Raleigh.
- H32.** Isolation of Putative *recA* Gene of *Azotobacter chroococcum*. (139) S. SHANMUGASUNDARAM,\* K. R. NALINA, S. SUGUNA, and M. LAKSHMANAN. Dept. of Microbiol., Sch. of Biol. Sci., Madurai Kamaraj Univ., Madurai, India.
- H33.** Horizontal Gene Transfer by Natural Transformation in Group B Streptococci. (141) G. STEWART,\* S. CLEAVER, and K. GARKO. Dept. of Biol., Univ. of South Florida, and Inst. of Biomolecular Sci., Tampa.
- H34.** Mutations in the *rec-2* Gene of *Haemophilus influenzae* Lead to a Defect in Phage Recombination as Well as Genetic Transformation. (143) D. M. KUPFER\* and D. MCCARTHY. Univ. of Oklahoma, Norman.
- H35.** The *Haemophilus influenzae* Rd *rec-1* Gene. (145) J. J. ZULTY\* and G. J. BARCAK. Univ. of Maryland, Sch. of Med., Baltimore.
- H36.** Recombination between the *hsdL* Genes of *Salmonella typhimurium* LT7 and *hsdL* of Other *Salmonella* Species. (147) L. R. BULLAS\* and O. IVACHTHOOK. Loma Linda Univ., Loma Linda, Calif.
- H37.** Excision of an Amikacin Resistance Gene Cassette as a Nonreplicative Circle from a Multiresistance Operon. (149) A. GRAVEL\* and P. H. ROY. Univ. Laval and Ctr. de Recherche du Ctr. Hosp. Univ. Laval, Ste-Foy, Quebec, Canada.
- H38.** Interaction of the RecA Protein of *Escherichia coli* with Single-Stranded Deoxyoligonucleotides. (151) P. R. BIANCO\* and G. M. WEINSTOCK. Dept. of Biochemistry, Univ. of Texas Med. Sch., Houston.
- H39.** Control of Tandem Duplication Formation in the *Escherichia coli* Chromosome. (153) J. D. HEATH,\* G. ZONG, and G. M. WEINSTOCK. Univ. of Texas Med. Sch., Houston.
- H40.** Cruciform Structure Stimulates Strand Exchange between Chromatin Templates. (155) H. KOTANI\* and E. B. KMIEC. Jefferson Cancer Inst., Thomas Jefferson Univ., Philadelphia, Pa.
- T1.** Detection of Hepatitis C Virus RNA in Experimentally Infected Chimpanzees by Polymerase Chain Reaction. (157) F. MEEKS,\* M. BEACH, L. MIMMS, K. KRAWCZYNSKI, and D. W. BRADLEY. Hepatitis Branch, Nat. Ctr. for Infectious Diseases, CDC, Atlanta, Ga., and Hepatitis R&D, Abbott Lab., Abbott Park, Ill.
- T2.** Hepatopathogenic Potential of R<sub>c</sub> aviruses. (159) M. RIEPENHOFF-TALTY,\* I. UHNOO, H. B. GREENBERG, P. VO, H. F. CLARK, J. E. FISHER, D. RUFFIN, and H. BARRETT. SUNY at Buffalo Sch. of Med. and Children's Hosp., Buffalo, N.Y.; Stanford Univ. Sch. of Med. and VA Med. Ctr., Palo Alto, Calif.; and Univ. of Pennsylvania Sch. of Med. and Children's Hosp., Philadelphia.
- T3.** Correlation of GA1 and Susceptibility to Rotavirus Infection. (161) L. GASCOT and A. J. BEDNARZ-PRASHAD.\* Univ. of Texas Med. Sch., Houston.
- T4.** Coxsackievirus B3 Myocarditis in Mice with Pre-Existing Myocardial Disease: Virus Clearance and Disease Expression. (163) R. KHATIB,\* M. P. REYES, G. KHATIB, and A. GIRALDO. St. John Hosp., Grace Hosp., and Wayne State Univ., Detroit, Mich.
- T5.** Mapping Genetic Determinants of Cardiovirulence in the Coxsackievirus B3 Genome: Comparative Analysis of Genomes of Noncardiovirulent and Cardiovirulent Isolates. (165) N. M. CHAPMAN,\* S. TRACY, Z. TU, and C. GAUNTT. Univ. of Nebraska Med. Ctr., Omaha, and Univ. of Texas Health Sci. Ctr., San Antonio.
- T6.** Antibody-Mediated Enhancement of Respiratory Syncytial Virus Infection Detection by Immune Precipitation. (167) L. R. KRIFOV\* and S. H. HARKNESS. North Shore Univ. Hosp.-Cornell Univ. Med. Col., Manhasset, N.Y.
- T7.** Laboratory Detection of Respiratory Syncytial Virus in Clinical Samples: Experience during Two Consecutive Respiratory Seasons. (169) A. L. PETERSON,\* P. C. GILL, S. R. GENTRY, C. L. DIRKSEN, and A. ERICE. Univ. of Minnesota Health Sci. Ctr., Minneapolis.
- T8.** Effect of Protein Tyrosine Phosphorylation Reduction in K-562 Cells on Measles Virus Production. (171) P. E. WANDA\* and R. L. SEYS. Southern Illinois Univ., Edwardsville.
- T9.** Isolation and Phenotypic Evaluation of ca B/AA/1/66 PAR#1518, a Natural Revertant of an Influenza Virus Vaccine Donor Strain. (173) B. M. MITCHELL\* and D. C. DEBORDE. Univ. of Montana, Missoula.
- T10.** Molecular Characterization of Newcastle Disease Virus Using an Oligonucleotide Probe. (175) J. JARECKI-BLACK\* and S. PALMIERI. USDA, Agricultural Res. Service, Southeast Poultry Res. Lab., Athens, Ga.
- T11.** Cloning of Sendai Viral Proteins for Expression and Transport Studies. (177) H. WU,\* S. CHU, L. AL NASIRI, E. RANNEY, and N. MCQUEEN. California State Univ., Los Angeles.
- T12.** Phenotypes Expressed by Clones of Cold-Adapted Parainfluenza Virus Type 3 Vaccines and Their Parent Seed Viruses. (179) F. NEWMAN,\* L. WELLS, and R. BELSHE. Saint Louis Univ., St. Louis, Mo.
- T13.** Clinical Significance of Parainfluenza 4 in Immunocompromised Individuals. (181) C. B. TOORKEY,\* S. RICE, and D. R. CARRIGAN. Chemicon Int., Inc., Temecula, Calif., and Dept. of Pathology, Med. Col. of Wisconsin, Milwaukee.
- T14.** Some Biological Properties of a Rhabdovirus Isolated from Penaeid Shrimps. (183) Y. LU\* and P. C. LOH. Dept. of Microbiol., Univ. of Hawaii, Honolulu.
- T15.** Infectivity Studies of a Rhabdovirus Isolate from Penaeid Shrimps in *Penaeus stylirostris*. (185) E. NADALA, J. BROCK, Y. LU, and P. LOH.\* Univ. of Hawaii and Anuenue Fisheries Res. Ctr., State of Hawaii, Honolulu.



- T16.** Biological and Antigenic Characterization of Bluetongue Virus Reassortants Recovered from a Bull. (187) M. MAIA,\* M. SMITH, and B. I. OSBURN. Dept. of Pathology, Sch. of Vet. Med., Univ. of California, Davis.
- T17.** Sequence Homology between  $\alpha_2$ -Interferon Receptor and Verotoxin B Subunit. (189) S. C. K. YIU\* and C. A. LINGWOOD. Hosp. for Sick Children and Univ. of Toronto, Toronto, Ontario, Canada.
- T18.** Zidovudine Causes Down-Regulation of Erythropoietin Receptor and Inhibition of Protein Kinase C in Bone Marrow Progenitor Cells. (191) S. R. GOGU,\* J. S. MALTER, and K. C. AGRAWAL. Dept. of Pharmacology and Dept. of Pathology, Tulane Univ. Sch. of Med., New Orleans, La.
- T19.** Togaviruslike Agent Associated with Fulminating Disease of Guinea Fowl. (193) A. BRAHEM, N. DEMARQUEZ, M. BEYRIE, A. VUILLAUME, and H. J. A. FLEURY.\* Lab. Vét. Départemental des Landes, Mont de Marsan, France, and Lab. de Virologie, Univ. de Bordeaux II, Bordeaux, France.
- T20.** Risk of Retroviral Infection among Retrovirology Laboratory and Health Care Workers. (195) R. M. AMIN,\* B. JONES, M. RUBERT, C. STEVENS, L. ZAUMETZER, C. STEVENS, and B. J. POIESZ. VA Med. Ctr. and SUNY Health Sci. Ctr., Syracuse, N.Y.
- T21.** Contribution of Hydrophobic Residues in the Functional Expression of the Human Immunodeficiency Virus *env* Gene Product. (197) W. T. SEAMAN,\* R. B. BELSHE, and T. W. FENGER. Marshall Univ. Sch. of Med., Huntington, W. Va., and St. Louis Univ. Sch. of Med., St. Louis, Mo.
- T22.** Simian Immunodeficiency Virus Infection of Macaque-PBL-SCID Mice. (199) E. HALL,\* J. GREENHOUSE, B. WHITE, S. PAPERMASTER, G. EDDY, D. BURKE, and Y. ROSENBERG. Henry M. Jackson Fndn. and Walter Reed Army Inst. of Res., Rockville, Md.
- T23.** Genetic Diversity within the Envelope V3 Region of Human Immunodeficiency Virus Type 1 Specimens from Cote d'Ivoire. (201) V. BROWN,\* K. POTTS, M. KALISH, C. BANDEA, G. SCHOCHETMAN, K. BRATTEGAARD, E. BOATENG, G. ADJORLOLO, K. DECOCK, and C.-Y. OU. CDC, Atlanta, Ga., and Project Retro, Abidjan, Cote d'Ivoire.
- T24.** Bovine Immunodeficiencylike Virus and Bovine Leukemia Virus Infection of Mississippi Dairy Cattle: a Seroepidemiological Survey. (203) S. THOMAS,\* S. PRUETT, and K. ST. CYR-COATS. Mississippi State Univ., Mississippi State.
- T25.** Delayed Expression of Human Immunodeficiency Virus Type 1 Proteins in CD8<sup>+</sup>-Infected Peripheral Lymphocytes as Compared with Their CD4<sup>+</sup> Counterparts. (205) L. MERCURE,\* D. PHANEUF, and M. A. WAINBERG. Lady Davis Inst. for Med. Res., Montreal, Quebec, Canada.
- T26.** Characterization of Immunoreactive Corticotropin in Lymphocytes Infected with Human Immunodeficiency Virus. (207) F. B. HASHEMI,\* T. K. HUGHES, and E. M. SMITH. Univ. of Texas Med. Branch, Galveston.
- T27.** Measurement of CD4 Binding to Envelope Glycoproteins of Human Immunodeficiency Virus Type 1 and Simian Immunodeficiency Virus. (209) C. J. SCANDELLA,\* I. OBEGI, W. LIDSTER, S. WOLFE, D. BURMAN, S. R. COATES, K. HIGGINS, and J. T. YAMADA. Chiron Corp., Emeryville, Calif.
- T28.** Quantitative Flow Cytometry Reveals a Hierarchy of Hormone Effect on Cell Surface Gp52. (211) E. M. RITZI. Texas Tech Univ. Health Sci. Ctr., Lubbock.
- T29.** Enzyme-Linked Immunosorbent Assay for the Determination of Immunoglobulin G Anti-Respiratory Syncytial Virus Antibody in Serum. (213) R. K. PATEL\* and L. K. WATHEN. Upjohn Co., Kalamazoo, Mich.

## Session 30 (C). BACTERIAL IDENTIFICATION SYSTEMS

- C1.** 2- to 3-h Identifications of Common Clinical Pathogens with the Vitek GNI and GPI Cards. (215) N. S. MOSS,\* C. COOPER, and J. P. GAYRAL. BioMerieux Vitek, Inc., St. Louis, Mo.
- C2.** Comparison of RapID NF, Biolog, and Cellular Fatty Acid Analysis for the Rapid Identification of Nonfermenting Gram-Negative Rods. (217) B. C. SCHIEVEN,\* E. HENRY, L. STOAKES, and Z. HUSSAIN. Victoria Hosp., London, Ontario, Canada.
- C3.** Comparison of the Biolog and MIDI Systems for Identification of Gram-Negative Nonfermenters. (219) J. GUTSCHENRITTER,\* P. SCHAMS, C. O'HARA, and D. H. PERSING. Mayo Clin./Fndn., Rochester, Minn., and CDC, Atlanta, Ga.
- C4.** Evaluation of Four Commercial Identification Methods Designed for Nonfermentative Gram-Negative Rods. (221) R. GOPAUL, S. FINN, P. HOSTETLER, B. DIENA,\* and A. NEWMAN. St. Joseph's Health Ctr., London, Ontario, Canada, and Daniel Med. Lab., Downsview, Ontario, Canada.
- C5.** Enzymatic Test System for the Rapid Identification of *Enterobacteriaceae* and Selected Oxidase-Negative, Gram-Negative Rods. (223) L. A. ERIQUFZ,\* A. P. JONES, and N. E. HODINKA. IDS, Atlanta, Ga.
- C6.** Parallel Comparison of Accuracy of API 20E, MicroSCAN Walk/Away Rapid ID, and Roche Cobas Micro ID-E/NF for the Identification of *Enterobacteriaceae*. (225) C. M. O'HARA\* and J. M. MILLER. CDC, Atlanta, Ga.
- C7.** Comparison of an Automated System (autoSceptor) with the Manual Sceptor System for Reading Newly Revised Gram-Negative Identification Panels. (227) C. PATTERSON,\* C. KENNEDY, R. WOOLVEN, R. SCHWALBE, B. BRADLEY, T. AVARI, C. CHAMBERS, and J. HEJNA. Drs. T.A. Kasper & Assoc., Edmonton, Alberta, Canada; Belleville Gen. Hospital, Belleville, Ontario, Canada; Univ. of Maryland Med. System, Baltimore; and Becton Dickinson Diagnostic Instrument Systems, Sparks, Md.
- C8.** Adaptation of a Commercially Available Database Program (Paradox) To Assist in the Identification of the *Enterobacteriaceae*. (229) L. SAMONS. San Diego County Publ. Health Lab., San Diego, Calif.
- C9.** API LISTERIA, a New Identification System for *Listeria*. (231) I. CANIAUX, M. DOUCET,\* D. MONGET, and M. BABOLAT. BioMerieux S.A., La Balme les Grottes, France.
- C10.** Evaluation of the New API *Listeria* Identification System. (233) E. BANNERMAN,\* B. CATIMEL, M. N. YERSIN, J. BILLE, and J. ROCOURT. Univ. Hosp., Lausanne, Switzerland, and Inst. Pasteur, Paris, France.
- C11.** Identification of *Listeria* spp. using the API Coryne System. (235) K. KERR,\* P. M. HAWKEY, and R. W. LACEY. Dept. of Microbiol., Leeds Univ., Leeds, U.K.
- C12.** New System for Rapid Identification of *Corynebacterium* Species and Other Coryneforms. (237) S. E. GAVIN,\* R. B. LEONARD, A. M. BRIELEDEN, and M. B. COYLE. Harborview Med. Ctr. and Univ. of Washington, Seattle.
- C13.** Multicenter Comparison of MicroScan Rapid Gram-Positive Combo Panel 1 with Conventional Methods for Identification of *Streptococcus* spp. and *Enterococcus* spp. (239) D. F. SAHM,\* B. RAY, S. BRUNETT, A. E. CRIST, JR., L. M. JOHNSON, J. BRAIDT, and M. J. FERRARO. Univ. of Chicago, Chicago, Ill.; Baptist Med. Ctr., Oklahoma City, Okla.; Polyclinic Med. Ctr., Harrisburg, Pa.; and Massachusetts Gen. Hosp., Boston.
- C14.** Comparative Study of Four Commercial PYR Test Systems. (241) A. MESZAROS,\* L. STRENKOSKI, and R. FIRSTENBERG-EDEN. Difco Laboratories, Res. & Development, Ann Arbor, Mich.

- C15.** Effects of Medium and Incubation Temperature on the Motility of *Enterococcus gallinarum*. (243) Y. B. KORICA,\* E. DRISCOLL, R. L. FACKLAM, and A. W. PASCULLE. Univ. of Pittsburgh Med. Ctr., Pittsburgh, Pa., and CDC, Atlanta, Ga.
- C16.** Comparison of Three *Streptococcus* Identification Systems for Identification of Clinical *Enterococcus* Isolates. (245) J. A. BRANDT\* and J. E. LEWIS. Loma Linda Univ. Med. Ctr., Loma Linda, Calif.
- C17.** Identification of *Streptococcus mutans* from Human Dental Plaque by Using the RapID STR System. (247) C. OLETTA\* and H. ZLOTNIK. Sch. of Med., Univ. of Puerto Rico, San Juan, Puerto Rico.
- C18.** Reevaluation of the Optochin Disk Susceptibility Test for Identification of *Streptococcus pneumoniae*. (249) J. H. JORGENSEN, L. A. MAHER,\* A. W. HOWELL, and M. L. MCELMEEL. Univ. of Texas Health Sci. Ctr., San Antonio.
- C19.** Characterization of Resistance to Optochin among Isolates of *Streptococcus pneumoniae*. (251) D. A. WATSON\* and D. M. MUSER. VA Med. Ctr. and Baylor Col. of Med., Houston, Tex.
- C20.** API NH, a New Identification System for *Neisseria*, *Haemophilus*, and *Moraxella catarrhalis*. (253) D. MONGET,\* M. DOUCET, I. CANIAUX, and M. BABOLAT. BioMérieux, S.A., La Balme les Grottes, France.
- C21.** Evaluation of RAPIDEC-STAPH for Identification of Significant Staphylococcal Isolates. (255) K. RISTOW,\* D. NOVAK, and W. M. JANDA. Univ. of Illinois Hosp., Chicago.
- C22.** Numerical Approach for the Reference Identification of *Staphylococcus*, *Stomatococcus*, and *Micrococcus*. (257) D. L. RHODEN,\* G. A. HANCOCK, and J. M. MILLER. CDC, Atlanta, Ga.
- C23.** Identification of Human Pathogenic Coagulase-Negative *Staphylococcus* Species by Biolog and Staph-Ident. (259) J. C. MCLAUGHLIN,\* V. H. QUENZER, T. L. MERLIN, W. C. THOMPSON, and J. FIERRO. Univ. of New Mexico Sch. of Med. and New Mexico Federal Regional Med. Ctr., Albuquerque.
- C24.** Comparison of the Identification of Gram-Positive Aerobic Bacteria by Biolog and Vitek. (261) J. C. MCLAUGHLIN,\* K. L. RUOFF, V. H. QUENZER, T. L. MERLIN, W. C. THOMPSON, and J. FIERRO. Univ. of New Mexico Sch. of Med. and New Mexico Reg. Fed. Med. Ctr., Albuquerque, and Massachusetts Gen. Hosp., Boston.
- C25.** Multicenter Comparison of MicroScan Rapid Gram-Positive Combo Panel 1 and Positive Combo Panel 5 with Conventional Methods for Identification of *Staphylococcus* spp. (263) A. E. CRIST, JR.,\* L. M. JOHNSON, B. RAY, D. F. SAHM, C. CIAGLIA, W. E. KLOOS, D. ENGMAN, and D. N. BALLARD. Polyclinic Med. Ctr., Harrisburg, Pa.; Baptist Med. Ctr., Oklahoma City, Okla.; Univ. of Chicago, Chicago, Ill.; and North Carolina State Univ., Raleigh.
- C26.** *Enterococcus casseliflavus*, an Agent of Nosocomial Bloodstream Infections. (265) W. NAUSCHUETZ, R. LONGFIELD,\* S. TREVINO, L. HARRISON, L. FLETCHER, and W. WORTHAM. Brooke Army Med. Ctr., Fort Sam Houston, Tex.
- A2.** Gene-Encoded Gentamicin Resistance in *Citrobacter freundii* and *Proteus vulgaris*. (269) M. A. BRASSETT\* and E. C. ACHBERGER. Louisiana State Univ., Baton Rouge.
- A3.** Interaction of A-Band and B-Band Lipopolysaccharide of *Pseudomonas aeruginosa* with Gentamicin and Its Possible Lethal Effect. (271) J. KADURUGAMUWA,\* T. MOK, J. LAM, G. SOUTHAM, and T. J. BEVERIDGE. Dept. of Microbiol., Univ. of Guelph, Guelph, Ontario, Canada.
- A4.** Species Distribution, Cloning, and Expression of the Chromosomal aac(6')-Ic Gene from *Serratia marcescens*. (273) A. M. SNELLING, P. M. HAWKEY,\* J. HERITAGE, P. M. BENNETT, P. DOWNEY, and B. HOLMES. Dept. of Microbiol., Univ. of Leeds, Leeds, U.K.; Dept. of Microbiol., Univ. of Bristol, Bristol, U.K.; and Nat. Collection of Type Cultures, London, U.K.
- A5.** Comparison of Methods for Detecting High-Level Gentamicin Resistance in Enterococci. (275) L. STEELE-MOORE,\* D. BERG, A. LOOKABAUGH, B. REICHWEIN, and W. J. HOLLOWAY. Med. Ctr. of Delaware, Wilmington.
- A6.** Treatment of Experimental Endocarditis Caused by  $\beta$ -Lactamase-Producing, Aminoglycoside-Resistant *Enterococcus faecalis*. (277) S. LAVOIE,\* S. MARKOWITZ, D. WILLIAMS, G. STUART, and E. WONG. Veterans Affairs Med. Ctr., Richmond, Va.
- A7.** Effect of Continued Amikacin Use as Primary Aminoglycoside in Emergence of Multiresistant Aerobic Gram-Negative Bacilli. (279) W. URSCHELL, S. SAAVEDRA,\* C. RAMIREZ RAMIREZ, and C. H. RAMIREZ RONDA. Infectious Disease Program, Univ. of Puerto Rico Sch. of Med. and VA Med. Ctr., San Juan, Puerto Rico.
- A8.** Expression of Increased Amikacin Resistance through Random Mutagenesis of the Aminoglycoside 3'-Phosphotransferase II (APH 3'-II) Gene. (281) C. MULLINS. Univ. of Louisville, Louisville, Ky.
- A9.** Site-Specific Mutations of Highly Conserved Residues in Aminoglycoside 3'-Phosphotransferase II [APH(3')-II]: Phenotypic and Structural Analysis of Mutant Enzymes. (283) S. KOCABIYIK\* and M. PERLIN. Univ. of Louisville, Louisville, Ky.
- A10.** Kinetic Comparison of a Purified Aminoglycoside 3'-Phosphotransferase Type II with a New Mutant Enzyme. (285) J. SIREGAR, S. A. LERNER, and S. MOBASHERY.\* Wayne State Univ., Detroit, Mich.
- A11.** Effect of Pathological Changes of pH, pO<sub>2</sub>, and pCO<sub>2</sub> on Antibiotic Activity. (287) C. KONIG,\* H. P. SIMMEN, and J. BLASER. Univ. Hospital Zurich, Zurich, Switzerland.
- A12.** Significant Reduction of Amikacin Therapeutic Dose with Sodium Salicylate in *Klebsiella* Lobar Pneumonia in Rats. (289) P. DOMENICO,\* D. C. STRAUS, and B. A. CUNHA. Winthrop-Univ. Hosp., Mineola, N.Y., and Texas Tech Univ., Lubbock.
- A13.** Macrolide Transport in Normal and Porin Mutants of *Escherichia coli*. (291) J. O. CAPOBIANCO\* and R. C. GOLDMAN. Abbott Lab., Abbott Park, Ill.
- A14.** Intracellular Accumulation of Dirithromycin (LY 237216) in Mouse Macrophages. (293) D. CROTEAU, J. BLAIS,\* and S. CHAMBERLAND. Ctr. de Recherche du Ctr. Hosp. de l'Univ. Laval, Quebec, Quebec, Canada.
- A15.** In Vitro Activity of Azithromycin against Anaerobes Using the Microdilution Technique with Oxyrase Supplemented Broth. (295) S. NACHNANI,\* E. MOLITORIS, and H. WEXLER. UCLA Sch. of Med. and VA Wadsworth Med. Ctr., Los Angeles, Calif.
- A16.** Use of Two-Dimensional Gels To Analyze the Postantibiotic Effect of Quinolones on *Escherichia coli*. (297) L. GUAN\* and J. C. BURNHAM. Med. Col. of Ohio, Toledo.
- A17.** Non-Porin-Dependent Bactericidal Activity of Sanguinarine against *Escherichia coli*. (299) J. M. SHERMAN,\* K. C.

### Session 31 (A). MECHANISM OF ACTION AND RESISTANCE

- A1.** Induction of the Heat Shock Response Enhances Aminoglycoside Killing in *Escherichia coli*. (267) H. FRAIMOW\* and E. VENUTI. Jefferson Med. Col., Philadelphia, Pa.

GODOWSKI, E. D. WOLFF, and R. L. DUNN. Atrix Lab., Inc., Fort Collins, Colo.

## Session 32 (A). ANTIBIOTIC RESISTANCE

- A18.** Characterization and Interspecific Relationships of Antibiotic Resistance Plasmids from *Staphylococcus haemolyticus*. (301) S. SCHWARZ\* and H. BLOBEL. Inst. of Bacteriol. and Immunology, Justus-Liebig-Univ., Giessen, Germany.
- A19.** Class D Tetracycline Resistance Determinant: Analysis of the Nucleotide and Deduced Protein Sequence. (303) M. F. VARELA and J. K. GRIFFITH.\* Univ. of New Mexico, Sch. of Med., Albuquerque.
- A20.** Molecular Characterization and Phylogeny of a New Plasmid-Encoded Tetracycline Resistance Determinant from *Staphylococcus hyicus*. (305) S. SCHWARZ and H. BLOBEL.\* Inst. of Bacteriol. and Immunology, Justus-Liebig-Univ., Giessen, Germany.
- A21.** Substrate Specificities of Tetracycline Efflux Pumps. (307) G. G. GUAY\* and D. M. ROTHSTEIN. Lederle Lab., Pearl River, N.Y.
- A22.** Effect of *tet* Gene Expression on ATP/ADP Ratios in *Escherichia coli*. (309) A. A. MONDRAGON,\* R. J. RADLOFF, and J. K. GRIFFITH. Univ. of New Mexico, Sch. of Med., Albuquerque.
- A23.** Transfer of Tetracycline Resistance Determinants in Staphylococci by Phage-Mediated Conjugation and Conjugation. (311) A. TSELENIS-KOTSOWILIS, M. ZOUBERIS-KOLIOMICHALIS, and J. PAPAVALASSILOU.\* Dept. of Microbiol., Univ. of Athens, Athens, Greece.
- A24.** Daptomycin Resistance in *Staphylococcus aureus*. (313) T. S. LUNDSTROM, G. W. KAATZ,\* and S. M. SEO. Wayne State Univ., Detroit, Mich.
- A25.** Conservation of *mar* Sequences among Members of the *Enterobacteriaceae*. (315) S. P. COHEN,\* W. YAN, and S. B. LEVY. Tufts Univ. Sch. of Med., Boston, Mass., and Gene-Trak Systems, Framingham, Mass.
- A26.** Three Putative Proteins in the *mar* Operon Mediate Intrinsic Multidrug Resistance in *Escherichia coli*. (317) W. YAN,\* S. P. COHEN, and S. B. LEVY. Tufts Univ. Sch. of Med., Boston, Mass.
- A27.** Molecular Cloning and Characterization of a Gene Conferring High-Copy-Number-Dependent Multidrug Resistance in *Escherichia coli*. (319) P. MILLER,\* L. GAMBINO, and S. GRACHECK. Parke-Davis Pharmaceutical Res. Div., Warner-Lambert Co., Ann Arbor, Mich.
- A28.** Evidence for a "Nonconjugal" Chromosome-Borne, High-Level Gentamicin Resistance Transposon in *Enterococcus faecalis*. (321) L. A. THAL,\* J. CHOW, J. E. PATTERSON, D. B. CLEWELL, and M. J. ZERVOS. William Beaumont Hosp., Royal Oak, Mich.; Yale Univ. Sch. of Med., New Haven, Conn.; Univ. of Michigan, Ann Arbor; and Wayne State Univ., Detroit, Mich.
- A29.** Detection of High-Level Aminoglycoside and  $\beta$ -Lactam Resistance among Enterococcal Isolates. (323) R. HORN,\* J. LAVALLEE, and H. G. ROBSON. Royal Victoria Hosp., McGill Univ., Montreal, Quebec, Canada.
- A30.** Susceptibility of Pneumococcal Cell Walls to the Lytic Complex-Lysoamidase Depends on Resistance to Penicillin. (325) A. SEVERIN. Rockefeller Univ., New York, N.Y., and Inst. of Biochemistry and Physiology of Microorganisms, USSR Academy of Sci., Pushchino, USSR.
- A31.** First Molecular Characterization of a Plasmid-Mediated Tn1331 in the Genus *Salmonella*. (327) D. CENTRON GARCIA,\* M. WOJLOJ, S. KAUFMAN, and S. PINEIRO. Univ. of Bs.As., Hosp. de Niños R. Gutierrez, Hosp. Fernández, and Nat. Council Res., BioSidus Lab., Buenos Aires, Argentina.

- A32.** Chloramphenicol Resistance in *Salmonella typhi* from Bombay. (329) A. MEHTA,\* C. RODRIGUES, P. H. BLACKEMORE, C. KALLAT, V. R. JOSHI, S. MEHTAR, and A. HAKIMIYAN. Microbiol. Sect., Dept. of Lab. Med., P. D. Hinduja Nat. Hosp. and Med. Res. Ctr., Bombay, India, and North Middlesex Hosp., London, U.K.
- A33.** Impaired Porin Accessibility to Bacteriophages in *Escherichia coli* ATCC 25922. (331) M. RIVERA,\* A. BERTASSO, and N. H. GEORGOPAPADAKOU. Roche Res. Ctr., Nutley, N.J.

## POSTER SESSIONS

Wednesday, 10:30-Noon, Exhibit Hall C

(Board numbers in parentheses)

## Session 33 (Q). MICROBIAL INTERACTIONS WITH SULFUR COMPOUNDS

- Q47.** Phototrophic Growth on Mercaptomalate, an Organolithotrophic Substrate. (002) P. T. VISSCHER\* and B. F. TAYLOR. Univ. of Miami, Miami, Fla.
- Q48.** Isolation and Characterization of the Parathion Hydrolase Gene from Bacterial Strain B-1. (004) W. W. MULBRY\* and V. VOGEL. Pesticide Degradation Lab., USDA, Agricultural Res. Service, Beltsville, Md., and Howard Hughes Med. Inst., Johns Hopkins Univ., Baltimore, Md.
- Q49.** Effect of Soil Moisture on the Degradation of Metsulfuron. (006) I. E. CORREA\* and W. C. STEEN. U.S. EPA, Athens, Ga.
- Q50.** Characterization of Linear Alkylbenzene Sulfonate-Mineralizing Consortia. (008) A. BREEN,\* L. JIMENEZ, and T. W. FEDERLE. Ctr. for Environmental Biotechnology, Univ. of Tennessee, Knoxville, and Procter and Gamble Co., Cincinnati, Ohio.
- Q51.** Microbial Hydrogenation of Coal and Model Compounds by *Desulfovibrio desulfuricans* and *Sulfolobus brierleyi*. (010) M. V. S. MURTY,\* D. BHATTACHARYYA, and M. I. H. ALEEM. Sch. of Biol. Sci. and Dept. of Chemical Engineering, Univ. of Kentucky, Lexington.
- Q52.** Analyses of Monohydroxyl Biphenyl Production from Dibenzothiophene by New Desulfurizing Bacteria. (012) P. WANG\* and S. KRAWIEC. Lehigh Univ., Bethlehem, Pa.
- Q53.** Aerobic Microbial Cometabolism of Methylidibenzothio-phenes by Bacterial Cultures. (014) P. M. FEDORAK,\* S. SAFTIC, and J. T. ANDERSSON. Univ. of Alberta, Edmonton, Alberta, Canada, and Univ. of Münster, Münster, Germany.
- Q54.** Microbiological Modeling of Acid Mine Drainage Production in Pyritic Waste Rock Pile. (016) R. GUAY,\* S. DUFRESNE, E.-R. DESJARDINS, and P. GELINAS. Dept. of Microbiol. and Dept. of Geology (GREGI), Laval Univ., Ste-Foy, Quebec, Canada.
- Q55.** Microbial Control of Hydrogen Sulfide Production. (018) V. K. BHUPATHIRAJU,\* M. J. MCINERNEY, and K. L. SUBLETTE. Univ. of Oklahoma, Norman, and Univ. of Tulsa, Tulsa, Okla.
- Q56.** Use of Sulfate-Reducing Bacteria for the Removal of Sulfur Dioxide from Combustion Gases. (020) M. R. WIEBE,\* J. M. BARNES, and W. A. APEL. Idaho Nat. Engineering Lab., EG&G Idaho, Inc., Idaho Falls.
- Q57.** Production of Blackening and Odor in Kaolin Clay by Sulfate-Reducing Bacteria. (022) H. HUANG and H. W. REED, SR.\* Emory Univ., Atlanta, Ga., and Georgia Col. Milledgeville.

- Q58.** Organic Sulfur Cycling in Marine Microbial Mats. (024) H. VAN GEMERDEN and P. T. VISSCHER.\* Univ. Groningen, Groningen, The Netherlands, and Univ. of Miami, Miami, Fla.
- Q59.** Microbial Ecology of the Sulfur Bacteria *Thiothrix* sp. in Florida Waters. (026) R. L. BRIGMON,\* G. BITTON, and S. G. ZAM. Univ. of Florida, Gainesville.

**Session 34 (N). MICROBIAL ECOLOGY:  
SOIL AND WATER**

- N1.** Characterization of Soil Bacteria Naturally Resistant to a Herbicide Which Inhibits Valine-Isoleucine Biosynthesis. (028) A. L. MARKS,\* A. E. BROWN, and C. T. HIGHFILL. Auburn Univ., Auburn, Ala.
- N2.** Occurrence and Characterization of Copper-Tolerant Variants of *Vibrio alginolyticus* and *Vibrio parahaemolyticus*. (030) V. J. HARWOOD,\* C. A. KEELAN, L. D. HOWELL, and A. S. GORDON. Dept. of Biol., Old Dominion Univ., Norfolk, Va.
- N3.** Responses of Diverse Heterotrophic Bacteria to Elevated Copper Concentrations. (032) L. D. HOWELL, S. SAYYAR, V. HARWOOD, and A. S. GORDON.\* Old Dominion Univ., Norfolk, Va.
- N4.** Survey of Many Heavy Metals Affecting Growth of *Anacystis nidulans*. (034) L. LEE. Biol. Dept., Montclair State Col., Upper Montclair, N.J.
- N5.** Isolation and Characterization of Methanotrophic Bacteria from a Great Lakes Estuary. (036) M. L. P. COLLINS,\* L. A. BUCHHOLZ, C. A. BRANTNER, D. B. DRECKTRAH, and C. C. REMSEN. Univ. of Wisconsin, Milwaukee.
- N6.** Polymerase Chain Reaction Detection of Biodegradation Genes from Environmental Samples: Approach to the Study of Bacterial Populations in Their Native Habitats. (038) J. B. HERRICK,\* E. L. MADSEN, and W. C. GHIORSE. Cornell Univ., Ithaca, N.Y.
- N7.** Molecular Characterization of Soil Bacterial Populations Using 16S rDNA Sequence Analysis. (040) C. YOUNG,\* R. BURGHOFF, L. KEIM, J. LUTE, and S. HINTON. Exxon Res. and Engineering Co., East Annandale, N.J.
- N8.** Effects of a Lignin-Degrading Recombinant *Streptomyces* Species on Microbial Populations and Processes in Two Diverse Soils. (042) J. D. DOYLE\* and C. W. HENDRICKS. ManTech Environmental Technology, Inc., U.S. EPA, Corvallis, Oreg.
- N9.** Comparison of *Cellulomonas* sp. Population Dynamics and Leaf Litter Decomposition in Mesocosm Streams and White Clay Creek. (044) T. L. BOTT\* and L. A. KAPLAN. Stroud Water Res. Ctr., Academy of Natural Sci., Avondale, Pa.
- N10.** Nutrient Limitation of Bacterial Growth in Alkaline Wetland Discharge Zones. (046) T. C. GSELL,\* C. S. TANSKY, and R. M. VENTULLO. Univ. of Dayton, Dayton, Ohio.
- N11.** Ecological Network Analysis of N Cycling within a Spanish Rice Field. (048) R. R. CHRISTIAN\* and E. FORES. East Carolina Univ., Greenville, N.C., and Univ. of Barcelona, Barcelona, Spain.
- N12.** Removal of Ammonia from an Aquarium System by Immobilized *Nitrosomonas europaea*. (050) T. M. BURKHART\* and R. M. PFISTER. Ohio State Univ., Columbus.
- N13.** Chemotaxis of *Azospirillum* Species toward Aromatic Compounds. (052) G. LOPEZ-DE-VICTORIA\* and C. R. LOVELL. Univ. of South Carolina, Columbia.
- N14.** Growth Rates of Aquatic Bacteria Determined from Empirical and Theoretical Thymidine Conversion Factors. (054) T. H. CHRZANOWSKI\* and S. B. WILLIAMS. Univ. of Texas, Arlington.

- N15.** Attempts To Develop Culture Media for Large Sulfide-Oxidizing Bacteria, *Beggiatoa*, *Thiothrix*, and *Achromatum*. (056) J. G. CORBETT\* and J. M. LARKIN. Dept. of Microbiol., Louisiana State Univ., Baton Rouge.
- N16.** Further Study of Isopropyl Cindoline Applied to the Direct Viable Count. (058) N. A. SERVIS,\* R. A. LEAKE, M. S. LYTLE, and J. C. ADAMS. Univ. of Wyoming and Laramie Water Dept., Laramie.
- N17.** Long-Term Monitoring of *Legionella pneumophila* in Southeastern Cooling Towers. (060) C. B. FLIERMANS\* and R. L. TYNDALL. Savannah River Lab., Aiken, S.C., and Oak Ridge Nat. Lab., Oak Ridge, Tenn.

**Session 35 (H). SIGMA FACTORS AND PROMOTERS**

- H41.** Isolation of Sigma Factor Genes from the Symbiont *Rhizobium meliloti*. (062) B. G. RUSHING,\* R. F. FISHER, and S. R. LONG. Stanford Univ., Stanford, Calif.
- H42.** Structure and Function Analysis of *Bacillus subtilis* Sigma Factors. (064) J. D. HELMANN,\* Y. F. CHEN, Y. L. JUANG, L. CHEN, and S. WILLIAMS. Cornell Univ., Ithaca, N.Y.
- H43.** Study of Promoter Recognition by RNA Polymerase from the Purple Nonsulfur Bacterium *Rhodobacter sphaeroides*. (066) R. KARLS,\* A. MITIN, and T. DONOHUE. Univ. of Wisconsin, Madison.
- H44.** *rpoD* Homologous Genes of *Microcystis* (*Synechocystis*) Strains. (068) M. SHIRAI,\* M. ASAYAMA, T. SAKAMOTO, A. SUZUKI, O. IJIMA, A. SATO, T. AIDA, and M. NAKANO. Ibaraki Univ., Ami, Ibaraki, Japan, and Jichi Med. Sch., Yakushiji, Tochigi, Japan.
- H45.** Organization and Expression of *flbF*: a Developmentally Regulated *Caulobacter crescentus* Flagellar Gene That Is Required for Expression of Flagellar Genes with  $\sigma^{54}$  promoters. (070) L. A. SANDERS,\* C. STOKOE, L. BENNETT, and D. A. MULLIN. Tulane Univ., New Orleans, La.
- H46.** Characterization of Biosynthetic Gene Promoters in *Caulobacter crescentus*. (072) J. MALAKOOTI,\* S. P. WANG, and B. ELY. Univ. of South Carolina, Columbia.
- H47.** Regulation of a Negative Regulator: Studies of the *flgM* Gene in *Salmonella typhimurium*. (074) K. GILLEN\* and K. HUGHES. Univ. of Washington, Seattle.
- H48.** Genetic Regulation of Shiga Toxin Production. (076) N. F. HABIB\* and M. P. JACKSON. Wayne State Univ. Sch. of Med., Detroit, Mich.
- H49.** Sequence Analysis of Carotenoid Biosynthesis Operon in *Erwinia herbicola*. (078) K.-Y. TO,\* C.-L. CHEN, C.-H. HUNG, E.-M. LAI, T.-P. LIN, L.-Y. LEE, and S.-T. LIU. Chang-Gung Med. Col., Taoyuan, Taiwan, Republic of China.
- H50.** Iron-Mediated Transcriptional Regulation of Enterobactin Transport Genes in *Escherichia coli*. (080) C. CHRISTOFFERSEN,\* T. BRICKMAN, and M. MCINTOSH. Univ. of Missouri, Columbia.
- H51.** Mutational Analysis of the Promoter-Regulatory Region for the *fdnGHI* (Formate Dehydrogenase-N) Operon in *Escherichia coli* K-12. (082) J. LI\* and V. STEWART. Cornell Univ., Ithaca, N.Y.
- H52.** Comparative Analysis of the Seven RNA Promoters of *Escherichia coli*. (084) C. CONDON,\* C. SQUIRES, and C. SQUIRES. Columbia Univ., New York, N.Y.
- H53.** Transcriptional Studies with Promoters Containing Curved DNA Using RNA Polymerase from *Escherichia coli* and *Bacillus subtilis*. (086) D. J. STEMKE, C. A. NICKERSON,\* and E. C. ACHBERGER. Louisiana State Univ., Baton Rouge.

- H54.** Nucleotide and Deduced Amino Acid Sequence of the pH-Induced Arginine Decarboxylase (*adi*) of *Escherichia coli*: Analysis of Its Promoter Region and Sequence Comparison to Four Decarboxylases. (088) K. P. STIM\* and G. N. BENNETT. Rice Univ., Houston, Tex.
- H55.** Construction of a  $\lambda$  Phage Vector System for Assessing Local Supercoiling of Chromosomal Domains in *Escherichia coli*. (090) T. KOGOMA,\* G. E. KELLAM, and G. W. CADWELL. Univ. of New Mexico Med. Sch., Albuquerque.
- H56.** Molecular Analysis of *cis*-Acting, Orientation-Dependent Positive Control System of Pheromone-Inducible Conjugation Functions in *Enterococcus faecalis*. (092) J. CHUNG\* and G. DUNNY. Univ. of Minnesota, St. Paul.
- H57.** Construction of Promoter-Chloramphenicol Acetyltransferase Fusions To Examine Transcriptional Regulation of the Fructosyltransferase Gene of *Streptococcus mutans*. (094) D. L. KISKA\* and F. L. MACRINA. Virginia Commonwealth Univ., Richmond.
- H58.** Promoter Localization and Initial Characterization of Expression of the Staphylococcal Enterotoxin A Gene of *Staphylococcus aureus*. (096) D. W. BORST\* and M. J. BETLEY. Univ. of Wisconsin, Madison.
- H59.** Analysis of Promoter Sequences of *Staphylococcus aureus* Bacteriophages. (098) S. PINEIRO\* and G. D. CENTRON. CONICET (Nat. Technical Sci. Res. Council), Univ. of Buenos Aires Sch. of Med.-Lab. BioSidus, Buenos Aires, Argentina.

### Session 36 (H). PLASMIDS: REPLICATION AND CONJUGATION

- H60.** Characterization of the Replication Region of the pMJ101 Plasmid from *Vibrio ordalii*. (100) L. A. ACTIS,\* C. BIDINOST, and J. H. CROSA. Oregon Health Sci. Univ., Portland, and Facultad de Ciencias Quimicas, Univ. Nacional de Cordoba, Cordoba, Argentina.
- H61.** Characterization of the Plasmid ColV-K30 Maintenance Determinants. (102) L. M. CROSA,\* A. E. GAMMIE, and J. H. CROSA. Oregon Health Sci. Univ., Portland.
- H62.** Protein Analysis of the Replication Function(s) of pNG2 in *Escherichia coli*. (104) M. E. HART\* and J. J. IANDOLO. Kansas State Univ., Manhattan.
- H63.** Cloning of the Replication Region of the Bacteriocinogenic Plasmid pRJ9 from *Staphylococcus aureus*. (106) S. S. OLIVEIRA, S. A. ARAUJO, and M. C. F. BASTOS.\* Univ. Federal do Rio de Janeiro, Rio de Janeiro, Brazil.
- H64.** Plasmid Replication in *Bacillus sphaericus* 2315. (108) R. PUJASTUTI\* and T. ALTON. Western Illinois Univ., Macomb.
- H65.** Sequence and Deletion Analysis of an Origin of Replication from the IncH11 Plasmid R27. (110) P. NEWNHAM\* and D. E. TAYLOR. Univ. of Alberta, Edmonton, Alberta, Canada.
- H66.** Cloning of an *Escherichia coli* Gene Controlling the DNA Restriction Function upon Conjugal Transfer. (112) A. PRAKASH\* and J. RYU. Dept. of Microbiol., Loma Linda Univ., Loma Linda, Calif.
- H67.** The Amino Terminus of the Pilin Polypeptide Subunit in Pilus Filaments Produced by an F *traX* Mutant Is Not Acetylated. (114) K. MANEAWANNAKUL,\* D. MOORE, and K. IPPEN-IHLER. Texas A&M Univ. Health Sci. Ctr., College Station.
- H68.** Sequence Analysis and Transfer and Phage-Related Properties of IncP Plasmid Gene Products TraF and TraG. (116) V. L. WATERS,\* B. STACK, W. PANSEGRAU, E. LANKA, and P. G. GUINEY. Univ. of California Med. Ctr.,

San Diego, and Max Planck Inst. for Molecular Genetics, Berlin, Germany.

- H69.** Positive Regulation of Conjugal Transfer of T1 Plasmid pTiC58 in *Agrobacterium tumefaciens*. (118) K. R. PIPER,\* S. BECK VON BODMAN, and S. K. FARRAND. Univ. of Illinois, Urbana.
- H70.** Nucleotide Sequence of the *traB* and *oriT* Region of *Enterococcus faecalis* Plasmid pAD1. (120) F. Y. AN\* and D. B. CLEWELL. Univ. of Michigan, Ann Arbor.
- H71.** Cloning of *Enterococcus faecalis* Plasmid pCF10-Encoded Genes Required for Expression of the Receptor for the Sex Pheromone cCF10. (122) D. MANIAS,\* R. RUHFEL, J. LEEDS, and G. DUNNY. Univ. of Minnesota, St. Paul.
- H72.** Cloning of Genes Responsible for Production of Binding Substance, the Recipient-Encoded Receptor Mediating the Formation of Mating Aggregates in *Enterococcus faecalis*. (124) B. A. BENSING\* and G. M. DUNNY. Univ. of Minnesota, St. Paul.
- H73.** Use of *TnphoA* Mutagenesis in *Escherichia coli* To Identify *Staphylococcus aureus* Conjugative Transfer Genes Encoding Extramembrane Proteins. (126) T. M. MORTON\* and G. L. ARCHER. Virginia Commonwealth Univ., Richmond.

### Session 37 (H). MOLECULAR TAXONOMY AND EVOLUTION

- H74.** Repetitive Sequence Distribution in Eubacteria and Applications of Repetitive Polymerase Chain Reaction to Genomic Analysis. (128) J. VERSALOVIC,\* T. KOEUTH, and J. R. LUPSKI. Baylor Col. of Med., Houston, Tex.
- H75.** Molecular Evolution of Mn- and Fe-Superoxide Dismutases in Bacteria. (130) K. NAKAYAMA\* and A. SASAKI. Dept. of Microbiol., Faculty of Dent., and Dept. of Biol., Faculty of Sci., Kyushu Univ., Fukuoka, Japan.
- H76.** Macromolecular Synthesis (*mms*) Operon DNA Sequence Conservation and Evolution in Eubacteria. (132) J. VERSALOVIC, T. KOEUTH, K. GESZVAIN, and J. R. LUPSKI.\* Baylor Col. of Med., Houston, Tex.
- H77.** Phylogenetic Analysis of *Helicobacter pylori* by Arbitrary Primer ("Sloppy") Polymerase Chain Reaction DNA Fingerprinting. (134) N. S. AKOPYANZ,\* N. O. BUKANOV, P. FALK, T. U. WESTBLOM, and D. E. BERG. Dept. of Molecular Microbiol., Washington Univ. Med. Sch., and Div. of Infectious Diseases, St. Louis Univ. Med. Sch., St. Louis, Mo.
- H78.** An Uncultured Gastric Spiral in Humans and Other Animals Is a New Species of *Helicobacter*. (136) J. V. SOLNICK,\* J. O'ROURKE, A. LEE, and L. S. TOMPKINS. Stanford Univ., Stanford, Calif., and Univ. of New South Wales, Sydney, Australia.
- H79.** Molecular Evolutionary Genetics of Nonmotile *Salmonella gallinarum* and *Salmonella pullorum*. (138) J. LI,\* N. H. SMITH, and R. K. SELANDER. Pennsylvania State Univ., University Park.
- H80.** Mechanisms of Gene Evolution and Clonal Relationships in Natural Populations of *Salmonella* and *Escherichia coli*. (140) K. NELSON\* and R. K. SELANDER. Pennsylvania State Univ., University Park.
- H81.** Occurrence of Duplicate Lysyl-tRNA Synthetase Genes in *Escherichia coli* and Other Prokaryotes. (142) M. V. SALUTA and I. N. HIRSHFIELD.\* St. John's Univ., Jamaica, N.Y.
- H82.** Reduced Copy Number of rRNA Genes in the Luminous Bacterial Symbiont of *Kryptophanaron alfredi* Relative to Culturable Luminous Bacteria. (144) C. WOLFE\* and M. HAYGOOD. Scripps Inst. of Oceanography, Univ. of California-San Diego, La Jolla.

**Session 38 (F). MOLECULAR BIOLOGY AND MOLECULAR EPIDEMIOLOGY OF FUNGI**

**H83.** Pulsed-Field Gel Electrophoresis of *NotI* Digests of Leptospiral DNA: a New Rapid Method of Serovar Identification. (146) J. L. HERRMANN,\* E. BELLENGER, P. PEROLAT, G. BARANTON, and I. SAINT GIRONS. Inst. Pasteur, Paris, France.

**H84.** rRNA Restriction Patterns as a Taxonomic Tool within *Flavobacterium meningosepticum*. (148) H. COLDING,\* J. BANGSBORG, N. E. FIEHN, T. BENNEKOV, and B. BRUUN. Inst. of Med. Microbiol. and Rigshospitalet, Univ. of Copenhagen, Copenhagen, Denmark.

**H85.** Characterization and Taxonomic Analysis of the Cilia-Associated Respiratory Bacillus of Rats and Rabbits. (150) D. D. CUNDIFF,\* L. K. RILEY, and C. L. BESCH-WILLIFORD. Univ. of Missouri, Columbia.

**H86.** 16S rRNA Sequence Comparison between *Neorickettsia helminthoeca* and *Ehrlichia* spp. (152) C. PRETZMAN,\* Y. RIKIHISA, D. RALPH, and P. FUERST. Ohio State Univ., Columbus, and Mem. Sloan-Kettering Cancer Ctr., New York, N.Y.

**H87.** Cloning of the HSP70 Gene from *Halobacterium marismortui*: Relatedness of Halobacterial HSP70 to Its Eubacterial Homologs and a Model for the Evolution of the HSP70 Gene. (154) R. S. GUPTA\* and B. SINGH. McMaster Univ., Hamilton, Ontario, Canada.

**H88.** Evolution of the Oomycota: the Divergence of Mitochondrial DNA Sequence and Development of "Oomycete-Specific" Primers. (156) D. S. S. HUDSPETH and M. E. S. HUDSPETH.\* Northern Illinois Univ., DeKalb.

**H89.** Restriction Fragment Length Polymorphism and Polymerase Chain Reaction-RAPD Analysis of Genomic DNA from the Fungus *Entomophaga aulicae*. (158) S. R. A. WALSH\* and J. C. SILVER. Div. of Life Sci., Scarborough Campus, Univ. of Toronto, Scarborough, Ontario, Canada.

**H90.** rDNA Restriction Fragment Length Polymorphisms and the Species Concept in *Saccharomyces cerevisiae*. (160) F. I. MOLINA,\* T. INOUE, and S.-C. JONG. American Type Culture Collection, Rockville, Md., and Yamazaki Baking Co., Ltd., Tokyo, Japan.

**H91.** Relative rRNA Diversity within the Tetrahymenine Ciliated Protozoa and the Genera *Paramecium* and *Colpoda*. (162) R. M. PREPARATA, E. M. SIMON,\* and D. L. NANNEY. Univ. of Illinois, Urbana.

**H92.** Genetic Variation among Strains of Black Aspergilli. (164) S. W. PETERSON. Microbial Properties Res., Nat. Ctr. for Agricultural Utilization Res., Agricultural Res. Service, USDA, Peoria, Ill.

**H93.** Chromosome Length Polymorphisms in the Plant Pathogenic Fungus *Cochliobolus sativus*. (166) N. P. KELLER,\* C. FIEGEL, D. BHATNAGAR, and T. E. CLEVELAND. Dept. of Plant Pathology and Microbiol., Texas A&M Univ., College Station, and USDA, Agricultural Res. Service, Southern Regional Res. Ctr., New Orleans, La.

**H94.** Cloning, Primary Structure, and Analysis of the Large Subunit Ribosomal DNA from the Parasite *Toxoplasma gondii*. (168) S. GAGNON\* and R. C. LEVESQUE. Univ. Laval, Ste-Foy, Quebec, Canada.

**H95.** Rapid Genotyping of Human Alcohol Dehydrogenase Alleles Using Liquid Hybridization and Minigel Electrophoresis. (170) L. WILLIAMS,\* J. REIDY, R. LINDSEY, and K. STEINBERG. CDC, Atlanta, Ga.

**H96.** Sequence of 5.8S and 26S rRNA Genes of *Pneumocystis carinii*. (172) Y. LIU,\* M. ROCOURT, M. J. LEIBOWITZ, C. LIU, and S. PAN. Univ. of Med. and Dent. of New Jersey-Robert Wood Johnson Med. Sch., Piscataway.

**F1.** Analysis of a *Pneumocystis carinii* Alpha-Tubulin Gene and a Neighboring Short Repetitive DNA Sequence. (174) J. ZHANG\* and J. R. STRINGER. Univ. of Cincinnati, Cincinnati, Ohio.

**F2.** *Pneumocystis carinii* Contains Proton-Pumping ATPase Genes Closely Related to Fungal Genes. (176) J. C. MEADE. Dept. of Preventive Med., Div. of Parasitology, Univ. of Mississippi Med. Ctr., Jackson.

**F3.** Analysis of the Transcription Factor IID Gene of *Pneumocystis carinii*. (178) S. M. SUNKIN,\* J. ZHANG, and J. R. STRINGER. Univ. of Cincinnati, Cincinnati, Ohio.

**F4.** Linear Plasmid Formation by *Histoplasma capsulatum* and Development of an *Escherichia coli*-*Histoplasma* Telomeric Shuttle Vector. (180) J. P. WOODS\* and W. E. GOLDMAN. Washington Univ. Sch. of Med., St. Louis, Mo.

**F5.** Localization of a Yeast-Phase-Specific Protein to the Cell Wall in *Histoplasma capsulatum*. (182) C. WEAVER, K. SHEEHAN, and E. KEATH.\* St. Louis Univ. and Washington Univ., St. Louis, Mo.

**F6.** Isolation of the *Candida albicans* FAS2 Gene. (184) S. B. SOUTHARD\* and R. L. CIHLAR. Georgetown Univ., Washington, D.C.

**F7.** Multicopy Gene Family Encoding Ribosomal Protein S14 in *Candida albicans*. (186) T. J. BURKE\* and D. D. RHOADS. Dept. of Biol. Sci., Univ. of Arkansas, Fayetteville.

**F8.** Isolation of a Gene Fragment from *Candida albicans* Which Shows Homology with a Gene Essential for the Initiation of Meiosis in *Saccharomyces cerevisiae* (IME2). (188) T. PAYNE and R. CALDERONE.\* Georgetown Univ. Sch. of Med., Washington, D.C.

**F9.** Response of *Candida albicans* to Inhibitory Concentrations of Heavy Metals: Selection-Induced Mutation? (190) M. J. MALAVASIC\* and R. L. CIHLAR. Georgetown Univ., Washington, D.C.

**F10.** Mini-chromosome of *Cryptococcus neoformans*: Origin. (192) A. VARMA\* and K. J. KWON-CHUNG. Nat. Inst. of Allergy and Infectious Diseases, Bethesda, Md.

**F11.** Characterization of a Family of Repetitive DNA Elements in *Cryptococcus neoformans*. (194) E. D. SPITZER\* and S. G. SPITZER. SUNY at Stony Brook, Stony Brook, N.Y.

**F12.** Probe for Typing Strains of *Cryptococcus neoformans*. (196) A. VARMA\* and K. J. KWON-CHUNG. Nat. Inst. of Allergy and Infectious Diseases, Bethesda, Md.

**F13.** Comparative Evaluation of a Chemiluminescent DNA Probe and Exoantigen Test for Rapid Identification of *Histoplasma capsulatum*. (198) A. A. PADHYE,\* G. SMITH, D. MCLAUGHLIN, P. G. STANDARD, and L. KAUFMAN. CDC, Atlanta, Ga.

**F14.** Restriction Enzyme Analysis of an Amplified rDNA Segment from Medically Important Fungi. (200) R. L. HOPFER,\* S. SETTERQUIST, L. H. BURCH, L. MCLAUGHLIN, and W. E. HIGHSMITH, JR. Univ. of North Carolina Hosp., Chapel Hill.

**F15.** Evaluation of Pulse-Field Gel Electrophoresis and Arbitrarily Primed Polymerase Chain Reaction To Analyze the Genome of Clinical Isolates of *Candida parapsilosis*. (202) R. J. KUYKENDALL,\* T. J. LOTT, and B. A. LASKER. CDC, Atlanta, Ga.

**F16.** Genotypic Identification and Characterization of Species and Strains within *Candida* by Using Random Amplified Polymorphic DNA. (204) P. F. LEHMANN,\* D. LIN, and B. A. LASKER. Med. Col. of Ohio, Toledo, and CDC, Atlanta, Ga.

### Session 39 (C). SPECIMEN COLLECTION, TRANSPORT, PROCESSING, AND MANAGEMENT

- C27. Evaluation of Five Urine Screening Methods in Diagnosis of Urinary Tract Infections. (206) K. CARROLL,\* D. HALE, D. VAN BOERUM, G. REICH, L. HAMILTON, and J. MATSEN. ARUP Lab., Wasatch Clin., and Univ. of Utah Med. Ctr., Salt Lake City.
- C28. Urine Screening with a Nucleic Acid Probe. (208) B. WASILAUSKAS\* and R. MORRELL. Wake Forest Univ. Med. Ctr., Winston-Salem, N.C.
- C29. Evaluation of Gram Stain and COBAS MICRO for Screening of Urine Cultures. (210) C. DIAS,\* P. CAUDURO, A. MEZZARI, E. KOCH, and R. HEMB. Lab. Weinmann, Porto Alegre, Brazil.
- C30. Contribution of Rapid Screening Tests in Interpretation of Voided Midstream Urine Cultures. (212) M. YUNGBLUTH,\* L. TUCKER, A. OBIAS, and L. BYRNE. Northwestern Mem. Hosp., Chicago, Ill.
- C31. Comparison of the Rapimat II with Chemstrip 9 as a Screen for Significant Bacteriuria. (214) K. S. KEHL,\* D. SCOTT, and M. ADDY. Kaiser Permanente Northwest Regional Lab., Clackamas, Oreg.
- C32. Comparative Evaluation of the API Uriscreeen and Vitek UID-3 Urine Screening Systems. (216) M. T. DALTON,\* S. COMEAU, B. RAINNIE, K. LAMBERT, and K. R. FORWARD. Dept. of Microbiol., Dalhousie Univ., Victoria Gen. Hosp., Halifax, Nova Scotia, Canada.
- C33. Effect of Two Urine Preservative Agents on Vitek Bac-T-Screen 2000 Screening Results. (218) R. A. VAN ENK. VA Med. Ctr., Dayton, Ohio.
- C34. Initial Testing of a Novel Urine Cultural Device. (220) M. ROSENBERG,\* S. BERGER, M. BARKI, S. GOLDBERG, A. FINK, and A. MISKIN. Tel Aviv Univ., Ichilov Hosp., and Kaplan Hosp., Tel Aviv, Israel.
- C35. Analysis of the Uriscreeen Rapid UTI Test. (222) V. REKASIUS, P. HERRERA,\* J. DIZIKES, and C. R. LIBERTIN. Loyola Univ. of Chicago, Maywood, Ill.
- C36. Evaluation of the URISCREEN for Detection of Bacteriuria and Pyuria. (224) P. J. MALLOY,\* N. J. HELDT, and P. C. SCHRECKENBERGER. Univ. of Illinois, Chicago.
- C37. Comparison of the Uriscreeen Test with Bacterial Urine Culture for the Rapid Detection of Urinary Tract Infection. (226) J. VARGAS, T. COSTA,\* J. KEISER, and D. WILKINSON. Div. of Clin. Pathology, George Washington Univ. Med. Ctr., Washington, D.C.
- C38. Evaluation of Uristat Antibody Detection Assay as an Adjunct in the Diagnosis of Urinary Tract Infections. (228) S. FISHER,\* D. MERRITHEW, B. BURJAW, A. TAMBURRI, P. RUCH, L. AKERFELDT, C. MUNRO, and D. ELLIS-BREEZE. York Central Hosp., Richmond Hill, Ontario, Canada.
- C39. Efficacy of Enzyme-Linked Immunosorbent Assay for Detection of Urinary Tract Immunoglobulins in the Diagnosis of Urinary Tract Infections. (230) J. A. KELLOGG, J. P. MANZELLA,\* J. W. SEIPLE, and S. J. FORTNA. York Hosp., York, Pa.
- C40. Rejection Criteria for Endotracheal Specimens Obtained by Suction. (232) A. MORRIS, D. TANNER,\* and L. B. RELLER. Duke Univ. Med. Ctr., Durham, N.C.
- C41. Clinical Value of Sputum Cultures in Patients with Acceptable Samples by Microscopic Examination. (234) L. G. REIMER. VA Med. Ctr. and Univ. of Utah, Salt Lake City.
- C42. QA and Sputum Screening: Reliability of Interpretation of Gram-Stained Smears and Comparison of Different Screening Criteria. (236) K. SCHOER,\* A. MCGEER, and N. CLERK. Princess Margaret Hosp., Toronto, Ontario, Canada.

- C43. Interinstitutional Assessment of the Quality of Expecto-rated Sputum Collection by Microscopic Examination. (238) R. B. SCHIFMAN,\* F. A. MEIER, and N. BENBOW. Tucson VA Med. Ctr., Tucson, Ariz.; Med. Col. of Virginia, Richmond; and Col. of American Pathologists, Northfield, Ill.
- C44. Alternative Method to Blood Sample Processing for Polymerase Chain Reaction. (240) D. CASAREALE,\* R. DIACO, and R. POTTATHIL. Roche Diagnostic Systems, Inc., Nutley, N.J.
- C45. Comparison of BACTEC Peds Plus, 13A, and Lytic Culture Media versus Conventional Culture for Cultivation of Microorganisms in Fine Needle Aspiration Specimens. (242) T. DAVIS,\* D. FULLER, D. DAVIDSON, K. TABATOWSKI, and R. SCHUEN. Wishard Mem. Hosp.-Indiana Univ. Med. Ctr., Indianapolis, and Mem. Med. Ctr., Springfield, Ill.
- C46. Cost of Selective Processing of Microbiology Specimens. (244) R. BARTLETT,\* J. NIVARD, S. LOBEL, and J. TETREAULT. Hartford Hosp., Hartford, Conn.
- C47. Clinical Usefulness of "Broth Only" Isolates. (246) A. MORRIS,\* S. J. WILSON, C. E. MARX, M. L. WILSON, and L. B. RELLER. Duke Univ. Med. Ctr., Durham, N.C.
- C48. Validation of the Isolator "Isostat" Microbial System for Sterility Testing of Cells in Adoptive Immunotherapy. (248) A. EYLATH, G. DU MOULIN,\* C. CYR, Z. PITKIN, Y. SHEN, V. LIU, and M. E. OSBAND. Cellcor Therapies, Newton, Mass.
- C49. Continuous Ambulatory Peritoneal Dialysis Peritonitis: Microbiology and Culture Techniques. (250) B. GRIPSHOVER,\* A. MORRISSEY, M. FRIEDLANDER, and R. SALATA. Case Western Reserve Univ., Cleveland, Ohio.
- C50. Evaluation of Strep Selective Agar for Recovery of Group A Streptococci from Throat Swabs. (252) A. MCKEOWN\* and R. MURRAY. St. Joseph's Health Ctr., Sarnia, Ontario, Canada.
- C51. Comparative Evaluation of Commercially Available Tryptic Soy and Columbia Blood Agar Base Media. (254) A. PERROLLAZ,\* D. WILSON, C. BORELL, E. GOTTWALD, and R. HAMILTON. Difco Lab., Detroit, Mich.
- C52. Career Plateauing in the Clinical Microbiology Laboratory: a Challenge for the '90s and Beyond. (256) C. BOODRAM. Provincial Lab. of Publ. Health (PLNA), Univ. of Alberta, Edmonton, Alberta, Canada.

### Session 40 (E). VACCINES AND IMMUNE RESPONSES

- E12. Mapping of the Surface-Exposed B-Cell Epitope Recognized by a *Haemophilus influenzae* Type b P1-Specific Protective Monoclonal Antibody. (258) P. CHONG,\* H. PANEZUTTI, E. HANSEN, and M. KLEIN. Connaught Ctr. for Biotech. Res., Willowdale, Ontario, Canada, and Univ. of Texas, Dallas.
- E13. Identification of T- and B-Cell Epitopes of the S4 and S5 Subunit of Pertussis Toxin Using Synthetic Peptides. (260) P. CHONG,\* G. ZOBRIST, C. SIA, and M. KLEIN. Connaught Ctr. for Biotech. Res., Willowdale, Ontario, Canada.
- E14. Recombinant 69K Outer Membrane Protein as a Protective Antigen for *Bordetella pertussis*. (262) P. A. REILLY, L. SUMAVIELLE,\* F. R. VOGEL, K. T. MOUNTZOUROS, and J. COWELL. Lederle, Pearl River, N.Y., and Praxis, Rochester, N.Y.
- E15. Protective Effect of *Bordetella pertussis* Lipopolysaccharide in the Rat Intratracheal Challenge Model of Pertussis. (264) J. GOTTO,\* T. ECKHARDT, J. SCOTT, and D. WOODS. Lederle-Praxis Biologicals, Pearl River, N.Y., and Univ. of Calgary, Calgary, Alberta, Canada.

- E16.** Comparative Phase II Clinical Study with an Acellular DTP Vaccine Containing a Genetically Detoxified Pertussis Toxin and a Whole-Cell DTP Vaccine. (266) L. NENCIONI,\* A. PODDA, E. CARAPPELLA, G. CASCIO, B. CONTU, R. FURLAN, A. MAIDA, A. MOIRAGHI, E. PALLA, D. STRAMARE, F. UXA, and R. RAPPUOLI. Multicenter Study Group for the Evaluation of Recombinant Pertussis Vaccine, Italy.
- E17.** Investigation of the Efficacy of Various Proteinase-Treated *Serpulina (Treponema) hyodysenteriae* Vaccines. (268) D. COYLE,\* A. OSTLE, and C. J. WELTER. AMBICO Inc., Dallas Center, Iowa.
- E18.** Immunization of Guinea Pigs with *Treponema pallidum* Recombinant Antigens Reveals the Presence of Novel Antigens. (270) K. WICHER,\* F. ABBRUSCATO, V. WICHER, L. SCHOOLS, and N. CHATTERJEE. Wadsworth Ctr. for Lab. and Res., New York State Dept. of Health, Albany, and Natl. Inst. for Publ. Health, Bilthoven, The Netherlands.
- E19.** Elucidation of the Epitope and Strain Specificity of a Monoclonal Antibody Directed against the Pilin Protein Adherence Binding Domain of *Pseudomonas aeruginosa* K. (272) W. Y. WONG,\* R. T. IRVIN, W. PARANCHYCH, and R. S. HODGES. Univ. of Alberta, Edmonton, Alberta, Canada.
- E20.** Anti-Idiotypic Antibodies to P-Fimbriated *Escherichia coli*. (274) M. B. KAACK\* and J. A. ROBERTS. Tulane Regional Primate Res. Ctr., Covington, La.
- E21.** Phase I Clinical Trial of Vaginal Mucosal Immunization for Recurrent Urinary Tract Infection. (276) J. M. BASTYR,\* D. T. UEHLING, W. J. HOPKINS, and E. BALISH. Univ. of Wisconsin Med. Sch., Madison.
- E22.** Recognition of an 18-kDa Outer Membrane Glycoprotein as a Cholera Protective Antigen. (278) C. V. SCIORTINO, JR. VA and Univ. of Louisville Sch. of Med., Louisville, Ky.
- E23.** Evaluation of *Shigella* Vaccine Safety and Efficacy in a Mouse Intranasal Challenge Model. (280) C. P. MALLETT,\* L. VAN DE VERG, H. H. COLLINS, and T. L. HALE. Dept. of Enteric Infections, Walter Reed Army Inst. of Res., Washington, D.C.
- E24.** *purA* Complementation as a Means To Deliver Foreign Antigens in Vaccine Strains of *Salmonella*. (282) J. FULGINITI,\* R. BREY, and A. ANILIONIS. Praxis Biologics, Rochester, N.Y.
- E25.** Plasmid-Cured *Salmonella typhimurium* Effective as Live Vaccine for Calves. (284) M. VAN DER WALT\* and A. S. GREEFF. Vet. Res. Inst., Onderstepoort, South Africa, and Medunsa, South Africa.
- E26.** Comparison of Neutralizing Epitopes on Native and Recombinant Herpes Simplex Type 2 Glycoprotein B. (286) S. R. COATES,\* J. M. ROSE, J. T. YAMADA, P. BROWN, B. A. GERVASE, F. MARCUS, and R. L. BURKE. Chiron Corp., Emeryville, Calif.
- E27.** Reactivity of Human Blood Mononuclear Cells to Chlamydial Antigens. (288) J. ARNO\* and M. SHEETS. Indiana Univ. Sch. of Med., Indianapolis.
- E28.** Standardized Enzyme-Linked Immunosorbent Assay for Quantitation of *Neisseria meningitidis* Group C Anticapsular Antibody and Correlation of Antibody Level with Bactericidal Activity. (290) P. K. HOLDER,\* D. R. KAPCZYNSKI, L. L. GHEESLING, S. H. TURNER, and G. M. CARLONE. CDC, Atlanta, Ga.
- E29.** The 37-kDa Protein of *Streptococcus pneumoniae* Protects Mice against Fatal Challenge. (292) D. F. TALKINGTON,\* A. KOENIG, and H. RUSSELL. CDC, Atlanta, Ga.
- E30.** Increased Efficacy of an *Actinobacillus pleuropneumoniae* Bacterin: Inclusion of Soluble Protein Antigens. (294) W. C. CRAY, JR.,\* P. J. FEDORKA-CRAY, M. FIELD, and G. A. ANDERSON. Dept. of Vet. Sci., Univ. of Nebraska, Lincoln;

Nat. Animal Disease Ctr., USDA, Agricultural Res. Service, Ames, Iowa; and SANOFI Animal Health, Lenexa, Kans.

## Session 41 (B). EXOTOXINS: *BORDETELLA*, *CORYNEBACTERIUM*, *PSEUDOMONAS*

- B12.** Production of a Genetically Engineered Pertussis Toxin S1 Subunit by Affinity Expression Cassette-Polymerase Chain Reaction. (296) B. RAUPACH\* and M. A. SCHMIDT. ZMBH, Univ. of Heidelberg, Heidelberg, Germany.
- B13.** Lethality of *Bordetella* Strains for Chicken Embryos Varies with Expression of Pertussis Toxin. (298) G. A. CALVER\* and C. LOCHT. Bureau of Biologics, Health and Welfare Canada, Ottawa, Ontario, Canada, and Lab. de Microbiol. Génétique et Moléculaire, Inst. Pasteur, Lille Cédex, France.
- B14.** Binding of Pertussis Toxin to Glycolipids. (300) S. Z. HAUSMAN\* and D. L. BURNS. Div. of Bacterial Products, FDA, Bethesda, Md.
- B15.** Characterization of a Mutant of *Bordetella pertussis* Having Reduced Levels of Pertussis Toxin in the Culture Supernatant. (302) F. D. JOHNSON,\* A. A. WEISS, and D. L. BURNS. Div. of Bacterial Products, FDA, Bethesda, Md., and Virginia Commonwealth Univ., Richmond.
- B16.** Bacterial Homologs of Selectins. (304) E. TUOMANEN,\* V. MAR, and W. N. BURNETTE. Rockefeller Univ., New York, N.Y., and Amgen, Inc., Thousand Oaks, Calif.
- B17.** Receptor-Enhanced Hydrophobic Binding of Pertussis Toxin. (306) B. SPANGLER, L. HEERZE,\* C. CLARK, and G. ARMSTRONG. Argonne Nat. Lab., Argonne, Ill., and Univ. of Alberta, Edmonton, Alberta, Canada.
- B18.** Mechanism for ATP Activation of Pertussis Toxin. (308) K. M. KRUEGER\* and J. T. BARBIERI. Dept. of Microbiol., Med. Col. of Wisconsin, Milwaukee.
- B19.** Identification and Characterization of a Cell Line Resistant to Intoxication by *Bordetella pertussis* Adenylate Cyclase Toxin. (310) N. J. MALONEY,\* M. C. GRAY, P. FREMGEN, V. M. GORDON, and E. L. HEWLETT. Univ. of Virginia Sch. of Med., Charlottesville.
- B20.** Characterization of Adenylate Cyclase Toxin from BPDE386, a Mutant Defective in *cyaC*. (312) E. L. HEWLETT,\* M. C. GRAY, A. OTERO, I. E. EHRMANN, N. J. MALONEY, G. SZABO, and E. M. BARRY. Univ. of Virginia Sch. of Med., Charlottesville, and Med. Col. of Virginia, Richmond.
- B21.** Regulation and Expression of the *Bordetella pertussis* Adenylate Cyclase Toxin Genes. (314) E. M. BARRY and A. A. WEISS.\* Virginia Commonwealth Univ., Richmond.
- B22.** Genetic Analysis of Dermonecrotic Toxin in the Genus *Bordetella*. (316) K. E. WALKER\* and A. A. WEISS. Virginia Commonwealth Univ., Richmond.
- B23.** Structure-Activity Relationships for *Bordetella pertussis* Tracheal Cytotoxin Compared to Other Muramyl Peptides. (318) K. M. ERWIN,\* J. L. COLLIER, G. R. MARSHALL, and W. E. GOLDMAN. Washington Univ. Sch. of Med., St. Louis, Mo.
- B24.** Regioselective Radiolabeling of *Bordetella pertussis* Tracheal Cytotoxin and Demonstration of Specific Cell Surface Binding. (320) T. A. FLAK,\* B. GOLDMAN, and J. L. COLLIER. Washington Univ. Sch. of Med., St. Louis, Mo.
- B25.** Purification, Characterization, and Genetic Locus of *Bordetella avium* 197 Osteotoxin. (322) C. GENTRY-WEEKS,\* J. M. KEITH, and J. THOMPSON. Nat. Inst. of Dental Res., Bethesda, Md.
- B26.** Genetic Selection of Active-Site Mutants of Diphtheria Toxin Fragment A in *Saccharomyces cerevisiae*. (324) H. FU,\* I. C. MATTHEAKIS, and R. J. COLLIER. Harvard Med. Sch., Boston, Mass.



- B27.** Use of Synthetic Peptides To Identify a Region of Diphtheria Toxin Associated with ADP-Ribosyltransferase Activity. (326) J. OLSON. Med. Univ. of South Carolina, Charleston.
- B28.** Intracellular Expression and Toxicity of a Diphtheria Toxin A Chain That Carries the Same Point Mutation as the ADPr-Transferase-Defective Mutant CRM197. (328) A. B. RAITANO,\* H. J. BELLEN, and B. J. WISNIESKI. UCLA, Los Angeles, Calif., and H.H.M.I., Baylor Col. of Med., Houston, Tex.
- B29.** Evidence that the Diphtheria Toxin-Associated Nuclease Activity Is Intrinsic to the A Subunit and that the Amino-Terminal Region Is Involved. (330) S. LESSNICK,\* L. CHAU, and B. WISNIESKI. UCLA, Los Angeles, Calif.
- B30.** Purification and Characterization of the *Corynebacterium diphtheriae* Toxin Repressor Protein. (332) M. P. SCHMITT,\* E. M. TWIDDY, and R. K. HOLMES. Uniformed Services Univ. of the Health Sci., Bethesda, Md.
- B31.** Transcription Analysis of *tox* Promoter/Operator Mutants of *Corynebacteriophage*  $\beta$ . (334) A. E. KRAFFT. Uniformed Services Univ. of the Health Sci., Bethesda, Md.
- B32.** Cleavage of Diphtheria Toxin and the Protective Antigen of *Bacillus anthracis* by the Eukaryotic Endoprotease Furin. (336) K. R. KLIMPEL,\* S. S. MOLLOY, P. A. BRESNAHAN, G. THOMAS, and S. H. LEPLA. Lab. of Microbial Ecology, Nat. Inst. of Dent. Res., Bethesda, Md., and Vollum Inst. for Advanced Biomed. Res., Oregon Health Sci. Univ., Portland.
- B33.** Potent Hybrid Cytotoxins of Anthrax Toxin Lethal Factor and the ADP-Ribosylation Domain of *Pseudomonas* Exotoxin A Are Translocated Directly to the Cytosol of Mammalian Cells. (338) A. ARORA\* and S. H. LEPLA. Lab. of Microbial Ecology, Nat. Inst. of Dent. Res., Bethesda, Md.
- B34.** Screening *Pseudomonas aeruginosa* Isolates for the Cytotoxin Gene. (340) L. H. BOPP,\* A. BALTCH, M. FRANKE, and F. LUTZ. VA Med. Ctr. and Albany Med. Col., Albany, N.Y.; Univ. of Southern Mississippi, Hattiesburg; and Univ. of Giessen, Giessen, Germany.
- B35.** Toxin A Excretion in *Pseudomonas aeruginosa*: Role of the Amino- and Carboxyl-Terminal Regions. (342) C. S. MCVAY\* and A. N. HAMOOD. Texas Tech Univ. Health Sci. Ctr., Lubbock.
- B36.** Isolation of a Gene(s) Involved in Toxin A Synthesis and Excretion in *Pseudomonas aeruginosa*. (344) A. N. HAMOOD. Texas Tech Univ. Health Sci. Ctr., Lubbock.
- B37.** Cloning of a DNA Region of *Pseudomonas aeruginosa* Involved in Exotoxin A Regulation. (346) A. K. SAMPLE\* and S. E. H. WEST. Univ. of Wisconsin, Madison.
- B38.** Activity of the *regAB* P1 Promoter Is Restored in Fe18, a Hypertoxin-Producing Mutant of *Pseudomonas aeruginosa* PAO1. (348) J. Y. ALI\* and D. G. STOREY. Univ. of Calgary, Calgary, Alberta, Canada.
- B39.** Expression of *Pseudomonas aeruginosa* *regA*, *regB*, and *toxA* in the Lungs of Patients with Cystic Fibrosis. (350) T. L. RAIVIO,\* E. E. UJACK, and D. G. STOREY.\* Univ. of Calgary, Calgary, Alberta, Canada.
- B40.** Expression and Localization of Proteins Encoded by the *Pseudomonas aeruginosa* Exoenzyme S *trans*-Regulatory Locus. (352) A. K. HOVEY\* and D. W. FRANK. Med. Col. of Wisconsin, Milwaukee.
- B41.** Properties of a Chinese Hamster Ovary Cell Elongation Factor Produced by *Pseudomonas aeruginosa*. (354) M. H. KOTHARY\* and E. F. CLAVERIE. FDA, Washington, D.C.

## Session 42 (B). HEMOLYSIN, UREASE, PHOSPHATASE, PROTEASE, LIPASE

- B42.** Mapping the Porcine Leukocyte Specificity Determinant of the *Actinobacillus pleuropneumoniae* Hemolysin. (356) D. R. MCWHINNEY,\* R. F. YOUNG, and D. K. STRUCK. Texas A&M Univ., College Station.
- B43.** Hemolysis of Sheep Erythrocytes by *Eikenella corrodens*. (358) J. T. HELBER\* and R. HIRSCHBERG. Univ. of Missouri, Kansas City.
- B44.** Calcium-Dependent Cytotoxicity of *Escherichia coli* Hemolysin against Polymorphonuclear Leukocytes. (360) A. K. MCCUNE\* and D. F. BOEHM. California Univ. of Pennsylvania, California, Pa.
- B45.** Structure-Function Relationship of *Escherichia coli*  $\alpha$ -Hemolysin in Cytokine Release and in Cytokine-Specific mRNA expression. (362) B. KONIG,\* A. LUDWIG, W. GOEBEL, and W. KONIG. Med. Mikrobiologie Immunologie AG Infektabwehr Ruhr-Univ. Bochum, Bochum, Germany, and Inst. für Genetik und Mikrobiologie, Univ. Würzburg, Würzburg, Germany.
- B46.** Structure-Function Relationship of *Escherichia coli* Alpha-Hemolysin on Mediator Release from Inflammatory Cells (Granulocytes, Platelets, Basophils, Mast Cells). (364) B. KONIG,\* A. SCHMITZ, A. LUDWIG, W. GOEBEL, and W. KONIG. Med. Mikrobiologie und Immunologie AG Infektabwehr, Ruhr Univ., Bochum, Germany, and Inst. für Genetik und Mikrobiologie, Univ. Würzburg, Würzburg, Germany.
- B47.** Intraperitoneal Hemoglobin Does Not Increase the Growth Rate of Hemolytic *Escherichia coli*. (366) M. SPENGLER,\* A. MAY, D. GROSCHEL, and T. PRUETT. Univ. of Virginia, Charlottesville.
- B48.** Heme Acquisition and Hemolysin Production by *Campylobacter jejuni*. (368) E. PESCI\* and C. PICKETT. Univ. of Kentucky, Lexington.
- B49.** Suicide Vectors for Construction of Hemolysin and P Fimbrial Isogenic Mutants of Uropathogenic *Escherichia coli*. (370) E. A. CONCAUGH,\* J. P. ELWOOD, G. R. CHIPPENDALE, K. G. GICQUELAIS, D. I. WHITTLE, M. S. DONNENBERG, and J. W. WARREN. Univ. of Maryland Sch. of Med., Baltimore.
- B50.** Identification and Characterization of Deformin Released by *Bartonella bacilliformis*. (372) Y.-H. XU,\* Z.-Y. LU, and G. M. IHLER. Texas A&M Univ., College Station.
- B51.** Virulence Factors of *Aeromonas* Strains Isolated from Environmental Samples. (374) P. SIMARD,\* M. HANDFIELD, L. AUDET, and R. LETARTE. Dept. of Microbiol., Faculty of Med., Laval Univ., Ste-Foy, Quebec, Canada.
- B52.** Assembly of *Helicobacter pylori* Urease Subunits (UreA, UreB) in *Escherichia coli* Does Not Require UreC. (376) L. T. HU,\* P. A. FOXALL, and H. L. T. MOBLEY. Univ. of Maryland Sch. of Med., Baltimore.
- B53.** Characteristics of *Helicobacter pylori* Strains Selected for Urease Deficiency. (378) G. I. PEREZ-PEREZ,\* A. Z. OLIVARES, C. MUSSOT, T. L. COVER, and M. J. BLASER. Div. of Infectious Diseases, Vanderbilt Univ., and Dept. of Veterans Affairs Med. Ctr., Nashville, Tenn.
- B54.** Identification of Putative Regulatory Genes in the Plasmid-Encoded Urease Gene Cluster of *Enterobacteriaceae*. (380) S. E. D'ORAZIO\* and C. M. COLLINS. Dept. of Microbiol. and Immunology, Univ. of Miami Sch. of Med., Miami, Fla.
- B55.** *Proteus mirabilis* Urease: Histidine-320 of UreC Is an Essential Amino Acid for Urea Hydrolysis. (382) B. SRIWANTHANA\* and H. L. T. MOBLEY. Univ. of Maryland Sch. of Med., Baltimore.

- B56.** Purification and Partial Characterization of a Major Acid Phosphatase of *Francisella tularensis*: Identification as a Putative Virulence Factor. (384) T. REILLY,\* J. WILLIAMS, and M. S. KUHNLENSCHMIDT. Univ. of Illinois, Urbana, and FDA, Bethesda, Md.
- B57.** Acid Phosphatase Activity in *Coxiella burnetii*. (386) M. ROMAN, A. SAHA, R. CHRISTNER, J. BUEHLER, R. GLEW, and O. BACA.\* Univ. of New Mexico, Albuquerque.
- B58.** Relationship of the *Vibrio cholerae* Hemagglutinin/Protease to Other Bacterial Zinc/Calcium-Metalloendoproteases. (388) C. HASE\* and R. A. FINKELSTEIN. Univ. of Missouri, Columbia.
- B59.** Cloning of a Virulence Factor Suggested To Be Involved in the Invasive Mechanism of *Vibrio anguillarum*. (390) D. MILTON,\* A. NORQVIST, and H. WOLF-WATZ. Univ. of Umea, Umea, Sweden.
- B60.** ATPase and Autophosphorylation Activities Determine Virulence of VirB11 Protein in *Agrobacterium*. (392) K. M. STEPHENS,\* C. ROUSH, and E. NESTER. Univ. of Washington, Seattle.
- B61.** Analysis of *Pseudomonas aeruginosa* LasA Production. (394) L. C. FRECK,\* D. R. GALLOWAY, and A. DARZINS. Dept. of Microbiol., Ohio State Univ., Columbus.
- B62.** Inhibition of Lytic Activity of *Pseudomonas aeruginosa* Elastase by Monoclonal Antibodies. (396) J. LAGACE\* and M. BOUCHARD. Univ. of Montreal, Montreal, Quebec, Canada.
- B63.** Secreted LasA of *Pseudomonas aeruginosa* Is a Staphylytic Protease. (398) E. KESSLER,\* J. C. OLSON, and D. E. OHMAN. Goldschleger Eye Inst., Tel-Aviv Univ., Sheba Hosp., Israel; Med. Univ. of South Carolina, Charleston; and Univ. of Tennessee, Memphis.
- B64.** Modulatory Role of *Pseudomonas aeruginosa* Lipase on Mediator Release from Human Inflammatory Cells. (400) B. KONIG, K.-E. JAEGER,\* and W. KONIG. Med. Mikrobiologie und Immunologie AG Infek. abwehr and Lehrstuhl Biol. der Mikroorganismen, Ruhr Univ., Bochum, Germany.
- B65.** Inhibition of Rat Alveolar Macrophage Phagocytic Functions by a *Pseudomonas cepacia* Lipase. (402) D. C. STRAUS,\* M. K. LONON, and J. C. HUTSON. Texas Tech Univ. Health Sci. Ctr., Lubbock, and Miami Univ., Oxford, Ohio.

**Session 43 (Committee on General Meeting Planning, BET). Seminar**

(Eligible for continuing education credit)

**UPDATE '92 I**

Wednesday, 12:00 Noon, Room 103

Convenors: JOHN M. LAMMERT, Gustavus Adolphus Col., St. Peter, Minn., and JOHN CLAUSZ, Carroll Col., Waukesha, Wis.

Update '92 in Regulatory T Lymphocytes  
PHILLIP BAKER, Nat. Inst. of Allergy and Infectious Diseases, Rockville, Md.



**Session 44 (C). Seminar**  
(Eligible for continuing education credit)

**COST-EFFECTIVE, CLINICALLY RELEVANT MICROBIOLOGY FOR THE 1990s**

Wednesday, 1:30 P.M., Ballroom IA

Convenors: RAYMOND C. BARTLETT, Hartford Hosp., Hartford, Conn., and JAMES C. MCLAUGHLIN, Univ. of New Mexico Med. Ctr., Albuquerque

Historical Overview

RAYMOND C. BARTLETT, Hartford Hosp., Hartford, Conn.

Culture Methods in Bacteriology

SUSAN E. SHARP, Mount Sinai Med. Ctr., Miami, Fla.

Non-Culture Methods

MARIO J. MARCON, Children's Hosp., Columbus, Ohio

Virology

LISA A. WEYMOUTH, Univ. of Rochester Med. Ctr., Rochester, N.Y.

Role of Computers

MARK A. DYKSTRA, Res. Med. Ctr., Kansas City, Mo.

Implementing Change

ANN ROBINSON, Hartford Hosp., Hartford, Conn.



**Session 45 (C). Seminar**  
(Eligible for continuing education credit)

**EMERGING PATHOGENS IN THE IMMUNOCOMPROMISED HOST**

Wednesday, 1:30 P.M., Ballroom IB

Convenors: PAUL A. GRANATO, Crouse Irving Mem. Hosp., Syracuse, N.Y., and BETTY A. FORBES, SUNY Health Sci. Ctr., Syracuse, N.Y.

*Mycobacterium haemophilum*

TIMOTHY E. KIEHN, Mem. Sloan-Kettering Hosp., New York, N.Y.

Microsporidia

RALPH T. BRYAN, CDC, Atlanta, Ga.

Human Herpesvirus 6

DONALD CARRIGAN, Med. Col. of Wisconsin, Milwaukee

*Mycoplasma fermentans* (incognitus Strain)

SHYH-CHING LO, Armed Forces Inst. of Pathology, Washington, D.C.

Blue-Green Algae

EARL G. LONG, CDC, Atlanta, Ga.

WEDNESDAY

**Session 46 (V). Seminar**  
(Eligible for continuing education credit)

**STRATEGY OF ISOLATION AND DETECTION  
OF HUMAN IMMUNODEFICIENCY VIRUS  
TO ACHIEVE ACCURATE DIAGNOSIS**

Wednesday, 1:30 P.M., Room 10

*Convenors:* NARAYAN C. KHAN, Braton Biotech, Inc., Rockville, Md., and GEORGE H. KELLER, Cambridge Biotech, Rockville, Md.

Overview

NARAYAN C. KHAN, Braton Biotech, Inc., Rockville, Md.

Isolation of Human Immunodeficiency Virus (HIV): a Confirmatory Procedure for HIV Detection

SUSAN GARTNER, Henry M. Jackson Fndn., Rockville, Md.

Supplementary Assays To Evaluate Human Immunodeficiency Virus Antigen/Antibody-Positive and -Negative Specimens

SUSHIL G. DEVARE, Abbott Lab., Abbott Park, Ill.

Analysis of Indeterminate Human Immunodeficiency Virus Western Blots

STEVE ALEXANDER, Cambridge Biotech, Rockville, Md.

Polymerase Chain Reaction for Human Immunodeficiency Virus Detection: How To Ensure Correct Analysis

GEORGE H. KELLER, Cambridge Biotech, Rockville, Md.

**Session 47 (R). Seminar**  
(Eligible for continuing education credit)

**MOLECULAR EVOLUTION AND  
SYSTEMATICS OF FUNGI**

Wednesday, 1:30 P.M., Room 37

*Convenors:* CLETUS P. KURTZMAN, Nat. Ctr. for Agricultural Utilization Res., Peoria, Ill., and MEREDITH BLACKWELL, Louisiana State Univ., Baton Rouge

Evolution and Identification of Human Pathogenic Ascomycetes

JOHN W. TAYLOR, Univ. of California, Berkeley

Perithecial Ascomycetes: Their Association with Insects

MEREDITH BLACKWELL and JOSEPH W. SPATFORA, Louisiana State Univ., Baton Rouge

Differences in Rates and Modes of Evolution between Homologous Regions of Nuclear and Mitochondrial Small Subunit rRNA in Fungi

THOMAS D. BRUNS, Univ. of California, Berkeley

Evolution of Ribosomal DNA Internal Transcribed Spacers in *Fusarium* and Other Fungi

KERRY L. O'DONNELL, Nat. Ctr. for Agricultural Utilization Res., Peoria, Ill.

Systematics of Fungi in the *Rhizoctonia* Complex

RYTAS J. VILGALYS, Duke Univ., Durham, N.C.

Evolutionary Relationships of Ascomycetous Yeasts  
CLETUS P. KURTZMAN, Nat. Ctr. for Agricultural Utilization Res., Peoria, Ill.

**Session 48. Divisional Group II Symposium**  
(Eligible for continuing education credit)

**MICROBIAL DEVELOPMENT**

Wednesday, 1:30 P.M., Room 39

*Convenors:* LUCY SHAPIRO, Stanford Univ. Sch. of Med., Stanford, Calif., and SHARON LONG, Stanford Univ., Stanford, Calif.

Aerial Mycelium Formation in Streptomycetes

RICHARD LOSICK, Harvard Univ., Cambridge, Mass.

Intercellular Signals Controlling Sigma Factor Activity during Sporulation in *Bacillus subtilis*

PATRICK STRAGIER, Inst. de Biol. Physico-Chimique, Paris, France

Control of Spatial Organization and Asymmetry in *Caulobacter*

LUCY SHAPIRO, Stanford Univ. Sch. of Med., Stanford, Calif.

Regulated Gene Expression for an Intracellular Pathogen

DAN PORTNOY, Univ. of Pennsylvania, Philadelphia

*Rhizobium* Genes and Molecular Signals Controlling Symbiotic Development

SHARON LONG, Stanford Univ., Stanford, Calif.



**Session 49 (U). Seminar**  
(Eligible for continuing education credit)

**MOLECULAR BIOLOGY IN THE DIAGNOSIS  
AND EPIDEMIOLOGY OF TUBERCULOSIS:  
FROM BENCH TO BEDSIDE**

Wednesday, 1:30 P.M., Room 100

*Convenors:* THOMAS M. DANIEL, Case Western Reserve Univ., Cleveland, Ohio, and JACK T. CRAWFORD, CDC, Atlanta, Ga.

Molecular Biology and Tuberculosis: an Overview

THOMAS M. SHINNICK, CDC, Atlanta, Ga.

*Mycobacterium tuberculosis* and the Polymerase Chain Reaction

KATHLEEN D. EISENACH, McClellan Mem. VA Hosp., Little Rock, Ark.

*Mycobacterium tuberculosis* and DNA Fingerprinting

JACK T. CRAWFORD, CDC, Atlanta, Ga.

Clinical Epidemiology and the Diagnosis of Tuberculosis

THOMAS M. DANIEL, Case Western Reserve Univ., Cleveland, Ohio

Molecular Biology and the Epidemiology of Tuberculosis

PHILIP C. HOPEWELL, Univ. of California, San Francisco



**Session 50 (BET). Round Table**  
(Eligible for continuing education credit)

**CRITICAL THINKING OR PROBLEM SOLVING SKILLS**

Wednesday, 1:30 P.M., Room 103

Convenors: THOMAS J. HAGEN, Univ. of Georgia, Athens, and STEPHEN R. KARR, Carson-Newman Col., Jefferson City, Tenn.

As educators, we all agree that it is important to teach our students critical thinking and problem solving skills. The difficulty is in developing strategies for the effective instruction of these skills. In this session we will address the use of "writing in the curriculum," "concept mapping," "case studies," and "problem solving exercises" in both lecture and laboratory situations. In addition, there will be a presentation about the nature of educational materials prepared for this type of instruction and the expectations of employers as to the types of skills they would like microbiology undergraduates to possess. The participants will discuss strategies they are using in lecture and laboratory situations at institutions ranging from large universities to two-year colleges and for the development of educational materials. The session will begin with an introductory statement about critical thinking or problem solving, followed by approximately 30-minute talks by each of the speakers concerning the particular instructional strategies or materials they have developed, and will conclude with a panel discussion between the speakers and the audience.

Participants: SALLY S. DEGROOT, LISA S. DONOHOE, THOMAS J. HAGEN, LORINDA S. MEYERS, and STEPHEN R. KARR

**Session 51 (D)**

**MOLECULAR BIOLOGY OF TREPONEMES AND OTHER SPIROCHETES**

Wednesday, 1:30 P.M., Room 2

Moderators: THOMAS FITZGERALD, Univ. of Minnesota, Duluth, and RONALD J. LIMBERGER, New York State Dept. of Health, Albany

1:30

- D11. Construction and Initial Characterization of a Leptospiral Gamma DNA Library. D. J. WHITE,\* R. J. SHOBERG, and D. D. THOMAS. Univ. of Texas Health Sci. Ctr., San Antonio.
- D12. Cloning and Sequencing of the 16S rRNA Gene from *Treponema pallidum*. P. KEBRIAEI\* and V. V. TRYON. Univ. of Texas Health Sci. Ctr., San Antonio.
- D13. Identification of Two Common Surface Antigens in *Treponema denticola* Strains. A. NILIUS\* and L. SIMONSON. Naval Dent. Res. Inst., Great Lakes, Ill.
- D14. Molecular Cloning, DNA Sequencing, and Expression of a Class B Periplasmic Flagella Gene of *Treponema phagedenis*. R. J. LIMBERGER,\* L. SLIVIENSKI, D. B. YELTON, and N. W. CHARON. Wadsworth Ctr., New York State Dept. of

Health, Albany, and Dept. of Microbiol. and Immunology, West Virginia Univ., Morgantown.

2:30

- D15. Cloning and Characterization of *Spirochaeta aurantia* Periplasmic Flagellar Filament Genes. J. PARALES\* and E. P. GREENBERG. Univ. of Iowa, Iowa City.
- D16. Identification of a Conserved Gene in *Treponema phagedenis*, *Treponema pallidum*, and *Borellia burgdorferi* That Is Homologous to the *flg* Genes of *Salmonella typhimurium*. R. J. LIMBERGER,\* L. L. SLIVIENSKI, and K. CRONIN. Wadsworth Center, New York State Dept. of Health, Albany.
- D17. Comparative Molecular Analysis of Virulent and Avirulent Strains of *Borrelia anserina*. E. D. TULLSON,\* B. C. ZINGG, and R. B. LEFEBVRE. Univ. of California, Davis.
- D18. *phoA* Expression Library for *Treponema pallidum*. T. S. JONES,\* J. B. BASEMAN, and V. V. TRYON. Univ. of Texas Health Sci. Ctr., San Antonio.

3:30

- D19. Production of Rheumatoid Factors in Adoptively Immune Guinea Pigs after Challenge with *Treponema pallidum*. R. E. BAUGHN,\* K. WICHER, V. WICHER, and L. GRADY. Baylor Col. of Med. and VA Ctr., Houston, Tex., and Wadsworth Ctr. for Lab. and Res., New York State Dept. of Health, Albany.
- D20. Congenital Infection with *Treponema pallidum* in C4-Deficient Guinea Pigs Is Associated with T-Cell Activation. V. WICHER,\* J. ZHAO, K. WICHER, and R. BURGER. Wadsworth Ctr. for Lab. and Res., New York State Dept. of Health, Albany, and Dept. of Immunology, Robert Koch Inst., Berlin, Germany.
- D21. Binding of Human Lactoferrin, but Not Transferrin, by *Treponema denticola* GM1. M. L. RUSSELL,\* J. B. BASEMAN, S. C. HOLT, and V. V. TRYON. Univ. of Texas Health Sci. Ctr., San Antonio.
- D22. A Different Phenotype of *Borrelia burgdorferi* Found in Patients with Disseminated Extracutaneous Lyme Borreliosis. A. VAN DAM,\* J. KUIPER, K. VOS, A. WIDJOKUSUMO, L. SPANJAARD, A. RAMSELAAR, B. DE JONGH, and J. DANKERT. Dept. of Med. Microbiol., Dept. of Neurology, and Dept. of Dermatology, Univ. of Amsterdam, Amsterdam, The Netherlands.

**Session 52 (B). Seminar**

(Eligible for continuing education credit)

**MOLECULAR BIOLOGY OF BACTERIAL RESPIRATORY DISEASES**

Wednesday, 1:30 P.M., Room 5

Convenors: SUSAN FROSHAUER and CATHERINE P. REESE, Pfizer Inc., Groton, Conn.

Bacterial Adhesins, Leukocyte Adhesion Molecules, and Pneumonia  
ELAINE TUOMANEN, Rockefeller Univ., New York, N.Y.

Tracheal Cytotoxin and the Respiratory Pathology of Pertussis  
WILLIAM E. GOLDMAN, Washington Univ., St. Louis, Mo.

WEDNESDAY

Leukotoxin Negative Mutants of *Pasteurella haemolytica*  
GEORGE M. WEINSTOCK, Univ. of Texas Med. Sch.,  
Houston

Determinants of *Pseudomonas aeruginosa* Respiratory Tract  
Colonization  
STEPHEN LORY, Univ. of Washington, Seattle

Molecular Pathogenesis of Legionnaires Disease  
HOWARD SHUMAN, Columbia Univ., New York, N.Y.

**Session 53 (D). Seminar**

(Eligible for continuing education credit)

**MODEL SYSTEMS IN SEXUALLY  
TRANSMITTED DISEASE RESEARCH: FROM  
TISSUE CULTURE TO EXPERIMENTAL  
HUMAN INFECTION**

Wednesday, 1:30 P.M., Room 21

Convenors: JOSEPH M. CARLIN, Miami Univ., Oxford, Ohio,  
and HANK S. SEIFERT, Northwestern Univ. Sch. of Med.,  
Chicago, Ill.

*Chlamydia*-Like Polarized Human Cells In Vitro  
PRISCILLA B. WYRICK, Univ. of North Carolina Sch. of  
Med., Chapel Hill

Interactions of the Pathogenic Neisseriae with Eukaryotic Cells  
MAGDALENE SO, Oregon Health Sci. Univ., Portland

Investigation of the Pathogenesis of Chancroid: Possibilities and  
Problems  
ERIC J. HANSEN, Univ. of Texas Southwestern Med. Ctr.,  
Dallas

Immunoregulation in Experimental Rabbit Syphilis: Applications  
to Vaccine Development  
THOMAS J. FITZGERALD, Univ. of Minnesota Sch. of  
Med., Duluth

Dynamics of Gonococcal Opacity Protein during Experimental  
Human Infection  
ANN JERSE, Univ. of North Carolina Sch. of Med., Chapel  
Hill

**Session 54 (F). Seminar**

(Eligible for continuing education credit)

**FUNGAL ENZYMES AS MARKERS OF  
DISEASE ACTIVITY**

Wednesday, 1:30 P.M., Room 27

Convenors: CHRISTINE J. MORRISON, CDC, Atlanta, Ga.,  
and ERIC S. JACOBSON, McGuire VA Med. Ctr., Rich-  
mond, Va.

$\beta$ -Glucosidase of *Coccidioides immitis*  
GARRY T. COLE, Univ. of Texas, Austin

Aspartyl Proteinase of *Candida albicans*  
CHRISTINE J. MORRISON, CDC, Atlanta, Ga.

Phenol Oxidase of *Cryptococcus neoformans*  
ERIC S. JACOBSON, McGuire VA Med. Ctr., Richmond,  
Va.

18-kDa Ribotoxin of *Aspergillus fumigatus*  
KENNETH A. HAYNES, Charing Cross and Westminster  
Med. Sch., London, England

Enolase of *Candida albicans*  
HELEN R. BUCKLEY, Temple Univ. Health Sci. Ctr.,  
Philadelphia, Pa.

Catalase of *Histoplasma capsulatum* and Collagenase of *Crypto-  
coccus neoformans*  
ANDREW J. HAMILTON, Guy's Hosp., London, England

**Session 55 (E). Seminar**

(Eligible for continuing education credit)

**ENDOTOXIN EFFECTS ON SIGNAL  
TRANSDUCTION**

Wednesday, 1:30 P.M., Room 16

Convenors: JUDY A. SPITZER, Louisiana State Univ. Med.  
Ctr., New Orleans, and SAMUEL D. WRIGHT, Rockefeller  
Univ., New York, N.Y.

Signal Transduction in Hepatic and Alveolar Macrophages in  
Endotoxemia  
JUDY A. SPITZER, Louisiana State Univ. Med. Ctr., New  
Orleans

Role of Serum Proteins in Responses to Endotoxin  
SAMUEL D. WRIGHT, Rockefeller Univ., New York, N.Y.

Activation of Neutrophils by Lipopolysaccharide (LPS): Inacti-  
vation of LPS by Neutrophils  
MICHAEL J. PABST, Univ. of Tennessee, Memphis

Role of Novel Purino-Receptors in Endotoxin-Mediated Macro-  
phage Activation  
RICHARD A. PROCTOR, Univ. of Wisconsin, Madison

Lipopolysaccharide (LPS) Antagonists and Their Relationships  
to LPS Receptors  
DOUGLAS GOLENBOCK, Boston City Hosp., Boston,  
Mass.

Genetic Analysis of Lipopolysaccharide Action in B Lympho-  
cytes  
CAROL H. SIBLEY, Univ. of Washington, Seattle

**Session 56 (I). Seminar**  
(Eligible for continuing education credit)

**CENTRAL PHYSIOLOGICAL PROCESSES  
PERFORMED BY PHOTOTROPHIC BACTERIA**

Wednesday, 1:30 P.M., Room 36

Convenors: TIMOTHY DONOHUE and PAUL LUDDEN,  
Univ. of Wisconsin, Madison

Molecular Biology and Biochemistry of Photosynthetic Carbon  
Dioxide Assimilation  
ROBERT TABITA, Ohio State Univ., Columbus

Genetics and Physiology of the *Rhodospirillum rubrum* Carbon  
Monoxide Dehydrogenase System  
ROBERT KERBY, Univ. of Wisconsin, Madison

Integrating Nitrogen Metabolism in Phototrophs: ADP Ribosyl-  
ation of Nitrogenase and Glutamine Synthetase in *Rhodo-  
spirillum rubrum*  
PAUL LUDDEN, Univ. of Wisconsin, Madison

Metabolic Regulation in *Rhodobacter sphaeroides*  
SAMUEL KAPLAN, Univ. of Texas Med. Sch., Houston

Cytochrome Biosynthesis in *Rhodobacter sphaeroides*  
TIMOTHY DONOHUE, Univ. of Wisconsin, Madison

**Session 57 (T)**

**RNA VIRUSES II**

Wednesday, 1:30 P.M., Room 93

Moderators: RONALD LUFTIG, Louisiana State Univ. Med.  
Ctr., New Orleans, and PAUL K. Y. WONG, Univ. of Texas  
M.D. Anderson Cancer Ctr., Smithville

**1:30 Divisional Lecture**  
(Eligible for continuing education credit)

Replication of Alphaviruses: Engineering Transient Gene Ex-  
pression Vectors Using a Positive-Strand RNA Virus  
CHARLES RICE, Washington Univ. Sch. of Med., St. Louis,  
Mo.

2:30

T30. Expression of Functional Fab Antibody Fragments Which  
Bind Coat Protein Subunit of Potyviruses. L. M. PALMER\*  
and R. L. JORDAN. USDA, Agricultural Res. Service, Plant  
Sci. Inst., Florist and Nursery Crops Lab., Beltsville, Md.

T31. Identification of a Ganglioside Fraction Involved in  
Porcine Rotavirus Recognition of MA-104 Cells and Enteroc-  
ytes. M. ROLSMA,\* H. GELBERG, G. SCHERBA, and M.  
S. KUHLENSCHMIDT. Univ. of Illinois, Urbana.

T32. Comparisons of Rotavirus VP7 Typing Monoclonal  
Antibodies by a Competition Binding Assay. P. RAJ,\* D. O.  
MATSON, and M. K. ESTES. Baylor Col. of Med., Houston,  
Tex.

T33. A Major Antibody Component of the Acute Human  
Immune Response to the Hepatitis E Virus Is Directed against

the RNA-Dependent RNA Polymerase. M. KAUR,\* K. C.  
HYAMS, M. A. PURDY, K. KRAWCZYNSKI, W. M.  
CHING, K. E. FRY, G. R. REYES, D. W. BRADLEY, and  
M. CARL. Naval Med. Res. Inst., Bethesda, Md.; Hepatitis  
Div., CDC, Atlanta, Ga.; and Genelabs Inc., Redwood City,  
Calif.

3:30

T34. Protective Role of CD8<sup>+</sup> T Cells In Vivo against Murine  
Retrovirus-Induced Neurological Disorders and Immunodefi-  
ciency Is Enhanced by the Presence of CD4<sup>+</sup> T Cells. K.  
SAHA\* and P. K. Y. WONG. Univ. of Texas-M.D. Anderson  
Cancer Ctr., Smithville.

T35. Murine Leukemia Virus Protease Is Responsible for  
Altering the Actin Cytoskeleton of Infected Fibroblasts. R.  
LUFTIG\* and D. LUPO. Louisiana State Univ. Med. Ctr.,  
New Orleans.

T36. Insertion Mutation of *int* Protooncogenes in Mammary  
Tumors of Chinese Wild Mice: Normal and Tumor Tissue-  
Specific Expression of *int-3* Transcripts. N. SARKAR,\* S.  
HAGA, A. LEHNER, W. ZHAO, S. IMAI, and K. MOIKI-  
WAKI. Med. Col. of Georgia, Augusta; Nara Med. Univ.,  
Japan; and Nat. Inst. of Genetics, Japan.

T37. Cooperating Events in Leukemogenesis Mediated by a  
*myc*-Containing Strain of Feline Leukemia Virus. L. S. LEVY\*  
and P. A. LOBELLE-RICH. Tulane Univ. Sch. of Med., New  
Orleans, La.

**Session 58 (E)**

**MECHANISMS OF PROTECTIVE IMMUNITY:  
CYTOKINES AND ISOTYPE-SPECIFIC  
ANTIBODY RESPONSES**

Wednesday, 1:30 P.M., Room 1

Moderators: SUZANNE M. MICHALEK, Univ. of Alabama,  
Birmingham, and CHRISTOPHER E. TAYLOR, Nat. Inst.  
of Allergy and Infectious Diseases, Rockville, Md.

1:30

E31. Immunoglobulin G Subclass Response to *Porphyromonas*  
(*Bacteroides*) *gingivalis*: T-Cell Regulation. J. KATZ,\* D. C.  
WARD, C. C. HARMON, and S. M. MICHALEK. Univ. of  
Alabama, Birmingham.

E32. Effects of Gamma Interferon on the Antibody Response to  
*Pseudomonas aeruginosa* Lipopolysaccharide. C. E. TAY-  
LOR\* and M. B. FAUNTLEROY. Lab. of Immunogenetics,  
Nat. Inst. of Allergy and Infectious Diseases, Rockville, Md.

E33. Antibody Hyporesponsiveness in Susceptible Mice Is  
Restricted to Corneal Infection. M. J. PRESTON and R. S.  
BERK.\* Wayne State Univ., Detroit, Mich.

E34. Role of CD4<sup>+</sup> T Cells in Resistant DBA/2 Mice  
Intracorneally Infected with *Pseudomonas aeruginosa*. M. J.  
PRESTON,\* H. Y. TSE, and R. S. BERK. Wayne State Univ.  
Sch. of Med., Detroit, Mich.

2:30

E35. Antibody Isotypes in Mice Vaccinated with *Brucella*  
*abortus* Porin-S-Lipopolysaccharide Complex in Various Ad-  
juvants. P. H. ELZER,\* R. H. JACOBSON, and A. J.  
WINTER. Cornell Univ., Ithaca, N.Y.

WEDNESDAY

- E36.** Characterization of the Protective Antibody Response to *Francisella tularensis* LVS in Mice. T. R. RHINEHART,\* A. H. FORTIER, and K. L. ELKINS. Walter Reed Army Inst. of Res., Rockville, Md.
- E37.** Characterization of the Local Antibody Response following *Shigella* Infection or Vaccination Using the Guinea Pig Keratoconjunctivitis Model. A. HARTMAN,\* L. VAN DE VERG, H. COLLINS, C. POWELL, N. BENDIUK, C. MALLET, and T. L. HALE. Walter Reed Army Inst. of Res., Washington, D.C.
- E38.** Rheumatoid Factor-Like Immunoglobulin M in *Plasmodium berghei* Infections of BALB/C Mice. R. R. HOOK,\* M. K. STUART, and T. J. GREEN. Univ. of Missouri, Columbia, and Kirksville Col. of Osteopathic Med., Kirksville, Mo.

3:30

- E39.** Effects of Dermal Exposure to Benzo[a]pyrene on Humoral Immune Response Parameters. S. A. MARTIN,\* B. A. FLEMING, P. T. BAILEY, and C. A. SCHREINER. Environmental and Health Sci. Lab., Mobil Oil Corp., Princeton, N.J.
- E40.** Tick-Infected Hamsters Fail To Produce Early Antibody to the Outer Surface Proteins of *Borrelia burgdorferi*. J. ROEHRIG, J. PIESMAN, A. HUNT, M. KEEN,\* C. HAPP, and B. JOHNSON. Div. of Vector-Borne Infectious Diseases, Nat. Ctr. for Infectious Diseases, CDC, Fort Collins, Colo.

**Session 59 (N). Seminar**  
(Eligible for continuing education credit)

**ASPECTS OF DRINKING WATER MICROBIAL ECOLOGY**

Wednesday, 1:30 P.M., Room 80

*Convenors:* ROY M. VENTULLO, Univ. of Dayton, Dayton, Ohio, and TIM FORD, Harvard Univ., Cambridge, Mass.

Measurement of Biodegradable Organic Carbon in Drinking Water  
LOUIS A. KAPLAN and THOMAS L. BOTT, Stroud Water Res. Lab., Avondale, Pa.

New Methods for Detection of Viruses and Protozoa in Drinking Water  
JOAN B. ROSE, Univ. of South Florida, Tampa

Reliability of Water Potability Assessment Methods: Past, Present, and Future  
BARRY PYLE and GORDON MCFETERS, Montana State Univ., Bozeman

Water System Biofilms  
DONALD J. REASONER, U.S. EPA, Cincinnati, Ohio

**Session 60 (Q). Seminar**  
(Eligible for continuing education credit)

**ASSESSING THE USE OF NONINDIGENOUS MICROORGANISMS IN BIOREMEDIATION II**

Wednesday, 1:30 P.M., Room 19

*Convenors:* MICHAEL V. WALTER, Texaco Inc., Beacon, N.Y., and JAMES G. MUELLER, SBP Inc. Atlanta, Ga.

Degradation of Vapor Phase Trichloroethylene  
BURT ENSLEY, Envirogen, Princeton, N.J.

Bioreactor Technology for the Degradation of Creosote and Pentachlorophenol: Pilot-Scale Demonstration under the U.S. EPA Site Demonstration Program

JAMES G. MUELLER, SUZANNE E. LANTZ, ELLIS L. KLINE, DEREK ROSS, RICHARD COLVIN, SCOTT BECKMANN, KIM L. KREITON, and P. H. PRITCHARD, SBP Technologies, Inc., Atlanta, Ga.; ERM Group, Exton, Pa.; SAIC, Paramus, N.J.; U.S. EPA R. REL. Cincinnati, Ohio; and U.S. EPA, Gulf Breeze, Fla.

Aerobic Polychlorinated Biphenyls Biodegradation Field Test in the Hudson River

DANIEL A. ABRAMOWICZ, GE Res. & Development Ctr., Schenectady, N.Y.

Degradation of Polychlorinated Biphenyls on Soil by Genetically Engineered Bacteria

FRANK MONDELLO, GE Res. & Development Ctr., Schenectady, N.Y.

Constitutive Degradation of Trichloroethylene in Removable Bioactive Cassettes and Trickling Biofilters

M. SHIELDS, R. SCHAUBHAUTS, M. REAGIN, B. HUGHES, J. CHERRY, and D. LANG, Univ. of West Florida, Tech. Resources Inc., and Univ. of Waterloo, SBP Tech., Gulf Breeze, Fla.

**Session 61 (L)**

**PROBLEMATIC NOSOCOMIAL INFECTIONS: EPIDEMIOLOGY AND CONTROL**

Wednesday, 1:30 P.M., Room 33

*Moderators:* BRYAN SIMMONS, Methodist Hosp. of Memphis, Memphis, Tenn., and C. GLEN MAYHALL, Univ. of Tennessee Sch. of Med., Memphis

1:30 Divisional Lecture  
(Eligible for continuing education credit)

Diagnosing Pneumonia: Quantitative Cultures and Newer Techniques  
C. GLEN MAYHALL, Univ. of Tennessee, Memphis

2:30

L1. Emergence of Multi-Drug-Resistant *Mycobacterium tuberculosis* Isolated from Human Immunodeficiency Virus-Infected Patients. Y. A. LUE,\* T. I. MCLEAN, D. HEWLETT, JR.,

D. HORN, B. JONES, and N. GARCIA. Lincoln Med. and Mental Health Ctr., New York Med. Col., Bronx, N.Y.

- L2. Multi-Drug-Resistant *Mycobacterium tuberculosis* Infections among Patients in a New York City Hospital. M. PEARSON,\* J. JEREB, T. FRIEDEN, M. GORDON, J. KILBURN, J. CRAWFORD, J. BOYLE, S. DOOLEY, R. GOOD, and W. JARVIS. CDC, Atlanta, Ga., and Cabrini Med Ctr., New York, N.Y.
- L3. Incidence and Description of Mupirocin- and Methicillin-Resistant *Staphylococcus aureus*. D. R. REAGAN,\* B. W. FRANZUS, T. LUCAS, and F. A. SARUBBI. Mountain Home VA Med. Ctr. and Quillen Col. of Med., Johnson City, Tenn.
- L4. Mupirocin Resistance among Consecutive Isolates of Methicillin-Resistant *Staphylococcus aureus*. M. C. LAYTON,\* P. FARREL, W. J. HIERHOLZER, JR., and J. E. PATTERSON. Yale Univ. Sch. of Med., New Haven, Conn.

3:30

- L5. Characterization of *Staphylococcus* spp. Strains Using Arbitrarily Primed Polymerase Chain Reaction. S. TELECCO, G. DAMIANI, S. COMINCINI, C. BANDI, and P. MARONE.\* I.R.C.C.S. San Matteo, Univ. of Pavia, Pavia, Italy, and I.D.V.G.A.-C.N.R., Milan, Italy.
- L6. Reproducibility of Plasmid Analysis of Methicillin-Resistant *Staphylococcus epidermidis* from Hospital Personnel. T. J. GRIESHOP,\* L. M. ATKINS, and J. F. JOHN. VA Med. Ctr., Med. Univ. of South Carolina, Charleston.
- L7. Gram-Negative Bacteremia following Open-Heart Surgery. J. RUDNICK,\* C. BECK-SAGUE, R. ANDERSON, B. SCHABLE, and W. JARVIS. CDC, Atlanta, Ga.
- L8. Demonstration of the Efficacy of UV Light Irradiation of Potable Water for Prevention of *Legionella* Colonization of Hospital Water Fixtures. Z. LIU,\* J. E. STOUT, L. TEDESCO, M. BOLDIN, C. C. HWANG, and V. L. YU. VA Med. Ctr., Pittsburgh, Pa.

4:30

- L9. Host-Related Risk Factors for Invasive Filamentous Fungal Infection. D. BURWEN,\* E. DURRY, N. RAO, A. PADHYE, and W. JARVIS. CDC, Atlanta, Ga., and Shadyside Hosp., Pittsburgh, Pa.
- L10. Efficacy of Clindamycin Mouthwash in Suppressing Oropharyngeal Flora: Implications for Surgical Antibiotic Prophylaxis. R. M. VICKERS,\* J. D. RIHS, J. RUBIN-GRANDIS, J. T. JOHNSON, and V. L. YU. VA Med. Ctr. and Univ. of Pittsburgh, Pittsburgh, Pa.

**Session 62 (Committee on International Activities in Microbiology, PSAB; AAM).  
Round Table**

*(Eligible for continuing education credit)*

**MICROBIOLOGY: FOOD AND WATER  
QUALITY CONCERNS IN DEVELOPING  
COUNTRIES**

Wednesday, 1:30 P.M., Room 95

*Convenors:* RITA COLWELL, Univ. of Maryland, College Park; MOSELIO SCHAECHTER, Tufts Univ. Sch. of Med., Bos-

ton, Mass.; and DAVID PRAMER, Rutgers Univ., Piscataway, N.J.

Conservation of human health and development, particularly in the developing countries, requires regular monitoring and assessment of the quality of available food and water resources. Water and food, absolute necessities for life, are also vectors of disease and significant factors in endemic and epidemic scourges. Readily available, safe, and reliable food and water supplies make possible a hygienic environment that is conducive to human resources development. As will be discussed by representatives of the Microbial Recourses Centres (MIRCENs), quality management practices and constant monitoring of the use of microbiological standards constitute effective tools in conserving public health and the human environment.

*Participants:* M. N. MAGDOUB, TIBO DEAK, R. COLWELL, P. ATTHASAMPUNNA, JEAN-CLAUDE PANISSE, DAVID PRAMER, B. ORUKO, and M. SCHAECHTER

**Session 63 (Q)**

**MOLECULAR PROBES IN MICROBIAL  
ECOLOGY**

Wednesday, 1:30 P.M., Room 97

*Moderators:* DAVID A. STAHL, Univ. of Illinois, Urbana, and MICHAEL P. SHIARIS, Univ. of Massachusetts, Boston

1:30 Divisional Lecture

*(Eligib. for continuing education credit)*

Microbial Ecology and the Direct Identification of Microorganisms in Natural Habitats: an Historical Perspective  
NORBERTO J. PALLERONI, NYU Med. Ctr., New York, N.Y.

2:30

- Q60. Quantitative Aspects of Using rRNA-Targeted Hybridization Probes for Studies in Microbial Ecology. M. D. KANE, L. RASKIN,\* and D. A. STAHL. Univ. of Illinois, Urbana.
- Q61. Use of an Oligonucleotide Hybridization Probe Designed from Environmentally Derived 16S rRNA Sequences To Monitor Enrichment and Isolation of Sulfate-Reducing Bacteria. L. K. POULSEN, M. D. KANE,\* and D. A. STAHL. Univ. of Illinois, Urbana.
- Q62. Identification of Aromatic Hydrocarbon-Degrading Bacteria from Wastewater Treatment Facilities Using 16S rDNA Gene Sequence Analysis. R. A. HAUGLAND,\* A. F. ROPE, R. L. CONVERSE, P. R. SFERRA, and J. C. LOPER. Univ. of Cincinnati and U.S. EPA, Cincinnati, Ohio.
- Q63. Comparative Genetic Analysis of Phenanthrene-Degrading Bacteria and Their Response to Phthalate or Salicylate Induction. C. A. MCSORLEY and O. A. OGUNSEITAN.\* Univ. of California, Irvine.

3:30

- Q64. Application of Bioluminescent Reporter Technology as a Tool To Investigate the Involvement of the NAH System in the Catabolism of Different Polyaromatic Hydrocarbons. B. APPLGATE,\* J. MCPHERSON, F. MENN, and A. HEIT-



ZER. Dept. of Microbiol., Ctr. for Environmental Biotechnology, Univ. of Tennessee, Knoxville.

- Q65.** Differentiation and Grouping of Phenanthrene-Degrading Bacteria by DNA-DNA Hybridization with Multiple DNA Probes. Y. YANG,\* M. WALSH, and M. SHIARIS. Univ. of Massachusetts, Boston.
- Q66.** Preliminary Characterization of the Naphthalene Catabolic Pathway of *Pseudomonas* sp. Strain JS1. L. CALLICOTTE,\* J. SANSEVERINO, B. APPLGATE, and F. MENN. Ctr. for Environmental Biotechnology, Univ. of Tennessee, Knoxville.
- Q67.** Quantitation of Catabolic mRNA as a Measure of Biodegradation in Contaminated Soils. J. T. FLEMING\* and G. S. SAYLER. Ctr. for Environmental Biotechnology, Univ. of Tennessee, Knoxville.

### Session 64 (O). Seminar

(Eligible for continuing education credit)

## INDUSTRIAL-SCALE MICROBIAL AND ENZYMATIC PRODUCTION OF SPECIALTY CHEMICALS

(Dedicated to the Memory of Robert W. Detroy)

Wednesday, 1:30 P.M., Room 82

Convenors: EDWARD J. ST. MARTIN and HAYA ZEMEL, Allied-Signal, Des Plaines, Ill.

Enzyme-Catalyzed Production of Phenolic Resins  
ALEXANDER R. POKORA, Mead Res., Chillicothe, Ohio

Enzymatic Processes for the Production of Acrylamide  
TORU NAGASAWA, Nagoya Univ., Iikusa Nagoya, Japan

Enzymatic Production of Glyoxylic Acid  
DAVID ANTON and ROBERT DICOSIMO, DuPont, Wilmington, Del.

Enzymatic Acylation/Resolution of a Key Intermediate in the Synthesis of Loracarbef, a New  $\beta$ -Lactam Antibiotic  
MILTON J. ZMIJEWSKI, JR., and JEFFREY LEVY, Lilly, Indianapolis, Ind.

Production of Novel Chemicals Using Industrial-Scale Biocatalysis  
CHRIS EVANS, RAY MCCAGUE, and RICHARD WISDOM, Enzymatix, Cambridge, England

### Session 65 (P). Round Table

(Eligible for continuing education credit)

## HOW MUCH *LISTERIA MONOCYTOGENES* IS TOO MUCH?

Wednesday, 1:30 P.M., Room 87

Convenors: PEGGY M. FOEGEDING, North Carolina State Univ., Raleigh, and J. STAN BAILEY, Russell Res. Ctr., Athens, Ga.

It is proving to be difficult to prevent the occasional occurrence of *Listeria monocytogenes* in our food supply. This difficulty is due in part to the reasonably widespread presence of this organism in nature and raw foods, the moderate resistance of the cells to commonly used methods to reduce or prevent growth of food-borne microorganisms, and the ability of the organism to grow at refrigeration temperatures. The infective dose of this pathogen is not known but certainly differs significantly for different segments of the population. This round table will address varying viewpoints on the requirements for providing safe foods with respect to *L. monocytogenes*. Participants will present their personal or institutional perspective concerning to what extent *L. monocytogenes* can be tolerated in our food supply and whether or not all foods should be subject to the same regulations intended to prevent human illness due to food-borne *L. monocytogenes*. Panelists include representatives from industry and industrial associations, U.S. regulatory agencies, the Canadian government, Europe, and academia.

Participants: D. BERNARD, J. CAROSELLA, L. COX, J. FARBER, J. M. JAY, J. KVENBERG, and J. MARSDEN

## POSTER SESSIONS

Wednesday, 1:30-3:00 P.M., Exhibit Hall C

(Board numbers in parentheses)

### Session 66 (C). BACTEREMIA AND FUNGEMIA I

- C53.** Detection of Bacterial Growth by Gas Absorption. (001) J. R. WATERS. Abo, Inc., Tampa, Fla.
- C54.** Clinical Comparison of an Automated Pediatric Blood Culture System (BacT/Alert) to Lysis Direct Plating (Isolator). (003) D. A. PICKETT\* and D. F. WELCH. Children's Hosp. of Oklahoma and Univ. of Oklahoma Health Sci. Ctr., Oklahoma City.
- C55.** Comparison of the BacT/Alert with the Signal Oxoid Blood Culture System. (005) R. AUCKENTHALER,\* B. PEPEY, and P. ROHNER. Univ. Hosp. of Geneva, Geneva, Switzerland.
- C56.** Comparison of the Pedi-BacT and BD Vacutainer (18 ml) Aerobic Blood Culture Systems. (007) K. KRISHER\* and D. R. WHYBURN. Children's Med. Ctr. of Dallas and Univ. of Texas Southwest Med. Ctr., Dallas.
- C57.** 5-Day versus 7-Day Protocol for Blood Cultures Using the BacT/Alert Blood Culture Instrument in a University Medical Center. (009) L. M. MANN,\* T. QUON, and D. A. BRUCKNER. UCLA Med. Ctr., Los Angeles, Calif.
- C58.** Clinical Evaluation of the BacT/Alert Using Pedi-BacT Bottles. (011) R. JOYNER, B. PECK, K. SWEAT, D. BRINGLE, and F. BARRETT\* LeBonheur Children's Med. Ctr., Memphis, Tenn.
- C59.** Recovery and Detection of Clinically Important Microorganisms with the BacT/Alert Pediatric Culture Bottle. (013) K. A. READ, D. H. BRYANT,\* S. B. WILKINS, and T. C. THORPE. Organon Teknika Corp., Durham, N.C.
- C60.** Comparison of BacT/Alert with BACTEC 460 for Time to Detection of a Wide Variety of Microorganisms at Very Low Concentrations in Blood. (015) A. E. CASIANO-COLON,\* B. B. HULBERT, P. C. MIGNEAULT, and D. J. HARDY. Univ. of Rochester Med. Ctr., Rochester, N.Y.
- C61.** BacT/Alert Blood Cultures in Clinical Practice. One Institution's Experience. (017) D. J. HARDY,\* B. B. HULBERT, P. C. MIGNEAULT, and M. A. MENEGUS. Univ. of Rochester Med. Ctr., Rochester, N.Y.

## Session 67 (V). SERODETECTION OF BACTERIAL, PARASITIC, AND MISCELLANEOUS ANTIGENS

- C62.** BACTEC NR 660: a 5-Year Review of Positive Blood Cultures Using 5-Day versus 7-Day Protocol. (019) K. HANSON, J. ANDERSON, and R. KLICKER.\* Hennepin County Med. Ctr., Minneapolis, Minn.
- C63.** Detecting Endocarditis with the BACTEC NR-660: Lack of Clinical Importance of Additional Testing after 5 Days. (021) L. DIEM,\* R. HAJJEH, and J. E. MCGOWAN, JR. Grady Mem. Hosp. and Emory Univ. Sch. of Med., Atlanta, Ga.
- C64.** Multicenter Evaluation of a Continuous Monitoring Blood Culture System Utilizing Fluorescent Sensor Technology (BACTEC 9240). (023) F. NOLTE,\* F. KOCKA, R. JERRIS, J. MORELLO, and L. SCHWABE. Emory Univ. Hospital, Atlanta, Ga.; Cook County Hosp., Chicago, Ill.; DeKalb Med. Ctr., Atlanta, Ga.; Univ. of Chicago Hosp., Chicago, Ill.; and Evanston Hosp., Evanston, Ill.
- C65.** Optimization of Growth Values for BACTEC NR660. (025) R. SAUCEDO\* and T. MERLIN. VA Med. Ctr., Albuquerque, N. Mex.
- C66.** Evaluation of the NR-860 Blood Culture System. (027) M. J. FERRARO,\* P. MURTAGH, J. BRAIDT, C. STRATTON, H. RATNER, P. SCHRECKENBERGER, K. RISTOW, B. LEWIS, J. SNYDER, S. LUDE, K. EISENACH, M. J. LEWNO, T. WAKEFIELD, N. ANTIK, B. FILBURN, and M. YOCUM. Massachusetts Gen. Hosp., Boston; Vanderbilt Univ. Med. Ctr., Nashville, Tenn.; Univ. of Illinois Hosp., Chicago; Humana Hosp./Univ., Louisville, Ky.; Arkansas Children's Hosp., Little Rock; and Johns Hopkins Hosp., Baltimore, Md.
- C67.** Comparison of the BACTEC 660 and BACTEC 860 Blood Culture Systems for Detection of Microorganisms in Seeded Cultures. (029) L. HARDY\* and S. BEATY. BDDIS, Res. and Development, Sparks, Md.
- C68.** Assessment of BACTEC 460 Resin Blood Culture Bottles Used in Conjunction with the BacT/Alert Blood Culture System. (031) C. CLAYTON,\* J. REID, S. WILLIAMSON, C. POTTER, B. MOORE, C. CHAMBERS, and P. DANIEL. Presbyterian Hosp., Dallas, Tex.
- C69.** Clinical Evaluation of BACTEC NR6A, 26 Plus, and Lytic Blood Culture Media. (033) P. WILSON\* and R. R. CUTLER. Newham District Microbiol. Labs., St. Andrews Hosp., London, England.
- C70.** Evaluation of a New Automated System: BACTEC NR 860 for Bacterial Detection in Blood Cultures or Biological Fluids. (035) J. CROIZE\* and P. LE NOC. Univ. Hosp., Grenoble, France.
- C71.** Comparison of Difco Continuous Monitoring Blood Culture Instrument (ESP) with BACTEC-660 Using Bottles Seeded with Clinical Isolates. (037) V. SATISHCHANDRAN,\* E. RUDOLPH, and A. L. TRUANT. Temple Univ. Hosp. and Sch. of Med., Philadelphia, Pa.
- C72.** Development of a New Automated Blood Culture System. (039) N. M. SULLIVAN,\* L. K. TUCK, G. S. WELTY, and R. FIRSTENBERG-EDEN. Difco Lab., Res. and Development, Ann Arbor, Mich.
- C73.** Bacteremia Detection by the Difco ESP 128 Blood Culture System. (041) J. A. MORELLO,\* C. LEITCH, S. NITZ, J. W. DYKE, M. ANDRUSZEWSKI, G. MAIER, W. LANDAU, and M. BEARD. Univ. of Chicago Med. Ctr., Chicago, Ill.; Sparrow Hosp., Lansing, Mich.; and Rush-Presbyterian-St. Luke's Med. Ctr., Chicago, Ill.
- C74.** Evaluation of a New Automated Blood Culture System. (043) N. SULLIVAN,\* L. TUCK, G. WELTY, and R. FIRSTENBERG-EDEN. Difco Lab., Res. and Development Ctr., Ann Arbor, Mich.
- V1.** Novel Method for Specific Detection of *Borrelia burgdorferi* by Utilizing the 5' → 3' Exonuclease Activity of *Thermus aquaticus* DNA Polymerase in a Polymerase Chain Reaction Assay. (045) P. M. HOLLAND,\* R. WATSON, R. D. ABRAMSON, and D. H. GELFAND. PCR Div., Cetus Corp., Emeryville, Calif.
- V2.** Comparison of Eight Commercial Kits for Detection of Antibodies to *Borrelia burgdorferi*. (047) J. L. SCHMITZ,\* C. POWELL, and J. D. FOLDS. Univ. of North Carolina Hosp., Chapel Hill.
- V3.** Culture Positivity and Serologic Responses of Patients with Early Lyme Disease. (049) C. PAVIA,\* S. BITTKER, and D. COOPER. New York Med. Col., Valhalla, and NYCOM, Old Westbury, N.Y.
- V4.** Antibodies to *Borrelia burgdorferi* in Sera of Patients with Spirochete-Associated Oral Disease: Reactivities with 41-kDa (Flagellar) and 66-kDa Antigens. (051) D. C. MALLOY, K. K. NAUMAN,\* and R. K. NAUMAN. Maryland Med. Lab., Inc., and Univ. of Maryland Dent. Sch., Baltimore.
- V5.** Presence of Major Immunoglobulin G (IgG) and IgM Reactive *Borrelia burgdorferi*-Associated Western Blot Bands in Sera from Normal, Non-Lyme-Disease, and Clinically Characterized Lyme Patients. (053) W. CHEN, C. DUBRUELE, J. GOURLEY, M. PICKETT,\* R. PORAMBO, and S. ALEXANDER. Cambridge Biotech, Worcester, Mass.
- V6.** An Automated Latex Particle Spectrophotometric Assay for Detection of *Chlamydia trachomatis* Antigen from Endocervical Swabs. (055) M. STOBAGH, J. WILSON, and S. ANAOKAR.\* Seradyn Inc., Indianapolis, Ind.
- V7.** Significance of Specific Antibodies in *Chlamydia trachomatis* Infection. (057) C. CHAPLAIN, M. HARZIC, L. TRAGIN, and J. C. GHNASSIA.\* Service de Microbiol. Ctr. Hosp., Versailles, France.
- V8.** Colorimetric Detection of In Vitro Amplified *Chlamydia trachomatis* in Urogenital Clinical Samples using Immunomagnetic Separations. (059) A. HEDRUM,\* J. LUNDEBERG, H. NEUJHR, and M. UHLEN. Royal Inst. of Technology, Stockholm, Sweden.
- V9.** Poor Predictive Value of Indirect Immunoperoxidase Assay for Serum Detection of Immunoglobulin A (IgA) and IgM Antibodies in *Chlamydia trachomatis* Urethritis. (061) R. SERRA,\* D. CIRILLO, V. GHISSETTI, G. MARCHIARO, and E. GAIDO. Cl. Microbiol. Dept., Molinette Hosp., Turin, Italy.
- V10.** Evaluation of Direct Immunofluorescence as a Complementary Test for the Diagnosis of *Chlamydia trachomatis* by Enzyme Immunoassay. (063) P. BAYARDELLE\* and E. SETTECASI. Hôpital Honoré Mercier, Saint-Hyacinthe, and Hôpital Notre-Dame, Univ. de Montréal, Montreal, Quebec, Canada.
- V11.** Evaluation of Rapid Automated Enzyme-Linked Immunosorbent Assay To Detect Antibodies to *Toxoplasma*. (065) J. MILLER\* and R. A. VENEZIA. Albany Med. Ctr., Albany, N.Y.
- V12.** Evaluation of a Rapid Immunodot Assay for *Bordetella pertussis* Cultures. (067) P. K. CASSIDAY,\* G. N. SANDEN, and J. M. BARBAREE. CDC, Atlanta, Ga.
- V13.** Immunoglobulin A (IgA) and IgG Subclass Responses to the Lipooligosaccharide of *Bordetella pertussis* in Serum Samples from Pertussis Patients and Controls. (069) G. N. SANDEN\* and P. K. CASSIDAY. CDC, Atlanta, Ga.
- V14.** Comparison of Two Agglutination Assays and a Radioimmunoassay for the Detection of Anti-Thyroglobulin and Anti-Thyroid Peroxidase Antibodies. (071) M. M. TAMASHIRO.\*

E. AU, and D. Y. WONG. UCLA Med. Ctr., Los Angeles, Calif.

V15. Rapid Detection of Human Interleukin-6. (073) J. KIM,\* N. GOLDSTEIN, R. SONGSAKPHISARN, S. SKELLY, C. TACKNEY, and R. KISSINGER. ImClone Systems Inc., New York, N.Y.

V16. Characterization of Recombinant Immubind G1: the Product of a Synthetic Gene Encoding a Monovalent Immunoglobulin G Fc-Binding Protein. (075) W. TRUMBLE\* and M. HUANG. Dept. of Bacteriol. and Biochemistry, Univ. of Idaho, Moscow.

V17. Enzyme-Linked Immunoassay for the Quantitation of Antibodies to Pneumococcal Capsular Polysaccharides. (077) K. M. RUDOLPH\* and A. J. PARKINSON. Arctic Investigation Program, Nat. Ctr. for Infectious Disease, CDC, Anchorage, Alaska.

V18. Clinical Significance of a Commercial Enzyme Immunoassay System (HM-CAP from EPI) for Anti-*Helicobacter pylori* Immunoglobulin G Detection. (079) J. S. PEACOCK,\* A. BELENKY, P. LIU, J. BOND-GREEN, F. ZAMANIYAN, and L. CIOTA. Enteric Products Inc., Stony Brook Univ., Stony Brook, N.Y.

V19. Serological Significance of Immunoglobulin A Antibody to HM-CAP Antigen of *Helicobacter pylori*. (081) A. BELENKY,\* J. S. PEACOCK, F. ZAMANIYAN, J. BOND-GREEN, P. LIU, and L. CIOTA. Enteric Products Inc., Stony Brook Univ. Stony Brook, N.Y.

V20. Production of Purified Polyclonal Antibodies for Immunoassay of *Podophyllum* Lignans. (083) K. YOO\* and J. R. PORTER. Philadelphia Col. of Pharmacy and Sci., Philadelphia, Pa.

V21. Comparison of Solid Phase Substrate for Immunoblotting with Traditional Alkaline Phosphatase and Horseradish Peroxidase Methods. (085) F. PACHECO,\* J. PORTNOY, B. UPADRASHTA, S. LANDUYT, and C. BARNES. Children's Mercy Hosp. and Univ. of Missouri, Kansas City.

V22. Two-Dimensional Electrophoresis of *Alternaria alternata*. (087) C. BARNES,\* J. PORTNOY, B. UPADRASHTA, and F. PACHECO. Children's Mercy Hosp. and Univ. of Missouri, Kansas City.

V23. Tetrahydrocannabinol-Mediated Inhibition of Macrophage Metabolic Activity Is Antagonized by Serum and Cell Proteins. (089) J.-L. TANG\* and G. LANCZ. Univ. of South Florida, Tampa.

V24. Inhibition Enzyme Immunoassay for Human Antibody to *Haemophilus ducreyi*: Antigenicity of Lipooligosaccharide and Effect of Human Immunodeficiency Virus on Relative Antibody Affinity. (091) M. DESJARDINS,\* L. G. FILION, and D. W. CAMERON. Univ. of Ottawa, Ottawa, Ontario, Canada.

V25. Rapid, Simplified Method for Preparation of Latex Agglutination Reagents for Detection of Capsular Antigens. (093) T. INZANA. Col. of Vet. Med., Virginia Polytechnic Inst., Blacksburg.

V26. The Production of Murine Monoclonal Antibodies by Using a Hollow Fiber Membrane. (095) K. CHAPUT,\* S. BOND, and S. DOWNING. Amicon Div., W. R. Grace & Co.-Conn., Beverly, Mass.

V27. Isolation of Immunoglobulin A (IgA) from Human Serum by Using an Immobilized Bacterial IgA-Fc Binding Protein. (097) E. L. FAULMANN\* and M. D. P. BOYLE. Med. Col. of Ohio, Toledo.

## Session 68 (G). MOLLICUTES AND DISEASE: ETIOLOGY, DIAGNOSIS, AND ANTIMICROBIAL SUSCEPTIBILITY

G1. Comparison of Urogenital Mycoplasmas Found in the Urine of AIDS and Non-AIDS Individuals. (099) M. M. HAYES,\* M. S. DAWSON, R. WANG, P. PIERCE, J. SHIH, and S.-C. LO. ARP, AFIP, Washington, D.C.; Clin. Ctr., NIH, Bethesda, Md., and Georgetown Univ. Hosp., Washington, D.C.

G2. Antigenic and DNA Analyses of Different Clinical Isolates of *Mycoplasma penetrans*, a New Species of Mycoplasma from Patients with AIDS. (101) R. Y.-H. WANG,\* M. HAYES, H. KOTANI, P. NEWTON III, J. SHIH, and S.-C. LO. ARP, Armed Forces Inst. of Pathol., Washington, D.C., and Clin. Ctr., NIH, Bethesda, Md.

G3. Recovery of Mycoplasma in Respiratory Cultures from Human Immunodeficiency Virus-Positive and -Negative Patients: Effect of Isolation Medium. (103) N. ANTIK,\* T. WAKEFIELD, J. DEBIASE, B. BRITTON, J. TULLY, D. ROSE, D. OLDACH, L. MUNDY, P. AUWAERTER, A. BURTON, and P. CHARACHE. Johns Hopkins Med. Inst., Baltimore, Md., and Nat. Inst. of Allergy and Infectious Diseases, Frederick, Md.

G4. Prevalence of *Ureaplasma urealyticum* in Urines Collected by Catheterization from Men following Spinal Cord Injury. (105) K. B. WAITES\* and K. C. CANUPP. Univ. of Alabama, Birmingham.

G5. Investigation of Pathogenicity of *Ureaplasma urealyticum* in Placental Membranes and Amniotic Fluids. (107) L. BLYTHE,\* R. HANKERD, and C. L. PIERSON. Univ. of Michigan Hosp., Ann Arbor.

G6. *Ureaplasma urealyticum* and Histology in 44 Cases of Spontaneous Abortion. (109) R. B. KUNDSIN,\* N. JOSTE, and D. GENEST. Brigham and Women's Hosp., Harvard Med. Sch., Boston, Mass.

G7. Isolation of *Mycoplasma pneumoniae* from Mexican Children during an Outbreak of Measles. (111) L. CEDILLO,\* S. JIMENEZ, H. GARCIA, M. NAVA, C. GIL, and D. CORONA. Univ. Autónoma de Puebla, Puebla, Puebla, Mexico.

G8. Antimycoplasmal Activity of Nucleoside Analogs. (113) B. DE BARBEYRAC,\* W. USSEL, A. CHARRON, L. LITVAK, S. LITVAK, J. M. BOVE, and C. BEBEAR. Univ. Bordeaux 2, IBCN-CNRS, INRA, Bordeaux, France

G9. In Vitro Susceptibility of *Ureaplasma urealyticum* and *Mycoplasma hominis* to Five Antibiotics. (115) J. SMAYEV-SKY,\* A. LANZA, M. PUNDIK, H. BIANCHINI, G. WELTMAN, S. RELLOSO, and C. BANTAR. Lab. Biocencia and Ctr. de Educación Méd. e Investigaciones Clínicas, Buenos Aires, Argentina.

G10. Comparison of Biochemical, Physiological, and Susceptibility Tests of "L" Forms and Parent Bacteria of Gram-Negative Rods. (117) G. MAYAGOITIA,\* C. GIL, G. RAMIREZ, C. LOPEZ, and L. CEDILLO. Univ. Autónoma de Puebla, Puebla, Puebla, Mexico.

G11. Construction of Monoclonal Antibodies for Detection of Mycoplasma Infection and Contamination. (119) M. H. FORSYTH,\* J. A. RYAN, V. SASSEVILLE, and S. J. GEARY. Univ. of Connecticut, Storrs.

G12. Mycoplasma Detection by DNA Fluorochrome Staining. Method for Reducing Fluorescence Fading. (121) M. BATTAGLIA,\* P. BERTOCCHI, G. W. READ, and T. PARASASSI. CNR Inst. for Exp. Med., Rome, Italy.

## Session 69 (D). PHYSIOLOGY AND STRUCTURE OF PATHOGENIC BACTERIA

- D23.** Adaptive Acid Tolerance Response in *Aeromonas hydrophila*. (123) K. L. KAREM, J. W. FOSTER, and A. K. BEJ.\* Dept. of Microbiol. and Immunology, Univ. of South Alabama, Mobile, and Dept. of Biol., Univ. of Alabama, Birmingham.
- D24.** Polymerase Chain Reaction Amplification and Molecular Cloning of a Segment of the Cytoplasmic Filament Protein (Cfp) Gene of *Treponema pallidum*. (125) S. H. ELMORE,\* E. M. WALKER, and S. J. NORRIS. Univ. of Texas Med. Sch., Houston.
- D25.** Hemolytic Activity of *Borrelia burgdorferi*. (127) L. R. WILLIAMS\* and F. E. AUSTIN. Univ. of Louisville Sch. of Med., Louisville, Ky.
- D26.** Genes for Carbohydrate Metabolism from *Brucella abortus*. (129) R. C. ESSENBERG. Oklahoma State Univ., Stillwater.
- D27.** Characterization of a Recombinant 66-kDa *Brucella abortus* Immunoreactive Protein. (131) R. M. ROOP II,\* T. W. FLETCHER, M. L. PRICE, B. E. DUNN, S. M. BOYLE, N. SRIRANGANATHAN, and G. G. SCHURIG. Dept. of Microbiol. and Immunology and Dept. of Pathology, Univ. of Arkansas for Med. Sci., Little Rock, and Dept. of Pathobiology, Virginia-Maryland Regional Col. of Vet. Med., Blacksburg, Va.
- D28.** Method for Release of Periplasmic Protein from *Brucella abortus*. (133) T. J. STABEL,\* Z. G. SHA, and J. E. MAYFIELD. Agricultural Res. Service, USDA, Nat. Animal Disease Ctr., and Dept. of Zoology and Genetics, Iowa State Univ., Ames.
- D29.** Immunological Reactivity of *Brucella abortus* Hsp 60. (135) J. LIN,\* R. SMITH III, L. G. ADAMS, and T. A. FICHT. Texas A&M Univ./Texas Agricultural Exp. Station, College Station.
- D30.** Molecular Analysis of Two *Haemophilus ducreyi* Genes Homologous to the *groE* Heat Shock Operon. (137) L. M. PARSONS,\* A. L. WARING, and M. SHAYEGANI. New York State Dept. of Health, Wadsworth Ctr., and Dept. of Biomed. Sci., SUNY, Albany.
- D31.** Stress-Induced Protein from Group B *Neisseria meningitidis*. (139) G. ARAKERE\* and C. E. FRASCH. Div. of Bacterial Products, Ctr. for Biologics Evaluation and Res., FDA, Bethesda, Md.
- D32.** Are Heat Shock Proteins Involved in Thermotolerance in *Staphylococcus aureus*? (141) M. HRITZ,\* C. A. BORTNER, and M. W. QORONFLEH. Philadelphia Col. of Osteopathic Med., Philadelphia, Pa.
- D33.** Are Heat Shock Proteins Involved in Protection of *Staphylococcus aureus* against Freezing? (143) S. W. LAW,\* C. A. BORTNER, and M. W. QORONFLEH. Philadelphia Col. of Osteopathic Med., Philadelphia, Pa.
- D34.** Cysteine Acquisition of *Legionella pneumophila*. (145) M. T. POCH\* and W. JOHNSON. Univ. of Iowa, Iowa City.
- D35.** Molecular Cloning of Five Tryptophan Genes from *Legionella pneumophila*. (147) C. S. MINTZ\* and C. EDDY. Univ. of Miami Sch. of Med., Miami, Fla., and Mississippi State Univ., Mississippi State.
- D36.** Molecular Cloning and Characterization of a Proline Iminopeptidase from *Neisseria gonorrhoeae*. (149) N. H. ALBERTSON\* and M. KOOMEY. Univ. of Michigan, Ann Arbor.
- D37.** Cloning and Characterization of the S.NgoVIII DNA Methylase of *Neisseria gonorrhoeae*. (151) J. GUNN,\* R. CHIEN, and D. STEIN. Univ. of Maryland, College Park.

- D38.** *Neisseria meningitidis* Codes for an FK506-Inhibitible and a Cyclophilin-Type Rotamase. (153) B. A. SAMPSON\* and E. C. GOTSCHLICH. Rockefeller Univ., New York, N.Y.
- D39.** The Galactose Operon of *Streptococcus mutans*. (155) D. AJDIC,\* R. R. B. RUSSELL, and J. J. FERRETTI. Univ. of Oklahoma Health Sci. Ctr., Oklahoma City, and Univ. of Newcastle upon Tyne, Newcastle, U.K.
- D40.** Characterization of the *Streptococcus mutans* Phosphoenolpyruvate-Dependent Phosphotransferase System Mannitol Enzyme II Gene. (157) A. L. HONEYMAN. Washington Univ., St. Louis, Mo.
- D41.** Cloning and Expression of the Multiple Sugar Metabolism (*msm*) Operon of *Streptococcus mutans* in Heterologous Streptococcal Hosts. (159) L. TAO,\* R. R. B. RUSSELL, and J. J. FERRETTI. Univ. of Oklahoma, Health Sci. Ctr., Oklahoma City, and Univ. of Newcastle upon Tyne, Newcastle upon Tyne, England.
- D42.** Cloning of the Restriction Modification Genes from *Yersinia enterocolitica* 8081. (161) S. A. KINDER,\* E. BRYANT, J. PEPE, and V. L. MILLER. UCLA, Los Angeles, Calif.
- D43.** Characterization of a 25-kDa Plasmid-Encoded Protein of *Yersinia enterocolitica* Using Monoclonal Antibodies which Recognize a Serotype-Specific Epitope. (163) Q. LI, S. BHADURI,\* and W. E. MAGEE. Drexel Univ. and USDA, Agricultural Res. Service, Eastern Regional Res. Ctr., Philadelphia, Pa.

## Session 70 (B). GENETICS OF VIRULENCE OF PATHOGENIC BACTERIA

- B66.** Detection of Genes for EAF and EAE in *Escherichia coli* Isolated from Pigs with Postweaning Diarrhea Using Colony Hybridization. (165) M. BOSSE, J. M. FAIRBROTHER,\* J. HAREL, and C. DESAUTELS. Faculty of Vet. Med., Dept. of Pathology and Microbiol., Montreal Univ., St-Hyacinthe, Quebec, Canada.
- B67.** Genetic Relationships among *eae*-Positive *Escherichia coli* Associated with Diarrhea. (167) T. S. WHITTAM,\* M. L. WOLFE, and P. I. TARR. Dept. of Biology, Pennsylvania State Univ., University Park, and Dept. of Pediatrics, Univ. of Washington Sch. of Med., Seattle.
- B68.** Characterization of an Attachment and Effacement Locus of *Citrobacter freundii* Biotype 4280. (169) D. SCHAUER\* and S. FALKOW. Stanford Univ., Stanford, Calif.
- B69.** Enteroregulative *Escherichia coli* Adherence: Identification of Genetic Loci That Mediate Adherence to Small Bowel Mucin and Epithelial Cells. (171) D. A. WANKE,\* S. CRONAN, and C. I. MILLER. New England Deaconess Hosp., Massachusetts Gen. Hosp., and Harvard Med. Sch., Boston.
- B70.** Dissecting *Escherichia coli* K1 Pathogenesis by Chromosome Replacement with K-12 DNA. (173) C. BLOCH\* and C. RODE. Univ. of Michigan, Ann Arbor.
- B71.** Clonal Structure and Pathogenicity of *Escherichia coli* from Chickens. (175) V. KAPUR\* and R. A. WILSON. Pennsylvania State Univ., University Park.
- B72.** Clonal Relationships and Variation in Virulence among *Escherichia coli* Strains of Avian Origin. (177) D. G. WHITE,\* M. DHOMOLIN, and T. S. WHITTAM. Dept. of Biol., Pennsylvania State Univ., University Park, and Inst. Nat. de la Recherche Agronomique, Centre de Theix, Ceyrat, France.
- B73.** *tol* Genes Are Required for Cloacin DF13 Susceptibility in *Escherichia coli* Expressing the Aerobactin/Cloacin DF13 Receptor IutA. (179) J. A. THOMAS\* and M. A. VALVANO. Dept. of Microbiol. and Immunology, Univ. of Western Ontario, London, Ontario, Canada.

- B74.** Genetic Analysis of Acid Resistance in *Shigella flexneri*: Requirement for a *katF* Homolog. (181) P. L. C. SMALL\* and S. FALKOW. Middlebury Col., Middlebury, Vermont, and Stanford Univ., Stanford, Calif.
- B75.** A Novel Locus for In Vivo Down-Regulation of *Yersinia enterocolitica* Virulence. (183) M. SKURNIK,\* A. AL-HEN-DY, and P. TOIVANEN. Turku Univ., Turku, Finland.
- B76.** Thermoregulation of Virulence Genes of *Yersinia enterocolitica*: DNA Supercoiling, Heat Shock, or Both? (185) J. R. ROHDE, V. KAPATRAL, and S. A. MINNICH.\* Dept. of Bacteriol., Univ. of Idaho, Moscow.
- B77.** Interaction between Virulent *Yersinia* and a Polarized Epithelial Monolayer of MDCK Cells. (187) R. ROSQVIST,\* H. WOLF-WATZ, and K.-E. MAGNUSSON. Nat. Def. Res. Establ., Umea, Sweden; Univ. of Umea, Umea, Sweden; and Univ. of Linköping, Linköping, Sweden.
- B78.** Two Effects of *lcrD* Mutations in *Yersinia pestis*. (189) G. V. PLANO\* and S. C. STRALEY. Univ. of Kentucky, Lexington.
- B79.** Overexpression of Pertactin from *Bordetella pertussis*. (191) S. LOOSMORE,\* R. YACOOB, G. ZEALEY, A. HERBERT, and M. KLEIN. Connaught Ctr. for Biotechnology Res., Toronto, Ontario, Canada.
- B80.** The AlgR Binding Sites within the *algD* Promoter Comprise a Set of Inverted Repeats Separated by 340 bp. (193) C. D. MOHR,\* J. LEVEAU, and N. S. HIBLER. Univ. of Texas Health Sci. Ctr., San Antonio.
- B81.** Transcriptional and Functional Analysis of a Locus Mapping Near *muc* Genes in *Pseudomonas aeruginosa*. (195) D. W. MARTIN\* and V. DERETIC. Univ. of Texas Health Sci. Ctr., San Antonio.
- B82.** *hemCD* and *algR*: Control of Mucoidity in *Pseudomonas aeruginosa*. (197) S. K. SONSTEBY,\* C. D. MOHR, and V. DERETIC. Univ. of Texas Health Sci. Ctr., San Antonio.
- B83.** In Vitro and In Vivo Phosphorylation of AlgR, a Response Regulator Controlling Mucoidity in *Pseudomonas aeruginosa*. (199) J. LEVEAU\* and V. DERETIC. Univ. of Texas Health Sci. Ctr., San Antonio.
- B84.** *Pseudomonas aeruginosa* Population Transcript Accumulation in the Sputum of Patients with Cystic Fibrosis. (201) D. G. STOREY,\* E. E. UJACK, and H. R. RABIN. Univ. of Calgary, Calgary, Alberta, Canada.
- B85.** Multiple Promoter Elements of the PrfA Transcriptional Activator Contribute to *Listeria monocytogenes* Pathogenicity. (203) N. E. FREITAG,\* A. CAMILLI, and D. A. PORTNOY. Univ. of Pennsylvania Sch. of Med., Philadelphia.
- B86.** A Nonmotile Transposon Mutant of *Listeria monocytogenes* with Pleiotropic Effects. (205) S. KATHARIOU and X. OU.\* Univ. of Hawaii, Honolulu.
- B87.** Genetic Characterization of Pleiotropic Mutations of *Listeria monocytogenes* Associated with Deficiencies in Multiple Virulence-Related Factors. (207) V. OSHIRO,\* F. QUINN, and S. KATHARIOU. Univ. of Hawaii, Honolulu, and CDC, Atlanta, Ga.
- B88.** Cloning of a *Legionella pneumophila* Gene That Encodes Congo Red Binding. (209) E. HICKEY\* and N. CIANCIO-TO. Northwestern Univ., Chicago, Ill.
- B89.** Analysis of Virulence-Associated Loci in Nontoxicogenic *Bacillus anthracis*: Construction of DNA Libraries of Plasmid pX02. (211) S. WELKOS,\* N. VIETRI, and L. BAGINSKY. U.S. Army Med. Res. Inst. of Infectious Diseases, Fort Detrick, Frederick, Md.
- B90.** Cloning in *Escherichia coli* of Tn917-Mutagenized Regions of the *Bacillus anthracis* pX02 Plasmid Associated with the Virulence of Nontoxicogenic Strains. (213) N. J. VIETRI\* and S. L. WELKOS. U.S. Army Med. Res. Inst. of Infectious Diseases, Fort Detrick, Frederick, Md.
- B91.** Inducible Bacteriophages of *Actinobacillus actinomycetem-comitans*. (215) A. LOFTUS\* and A. DELISLE. Univ. of Maryland Dent. Sch., Baltimore.
- B92.** Cloning of a *Mycobacterium tuberculosis* Gene Necessary for Invasion of Cultured Epithelial Cells. (217) S. ARRUDA,\* G. BOMFIM, W. D. JOHNSON, JR., and L. W. RILEY. Cornell Univ. Med. Col., New York, N.Y.

## Session 71 (Q). MICROBIAL INTERACTIONS WITH METALS: RESISTANCE, RECOVERY, AND TOXICITY

- Q68.** Microbiological Recovery and Removal of Molybdenum and Nickel from Spent Coal Liquefaction Catalysts. (219) D. O. HITZMAN,\* P. L. SPERL, and G. T. SPERL. Geo-Microbial Technologies, Inc., Ochelata, Okla.
- Q69.** Copper Biosorption by Immobilized Algin Biosorbents. (221) S. L. EASTMAN,\* A. E. TORMA, and V. WINSTON. Idaho Nat. Engineering Lab., EG&G Idaho, Inc., Idaho Falls, and Idaho State Univ., Pocatello.
- Q70.** Removal and Recovery of Cu(II) from Industrial Effluent by Immobilized Cells of *Pseudomonas* Species. (223) P. K. WONG\* and C. M. SO. Dept. of Biol., Chinese Univ. of Hong Kong, Shatin, N.T., Hong Kong.
- Q71.** Effect of Cell Pretreatments on Uranium Binding by *Pseudomonas aeruginosa*. (225) B. D. FAISON,\* J. M. NORMAN, J. R. CONNELLY, and G. W. STRANDBERG. Oak Ridge Nat. Lab., Oak Ridge, Tenn.
- Q72.** Manganese Oxidation by *Pseudomonas putida*. (227) S. R. DEPALMA\* and R. MITCHELL. Harvard Univ., Cambridge, Mass.
- Q73.** Transformation of Pb II to Lead Colloid by *Moraxella bovis*. (229) B. L. SAIZ\* and L. L. BARTON. Dept. of Biol., Univ. of New Mexico, Albuquerque.
- Q74.** Heavy-Metal Resistance Patterns of Soil Fluorescent *Pseudomonas* spp. (231) C. CERVANTES,\* R. AGUILAR, and R. FARIAS. Univ. of Michoacana, Morelia, Mich., Mexico.
- Q75.** Communication of Tributyltin Resistance among Freshwater Sediment Bacteria. (233) C. E. MILLER\* and R. M. PFISTER. Ohio State Univ., Columbus.
- Q76.** Genetic Basis of Increased Hg<sup>2+</sup> Resistance in *Pseudomonas aeruginosa* PU21 (Rip64). (235) O. A. OGUNSEITAN. Univ. of California, Irvine.
- Q77.** Prokaryotic Metallothioneins as Exemplified by Cyanobacterial Metallothionein. (237) M. RHODES,\* S. RHODES, and S. SILVER. Dept. of Microbiol. and Immunology, Univ. of Illinois, Chicago.
- Q78.** Cadmium and Zinc Resistance in a Strain of *Pseudomonas putida*. (239) S. FRACKMAN\* and K. H. NEALSON. Ctr. for Great Lakes Studies, Univ. of Wisconsin, Milwaukee.
- Q79.** Correlation of SO<sub>4</sub><sup>2-</sup> Reduction with Hg<sup>2+</sup> Methylation in Anoxic Aquatic Sediments. (241) S.-C. CHOI\* and R. BARTHA. Rutgers Univ., New Brunswick, N.J.
- Q80.** Effect of Microorganisms on Release of Hazardous Metal Ions from Contaminated Soil. (243) K. W. TSANG,\* R. M. PFISTER, L. A. LOPEZ, and P. R. DUGAN. Idaho Nat. Engineering Lab., EG&G Idaho, Inc., Idaho Falls, and Ohio State Univ.
- Q81.** Analysis of Structural Responses of *Anabaena doliolum* (Cyanophyceae) to Aluminum: Morphometric and X-Ray Microanalysis Study. (245) E. JONES, T. E. JENSEN, and W. A. CORPE.\* Lehman Col. of City Univ. of New York and Columbia Univ., New York, N.Y.
- Q82.** The Toxicological Response of *Synechococcus leopoliensis* (Cyanophyceae) to Cadmium: Morphometric and X-Ray Mi-

croanalysis Study. (247) M. TANG,\* T. E. JENSEN,\* and W. A. CORPE. Lehman Col., City Univ. of New York, and Columbia Univ., New York, N.Y.

**Q83.** Mutation of Glutathione Gene Confers Arsenite and Mercury Sensitivity to *Escherichia coli*. (249) L. M. LATINWO, S. SILVER, and C. DONALD.\* Florida A&M Univ., Tallahassee, and Univ. of Illinois, Chicago.

## Session 72 (H). DNA REPLICATION AND MODIFICATION

**H97.** Chromosome Replication, Cell Division, and Dimensional Rearrangement following a Nutritional Downshift of *Escherichia coli*. (251) A. ZARITSKY\* and C. E. HELMSTETTER. Dept. of Biol. Sci., Florida Inst. of Technol., Melbourne, and Dept. of Life Sci., Ben-Gurion Univ., Be'er-Sheva, Israel.

**H98.** Correct Spacing between the 13-mers and the 9-mers of the *Escherichia coli* Chromosomal Origin Is Essential for the Initiation of DNA Replication In Vitro and In Vivo. (253) J. HSU,\* C. THOMPSON, D. TRUSCA, K. YOUNG, L. SILVER, and D. BRAMHILL. Merck Sharp and Dohme Res. Lab., Rahway, N.J.

**H99.** Analysis of DNA Damage-Inducible Origins of DNA Replication in *Escherichia coli*. (255) T. ASAI\* and T. KOGOMA. Univ. of New Mexico Med. Sch., Albuquerque.

**H100.** New Essential Cell Division Gene Isolated as Dosage-Dependent Suppressor of an *ftsA* Temperature-Sensitive Mutation. (257) K. DAI\* and J. LUTKENHAUS. Univ. of Kansas Med. Ctr., Kansas City.

**H101.** Biochemical Studies on the *Escherichia coli* Cell Division Protein FtsZ. (259) A. MUKHERJEE\* and J. LUTKENHAUS. Univ. of Kansas Med. Ctr., Kansas City.

**H102.** Baby Machine Analysis of DNA Replication-Cell Division Coordination in *Escherichia coli* K-12. (261) C. HELMSTETTER,\* C. EENHUIS, P. THEISEN, J. GRIMWADE, and A. LEONARD. Florida Inst. of Technology, Melbourne.

**H103.** Use of Polymerase Chain Reaction-Coupled In Vitro Transcription/Translation To Study Thermostable Bacterial DNA Polymerases. (263) P. A. LANDRE\* and D. H. GELFAND. PCR Div., Cetus Corp., Emeryville, Calif.

**H104.** The DNA Polymerase I Gene from the Extreme Thermophile *Thermotoga maritima*: Identification, Cloning, and Expression of Full-Length and Truncated Forms in *Escherichia coli*. (265) F. C. LAWYER\* and D. H. GELFAND. PCR Div., Cetus Corp., Emeryville, Calif.

**H105.** Characterization of the Strand Displacement and Nick Translation Activities of *Thermus aquaticus* DNA Polymerase. (267) R. D. ABRAMSON\* and D. H. GELFAND. Cetus Corp., Emeryville, Calif.

**H106.** Investigation of the DNA Sequence Environment Required for Function of the Core Domain of Yeast Chromosomal Replication Origins. (269) J. F. SCOTT,\* J. K. MOULDS, F. SEMES, V. S. WONG, P. K. UYEHARA, J. L. JAVIER, and M. Y. ANDREWS. Univ. of Hawaii, Hilo.

**H107.** Biological Effects of Topoisomerase IV in *Salmonella typhimurium*. (271) D. J. SEKULA\* and M. B. SCHMID. Princeton Univ., Princeton, N.J.

**H108.** Construction of pCAK1 Phage-Plasmid Hybrid (Phasmid) and Its Replication in *Escherichia coli*. (273) A. Y. KIM\* and H. P. BLASCHEK. Univ. of Illinois, Urbana.

**H109.** Evidence for Circular Multimer Plasmid DNA in *recD2202* Mutants of *Escherichia coli*. (275) R. SEELKE\* and T. LAUGHLIN. Univ. of Wisconsin, Superior.

**H110.** Development of a DNA Helicase Activity Gel System. (277) S. K. SHUKLA\* and D. MCCARTHY. Univ. of Oklahoma, Norman.

**H111.** Modulation of McrBC Restriction by a 33-kDa Protein. (279) T. P. BEARY\* and E. C. ACHBERGER. Louisiana State Univ., Baton Rouge.

**H112.** The Recognition Site for McrBC Restriction. (281) H. D. BRAYMER,\* L. ZHENG, and L. A. SIMMONS. Dept. of Microbiol., Louisiana State Univ., and Pennington Biomed. Res. Ctr., Baton Rouge.

**H113.** Isolation of *Vibrio cholerae* Mutants with an Altered Viable but Nonculturable Response. (283) J. RAVEL,\* R. T. HILL, and R. R. COLWELL. Ctr. of Marine Biotechnology, Univ. of Maryland, Baltimore.

## Session 73 (I). ARCHAEBACTERIA I: PHYSIOLOGY AND MOLECULAR BIOLOGY

**I13.** Leucine Pseudoauxotrophy in *Methanococcus voltae*. (285) P. G. SIMPSON,\* G. TRIBBLE, S. SOHN, M. MESBAH, and W. B. WHITMAN. Dept. of Microbiol., Univ. of Georgia, Athens.

**I14.** Novel, Plasmid-Encoded R-M Systems in *Methanobacterium thermoformicicum*. (287) J. NOLLING\* and W. M. DE VOS. Dept. of Microbiol., Agricultural University Wageningen, Wageningen, The Netherlands.

**I15.** The Product of the *mcrD* Gene Is Involved in Methanogenesis. (289) D. STROUP\* and J. N. REEVE. Dept. of Microbiol., Ohio State Univ., Columbus.

**I16.** Intervening Sequences in the 16S rRNA Genes of Naturally Occurring Hyperthermophilic Archaeobacteria. (291) G. S. WICKHAM,\* D. J. LANE, S. KIM, and N. R. PACE. Indiana Univ., Bloomington, and Gene-Trak Systems, Framingham, Mass.

**I17.** Regulation of a Novel Methanogen Enzyme by Phosphorylation. (293) M. F. ROBERTS,\* N. RAO, K. SASTRY, and A. TORRIANI. Boston Col., Chestnut Hill, Mass., and MIT, Cambridge, Mass.

**I18.** Cloning of Component A2 of the Methylreductase System from *Methanobacterium thermoautotrophicum*  $\Delta$ H. (295) C. H. KUHNER,\* B. D. LINDENBACH, and R. S. WOLFE. Dept. of Microbiol., Univ. of Illinois, Urbana.

**I19.** Characterization of Polyferredoxin from *Methanobacterium thermoautotrophicum*  $\Delta$ H. (297) V. J. STEIGERWALD, T. D. PIHL,\* and J. N. REEVE. Dept. of Microbiol., Ohio State Univ., Columbus.

**I20.** Purification and Characterization of Acetohydroxy Acid Synthase from the Archaeobacterium *Methanococcus aeolicus*. (299) R. XING\* and W. B. WHITMAN. Univ. of Georgia, Athens.

**I21.** Pathway of Glycogen Catabolism in *Methanococcus marisplacidis*. (301) J. P. YU,\* J. A. LADAPO, and W. B. WHITMAN. Dept. of Microbiol., Univ. of Georgia, Athens.

**I22.** Purification of Corrinoid Proteins Methylated by Acetate from *Methanosarcina barkeri*. (303) J. D. KREMER,\* X. CAO, and J. A. KRZYCKI. Ohio State Univ., Columbus.

**I23.** Inhibition of Methanogenesis in *Methanobacterium thermoautotrophicum* by Lumazine. (305) K. R. NAGARANTHAL\* and D. P. NAGLE, JR. Univ. of Oklahoma, Norman.

**I24.** Pyrimidine Nucleotide Metabolism in the Extremely Thermophilic Archaeobacterium *Sulfolobus shibatae*. (307) L. LINDE. Inst. of Biol. Chemistry, Univ. of Copenhagen, Copenhagen, Denmark.

**I25.** The Methyl-Tetrahydromethanopterin:Methyl-Coenzyme M Methyltransferase as a Primary Sodium Pump in the Methanogenic Bacterium Strain Go1. (309) B. BECHER, V. MULLER,\* and G. GOTTSCHALK. Inst. für Mikrobiologie, Göttingen, Germany.

**I26.** Glycine Betaine and Potassium Are the Major Compatible Solutes in the Extreme Halophilic Methanogen *Methanohalo-*

## POSTER SESSIONS

Wednesday, 3:00-4:30 P.M., Exhibit Hall C

(Board numbers in parentheses)

### Session 74 (F). EPIDEMIOLOGY OF FUNGAL INFECTIONS

- F17. Changing Patterns of Fungemia in an Inner City Hospital. (002) B. PETERS,\* J. BRUCE, and W. FREDERICK. Howard Univ. Hosp., Washington, D.C.
- F18. Outbreak of Fungemias Due to *Candida parapsilosis* from a Multidose Bottle of Liquid Glycerin in a Neonatal Intensive Care Unit. (004) S. WELBEL,\* M. MCNEIL, A. PRAMANIK, and T. LOTT. CDC, Atlanta, Ga., and Louisiana State Med. Ctr., Shreveport.
- F19. Serotype-Related Differences in Oral *Candida albicans* Colonization and Infection from Two Immunosuppressed Populations. (006) A. HOVAN\* and D. L. BRAWNER. Dept. of Oral Med., Univ. of Washington, and Fred Hutchinson Cancer Res. Ctr., Seattle, and Dept. of Microbiol., Montana State Univ., Bozeman.
- F20. *Cryptococcus neoformans* Infections in North America: Results of a 2-Year Prospective Survey. (008) C. HALDE,\* M. MCNEIL, M. VALESCO, and M. FLORES. Univ. of California, San Francisco; CDC, Atlanta, Ga.; Alameda County Publ. Health Lab., Oakland, Calif.; and Dept. of Publ. Health, Berkeley, Calif.
- F21. Assessment of Air Quality Monitoring following Failure of a Protective Environment To Prevent Invasive Aspergillosis in Neutropenic Patients during Major Construction. (010) P. C. IWEN,\* J. C. DAVIS, and B. A. WINFIELD. Univ. of Nebraska Med. Ctr., Omaha.
- F22. Can the Safety of Fungi Associated with Crops Be Managed through Fungal Domestication? (012) P. J. COTTY\* and D. S. EGEL. USDA, Agricultural Res. Service, Southern Regional Res. Ctr., New Orleans, La.
- F23. *Onychocola canadensis*, an Emerging Agent of Nondermatophytic Onychomycosis. (014) L. SIGLER\* and A. WOODGYER. Univ. of Alberta, Edmonton, Alberta, Canada, and New Zealand Communicable Disease Ctr., Porirua, New Zealand.
- F24. Interesting Fungal Isolates from Natal, South Africa. (016) L. ROUX. Dept. of Med. Microbiol., King Edward VIII Hosp., Durban, Republic of South Africa.
- F25. *Rhizomucor pusillus* Infection in Four Leukemia Patients. (018) G. ST-GERMAIN,\* A. ROBERT, M. ISHAK, C. TREMBLAY, and S. CLAVEAU. Lab. de Santé Publ. du Québec, Hôpital Maisonneuve-Rosemont, L'Hôtel-Dieu de Québec, Quebec, Canada.
- F26. Soft Tissue Phaeohyphomycotic Abscess Due to the *Scytalidium dimidiatum* Synanamorph of *Natrassia mangiferae*. (020) D. A. MCGOUGH,\* C. R. BODEM, K. FAWCETT, P. MOODY, A. W. FOTHERGILL, and M. G. RINALDI. Univ. of Texas Health Sci. Ctr., San Antonio, and St. Joseph's Hosp., Flint, Mich.
- F27. *Actinomyces madurae* Pneumonia in an AIDS Patient. (022) M. MCNEIL,\* J. BROWN, G. SCALISE, and C. PIERSIMONI. CDC, Atlanta, Ga., and Gen. Hosp. "Umberto I-Torrette," Ancona, Italy.
- F28. Phaeohyphomycosis of the Skin Due to *Exserohilum rostratum* in a Cocaine User. (024) S. LAVOIE, A. ESPINELINGROFF, and T. M. KERKERING.\* Med. Col. of Virginia/Virginia Commonwealth Univ., Richmond.

- F29. Phaeohyphomycotic Cyst Caused by *Phialemonium curvatum*. (026) D. KING,\* J. D. MICHELSON, D. DIXON, and W. G. MERZ. Johns Hopkins Med. Inst., Baltimore, Md., and New York State Dept. of Health, Albany.
- F30. Fungal Peritonitis Caused by *Phialemonium obovatum*. (028) L. PASARELL,\* M. R. MCGINNIS, M. EL-ZAATARI, and N. DUNNELL. Dept. of Pathology, Univ. of Texas Med. Branch, Galveston.
- F31. *Scedosporium inflatum* Osteomyelitis in a Dog. (030) I. F. SALKIN,\* C. R. COOPER, M. E. KEMNA, M. R. RINALDI, and J. W. BARTGES. New York State Dept. of Health, Albany, N.Y.; Univ. of Texas Health Sci. Ctr., San Antonio; and Univ. of Minnesota, St. Paul.
- F32. Fatal Pulmonary Sporotrichosis in India Caused by *Sporothrix schenckii* var. *luriei*. (032) L. KAUFMAN,\* A. A. PADHYE, E. DURREY, and A. CHAKRABARTI. CDC, Atlanta, Ga., and Postgrad. Inst. for Med. Education and Res., Chandigarh, India.

### Session 75 (C). BACTEREMIA AND FUNGEMIA II

- C75. Comparison of the Blood Culture Medium BHI Release for Septi-Check (Roche) with the Signal Oxoid System. (034) P. RÖHNER,\* B. PEPEY, and R. AUCKENTHALER. Central Bacteriol. Lab., Univ. Hosp., Geneva, Switzerland.
- C76. Clinical Comparison of Sentinel, a Novel Blood Culture System, with BACTEC and Isolator 10 Blood Culture Systems for the Detection of Streptococcal and Anaerobic Bacteremias. (036) D. SHANSON,\* N. HUTCHINSON, and T. MALINS. Dept. of Med. Microbiol. and Dept. of Oral Surgery, Westminster Hosp., London, U.K.
- C77. Novel Application of DNA Probe Technology for the Detection of Septicemia in Pediatric Populations. (038) T. DAVIS,\* D. FULLER, L. KINNEY, D. HURTZ, J. REYNOLDS, and S. ALLEN. Wishard Mem. Hosp.-Indiana Univ. Med. Ctr., Indianapolis.
- C78. A New Automated Blood Culture System. (040) C. COUTURIER, J.-P. MARCEL,\* and F. VILLEVAL. BioMérieux, La Balme les Grottes, France.
- C79. How Important Are Anaerobic Blood Culture Vials for Documenting Bacteremia in Adults? (042) J. E. MCGOWAN, JR.,\* and B. G. METCHOCK. Grady Mem. Hosp. and Emory Univ. Sch. of Med., Atlanta, Ga.
- C80. Keep Those Blood Cultures for 7 Days! (044) R. SOOD,\* E. SORDILLO, and V. BOKKENHEUSER. St. Luke's/Roosevelt Hosp. Ctr., New York, N.Y.
- C81. Clinical Relevance of Follow-Up Blood Cultures in a Medical Intensive Care Unit. (046) P. L. ARMELL, J. C. MCLAUGHLIN,\* H. LEVY, S. A. FORTNER, and M. C. ROBLES. Univ. of New Mexico Sch. of Med., Albuquerque.
- C82. Improved Detection of Bacteremia through Enhancement of Blood Culture Collections. (048) R. BARTLETT,\* S. LOBEL, J. TETREAU, and A. ROBINSON. Hartford Hosp., Hartford, Conn.
- C83. Evaluation of the Resin Technology for Inactivation of Antibiotics in Blood Cultures. (050) C. BARTLEY, M. SECRIST, L. MUI, and N. SULLIVAN.\* Difco Lab., Res. and Development, Ann Arbor, Mich.
- C84. Inferior Yield of Small-Volume Blood Cultures in Adult Patients. (052) L. MERMEL\* and D. G. MAKI. Rhode Island Hosp., Brown Univ., Providence, and Univ. of Wisconsin Hosp., Madison.
- C85. Impact of a Policy Revision on Collection of Single Blood Cultures from Pediatric and Adult Patients in a Community Hospital. (054) J. A. KELLOGG\* and D. A. BANKERT. York Hosp., York, Pa.

- C86.** An Unfrequent Cause of False-Positive Blood Cultures. (056) M. ROSA,\* R. MARTINEZ, Y. PARTAL, J. CASAS, J. LLOSA, and M. ALMAGRO. Microbiol., Virgen Nieves Hosp., Granada, Spain.
- C87.** Effect of Delayed Processing of Isolator Tubes on Recovery of *Mycobacterium avium* Complex from Blood. (058) B. METCHOCK,\* L. DIEM, J. HAVLIK, S. GORDON, C. R. HORSBURGH, and J. E. MCGOWAN, JR. Grady Mem. Hosp. and Emory Univ. Sch. of Med., Atlanta, Ga.
- C88.** Comparison of Gram Stain, Acridine Orange Stain, and Subculture in Instrument-Positive BACTEC Nonradiometric Blood Culture Media. (060) N. GORNISH\* and M. P. WEINSTEIN. Univ. of Med. and Dent. of New Jersey-Robert Wood Johnson Med. Sch. and Univ. Hosp., New Brunswick.
- C89.** Direct Detection of *Staphylococcus aureus* in Blood Cultures Using the RAPIDEC Staph. (062) R. B. CAREY. St. Francis Hosp., Evanston, Ill.
- C90.** Comparison of Identification Systems for Coagulase-Negative Staphylococci Bloodstream Isolates. (064) P. RHOMBERG, T. PERL,\* M. BALE, M. GEISS, R. JONES, F. KOONTZ, and M. PFALLER. Univ. of Iowa Col. of Med., Iowa City.
- C91.** Effects of Delayed Incubation of Blood Cultures on the Isolation of *Streptococcus pneumoniae* in Pediatric Patients. (066) K. HANSON,\* M. ROBACK, R. KLICKER, A. TSAI, and R. GRUNINGER. Hennepin County Med. Ctr., Minneapolis, Minn.
- C92.** Rapid Identification and Susceptibility Testing of Blood Culture Isolates. (068) J. CARD and M. ALFA.\* Dept. of Microbiol., St. Boniface Gen. Hosp., Winnipeg, Manitoba, Canada.
- C93.** Rapid Detection, Identification, and Susceptibility Testing of Bacterial Blood Culture Isolates: an Economic Analysis. (070) F. M. SMAILL,\* H. L. RICHARDSON, and J. GUNMUNRO. Chedoke-McMaster Hosp., Hamilton, Ontario, Canada.
- C94.** Optimizing Blood Culture Reports for Clinical Outcome Utilizing BACTEC 660, Vitek Identification and Susceptibility Testing, and the Sunquest Laboratory Information System. (072) H. RICHARDSON, J. GUNMUNRO,\* D. O'NEILL, and F. SMAILL. Chedoke-McMaster Hosp., Hamilton, Ontario, Canada.
- C95.** Intrinsic Contamination by *Bacillus* in Blood Culture Media: Implications for Quality Control in Adoptive Immunotherapy. (074) G. DU MOULIN,\* C. CYR, J. CHEWDARKE, Z. PITKIN, J. STACK, M. E. OSBAND, and B. TORRES. Cellcor Therapies, Newton, Mass., and Univ. of Massachusetts Med. Ctr., Worcester.

### Session 76 (A). SUSCEPTIBILITY OF FUNGI AND OTHER MICROORGANISMS

- A34.** In Vitro Susceptibility of *Mycobacterium kansasii* to Clarithromycin and Isoniazid. (076) J. R. BIEHLE\* and S. J. CAVALIERI. Creighton Univ. Med. Ctr., Omaha, Nebr.
- A35.** Inhibition of *Toxoplasma gondii* Protein Synthesis by Azithromycin. (078) J. BLAIS,\* V. GARNEAU, and S. CHAMBERLAND. Ctr. de Recherche du Ctr. Hosp. de l'Univ. Laval, Quebec, Quebec, Canada.
- A36.** *Borrelia burgdorferi* Is Susceptible to Vancomycin In Vitro. (080) L. L. DEVER,\* J. H. JORGENSEN, and A. G. BARBOUR. Univ. of Texas Health Sci. Ctr., San Antonio.
- A37.** Nosocomial Infection with *Torulopsis glabrata*: an Epidemiologic Study. (082) L. M. DEMBRY,\* V. SANCHEZ, M. VAZQUEZ, J. D. SOBEL, M. J. ZERVOS, and J. VAZQUEZ. William Beaumont Hosp., Royal Oak, Mich., and Wayne State Univ., Detroit, Mich.

- A38.** In Vitro Activities of Ciprofloxacin, Daptomycin, Teicoplanin, and Vancomycin against Clinical Isolates of *Corynebacterium jeikeium*. (084) L. STEELE-MOORE,\* K. FURNESS, and W. J. HOLLOWAY. Med. Ctr. of Delaware, Wilmington.
- A39.** Physicochemical State of Miconazole in Relation to Its Direct Lethal Action. (086) W. H. BEGGS. VA Med. Ctr., Minneapolis, Minn.
- A40.** Inhibition of Cell Wall Biosynthesis in *Candida albicans* by Extracts of Marine Organisms. (088) P. J. MCCARTHY\* and T. A. PETERSON. Harbor Branch Oceanographic Inst., Fort Pierce, Fla.
- A41.** Activity of a New Echinocandin, L-688,786, against Filamentous Fungi. (090) C. DOUGLAS,\* J. MARRINAN, J. Curotto, J. ONISHI, and M. KURTZ. Merck Sharp & Dohme Res. Lab., Rahway, N.J.
- A42.** Formulations of Amphotericin B with Egg Lecithin-Bile Salt Mixed Micelles Evaluated in the Treatment of Murine Candidiasis and Cryptococcosis. (092) J. BRAITBURG,\* S. ELBERG, S. J. TRAVIS, and G. S. KOBAYASHI. Washington Univ. Sch. of Med., St. Louis, Mo.
- A43.** Characterization and Cellular Effects of Amphotericin B Formulated with Egg Lecithin-Bile Salt Mixed Micelles. (094) J. BRAITBURG,\* S. ELBERG, G. S. KOBAYASHI, and J. BOLARD. Washington Univ. Sch. of Med., St. Louis, Mo., and Univ. Pierre et Marie Curie, Paris, France.
- A44.** Fluconazole Therapy of Hepatosplenic Candidiasis in Neutropenic Rabbits. (096) M. A. FISHER,\* H. SHEN, A. ROGERS, M. BILLIE, M. EDMOND, and W. TARRY. West Virginia Univ. Health Sci. Ctr., Morgantown.
- A45.** Fungitoxic Activity of Phenolic Antioxidants on Conidial Germination and Colony Diameter of Toxigenic Species of *Fusarium* and *Penicillium*. (098) D. P. THOMPSON. Health Res. Ctr. and Dept. of Biol., Southern Univ., Baton Rouge, La.
- A46.** Reduced Toxicity and Improved Antifungal Efficacy of Liposomal Hamycin In Vitro and In Vivo. (100) R. T. MEHTA,\* T. J. MCQUEEN, A. KEYHANI, and G. LOPEZ-BERESTEIN. Dept. of Med. Oncology, M.D. Anderson Cancer Ctr., Houston, Tex.
- A47.** Susceptibility of *Plasmodium falciparum* In Vitro to Artesunate and Mefloquine Alone and in Combination. (102) D. KYLE,\* S. LOOAREESUWAN, C. CANFIELD, and K. WEBSTER. Armed Forces Res. Inst. of Med. Sci. and Bangkok Hosp. for Tropical Diseases, Bangkok, Thailand, and Pharmaceutical Systems, Inc., Gaithersburg, Md.

### Session 77 (A). MISCELLANEOUS: ANTIMICROBIAL ACTIVITY

- A48.** Pharmacodynamic Interaction of Biofilm Cells of *Staphylococcus aureus* with Cephalexin and Tobramycin. (104) H. ANWAR\* and J. L. STRAP. Univ. of Alberta, Edmonton, Alberta, Canada.
- A49.** Diverse Tobramycin Efficacy on Ca<sup>2+</sup>- and Mg<sup>2+</sup>-Treated *Pseudomonas aeruginosa* Biofilms. (106) B. D. HOYLE\* and C. K. W. WONG. Biofilm Group, Dept. of Biol. Sci., Univ. of Calgary, Calgary, Alberta, Canada.
- A50.** Effect of Growth Rate upon the Susceptibility of Intact *Staphylococcus epidermidis*, *Pseudomonas aeruginosa*, and *Escherichia coli* Biofilms to Ciprofloxacin. (108) S. GANDER,\* I. G. DUGUID, S. M. NELSON, M. R. W. BROWN, and P. GILBERT. Dept. of Pharmacy, Manchester Univ., Manchester, U.K., and Pharmaceutical Sci. Inst., Aston Univ., Birmingham, U.K.
- A51.** Effects of Metal and Nonmetal Electrodes and Media Composition on Microbial Population Reduction and Killing by Electrophoresis. (110) C. P. DAVIS,\* N. M. WAGLE, M. D.



- ANDERSON, and M. M. WARREN. Univ. of Texas Med. Branch, Galveston.
- A52. In Vitro Growth Inhibition and Reduction of Bacitracin Sensitivity of *Streptococcus mutans* by Aspartame. (112) M. M. JONAH,\* M. CALVIN, S. FISSEHA, L. GONZALEZ, and A. TREONIS. Rosary Col., River Forest, Ill.
- A53. Effects of Temperature and Specific Nutrients on Fluoride Resistance in *Streptococcus mutans*. (114) R. P. STORY and T. A. KRAL.\* Univ. of Arkansas, Fayetteville.
- A54. Effect of Chlorpromazine on the Agglutination of *Salmonella typhimurium* by O Antigen Antibody. (116) L. AMARAL, A. KISH, and V. LORIAN.\* Bronx Lebanon Hosp. Ctr., Bronx, N.Y.
- A55. In Vitro Activities of Antiretroviral Agents against *Salmonella*. (118) S. J. SPERBER,\* E. FEIBUSCH, and M. P. WEINSTEIN. Univ. of Med. and Dent. of New Jersey-Robert Wood Johnson Med. Sch., New Brunswick.
- A56. Germicidal Effect of 2-Methoxy-4(2-propenyl)-phenol on Oral Anaerobes. (120) V. K. SHARMA\* and J. C. HAGEN. Loyola Univ. Sch. of Dent., Maywood, Ill.
- A57. In Vitro Antimicrobial Activity of a Modified Central Venous Catheter Flush Solution. (122) W. M. DUNNE, JR.,\* and K. J. HENRICKSON. Baylor Col. of Med., Houston, Tex., and Med. Col. of Wisconsin, Milwaukee.
- A58. In Vitro Evaluation of Ciprofloxacin and Rifampin-Impregnated Polymethylmethacrylate Beads. (124) N. PATEL,\* A. LEVY, and R. LEVY. Albert Einstein Med. Ctr., Philadelphia, Pa.
- A59. Chemiluminescence and Degranulation of Human Neutrophils by *Haemophilus influenzae* Preincubated with Sub-MIC of  $\beta$ -Lactam Antibiotics, Doxycycline, Chloramphenicol, and Pefloxacin. (126) M. BONNET, P. VAN DER AUWERA, and J. KLASTERSKY.\* Inst. J. Bordet, Brussels, Belgium.
- A60. Effect of Topical Clindamycin Therapy on Cutaneous *Staphylococcus* Species. (128) W. E. KLOOS,\* C. G. GEORGE, and L. A. JONES-PARK. North Carolina State Univ., Raleigh.
- A61. Representation of Common Ocular Pathogens Associated with Contact Lens-Related Keratitis by FDA Test Microbes. (130) N. MONTAG, M. A. MAGEE, L. BRUNNER, H. BORNEMANN, A. LANCE, R. FRANCO, and C. B. JESSEE.\* Bausch & Lomb, Rochester, N.Y.
- A62. Efficacy of Ivermectin in Treatment of Strongyloidiasis Complicating AIDS. (132) J. TORRES\* and R. ISTURIZ. Univ. Hosp., Univ. Central de Venezuela, and Ctr. Med. de Caracas, Caracas, Venezuela.
- A63. Antibacterial Activity of *Crotalis atrox* Venom and L-Amino Acid Oxidase against Antibiotic-Resistant Aerobic Bacteria. (134) K. SHRINER,\* D. CITRON, D. TALAN, and E. GOLDSTEIN. UCLA/Olive View Med. Ctr., Sylmar, Calif., and R. M. Alden Res. Lab., Santa Monica, Calif.
- A64. Isolation and Characterization of the Antibacterial Activity of *Crotalis atrox* Venom. (136) D. TALAN,\* K. SHRINER, D. CITRON, K. MIYASAKI, J. GLENN, and E. GOLDSTEIN. Olive View/UCLA Med. Ctr., Sylmar, Calif., and R. M. Alden Res. Lab., Santa Monica, Calif.
- A65. Antimicrobial Activity of an Antisense Peptide and Two Analogs. (138) R. SALAS-AUVERT,\* R. HARRISON, and D. MCCARTHY. Univ. of Oklahoma, Norman.
- A66. Antibiotic Control: Comparison of Two Methods in a Large Teaching Hospital. (140) C. RAMIREZ RAMIREZ, A. COLLAZO, C. H. RAMIREZ RONDA,\* M. COLON, and S. SAAVEDRA. Infectious Diseases Program, Univ. of Puerto Rico Sch. of Med., and VA Med. Ctr., San Juan, Puerto Rico.
- A67. Stress Protein Induced by Antibiotic Treatment in *Streptococcus pneumoniae*. (142) P. MOREILLON\* and A. TOMASZ. Rockefeller Univ., New York, N.Y.
- A68. Survivorship of *Enterococcus faecalis* or *Staphylococcus aureus* Exposed to Vancomycin with or without Gentamicin. (144) L. R. BARTHOLOMEW\* and R. K. FORSTER. King Khaled Eye Specialist Hosp., Riyadh, Kingdom of Saudi Arabia.
- A69. Comparison of In Vitro Susceptibility of *Legionella pneumophila* to Erythromycin and Rifampin Analogs. (146) S. U. WOLF,\* C. A. BORTNER, and J. V. URI. Philadelphia Col. of Osteopathic Med., Philadelphia, Pa.
- A70. In Vitro Antibacterial Activity of Cefpodoxime-Proxetil, Cefmetazole Sodium, and Trospicromycin against Common Pathogens at a Community Hospital. (148) A. GUPTA,\* S. CROSSLAND, U. DESAI, and J. THURA. Northern Virginia Doctors Hosp., Arlington.
- A71. Ciprofloxacin and Nalidixic Acid Inhibit the Induction of Class I  $\beta$ -Lactamase in *Enterobacter cloacae*. (150) A. C. OTTOLENGHI. Ohio State Univ. Col. of Med., Columbus.
- A72. Sulfonamide Resistance in *Haemophilus influenzae*. (152) V. C. LIU\* and A. L. SMITH. Children's Hosp. and Med. Ctr., Seattle, Wash.
- A73. Dose-Related Antimetabolic and Antiviral Activities of Delta-9-Tetrahydrocannabinol. (154) J.-I. SIN,\* A. BROWN, H. BULLOCK, J.-L. TANG, S. FAMILO, L. J. PARADISE, and G. LANCZ. Univ. of South Florida, Tampa.
- A74. Postantibiotic Effect of Selected Antibiotic Tested in Milk from an Infected Bovine Mammary Gland and Implications for Therapy of Bovine Mastitis. (156) W. E. OWENS\* and C. H. RAY. Hill Farm Res. Station, Louisiana State Univ. Agricultural Ctr., Homer.
- A75. Evaluation of a Random Access Fluorescence Polarization Immunoassay System for Monitoring Antibiotic Levels. (158) R. CHUA, M. SKULNICK, and D. KITCHING.\* Mount Sinai Hosp., Toronto, Ontario, Canada.
- A76. PC-Based Internodal Expert Systems for Antibiotic Therapy Quality Control. (160) R. MORRELL\* and B. WASILAUSKAS. Wake Forest Univ. Med. Ctr., Winston-Salem, N.C.

### Session 78 (Q). BIODEGRADATION OF LIGNIN AND POLYAROMATIC HYDROCARBONS

- Q84. Reduction of Pentachlorophenol Toxicity to Growth of a Selected Microbial Consortium by Pretreatment with *Phanerochaete chrysosporium* and Fenton's Reagent. (162) L. E. KOVACH,\* S. H. LEE, and J. B. CARBERRY. ICI Pharmaceuticals, Wilmington, Del., and Univ. of Delaware, Newark.
- Q85. A DNA Probe for Peroxidase Genes in Actinomycetes. (164) B. MAHADEVAN\* and D. L. CRAWFORD. Univ. of Idaho, Moscow.
- Q86. Enzymatic Biotransformation of Chlorinated and Non-chlorinated Aromatic Compounds. (166) D.-M. LI,\* A. R. SIAHPUSH, R. F. HICKEY, and H. WANG. Michigan Biotechnology Inst., Lansing, and Dept. of Chemical Engineering, Univ. of Michigan, Ann Arbor.
- Q87. Distribution of DNA Sequences Homologous to *Phanerochaete chrysosporium* Lignin Peroxidase Genes in Selected Genera of White-Rot and Brown-Rot Fungi. (168) T. M. D'SOUZA\* and C. A. REDDY. Dept. of Microbiol., Michigan State Univ., East Lansing.
- Q88. Effect of Nitrogen Concentration on Lignin Degradation by Mycorrhizal Fungi. (170) P. K. DONNELLY\* and J. A. ENTRY. Univ. of Idaho, Moscow, and Oregon State Univ., Corvallis.
- Q89. Role of Extracellular Fungal Sheaths in Wood Biodegradation: a Cytochemical Investigation. (172) M. NICOLE,\* H.

CHAMBERLAND, J. P. GEIGER, J. VALERO, N. LECOURS, and G. B. OUELLETTE. Orstom/Forets Canada, Ste-Foy, Quebec, Canada.

**Q90.** Esterase and Peroxidase Production by Coal-Depolymerizing *Pseudomonas* Strain DLC-62. (174) M. ROBERTS\* and D. L. CRAWFORD. Univ. of Idaho, Moscow.

**Q91.** Contrasts between Subsurface Microbial Communities and Their Metabolic Adaptation to Polycyclic Aromatic Hydrocarbons at a Forested and an Urban Coal-Tar Disposal Site. (176) E. L. MADSEN,\* A. WINDING, K. MALACHOWSKY, C. T. THOMAS, and W. C. GHIORSE. Cornell Univ., Ithaca, N.Y.

**Q92.** Effect of Nonionic Surfactants on Bioavailability of Polynuclear Aromatic Hydrocarbons in a Coal-Coking Waste. (178) J. SANSEVERINO,\* J. RIGHTMEYER, and G. S. SAYLER. IT Corp., Knoxville, Tenn., and Ctr. for Environmental Biotechnology, Univ. of Tennessee, Knoxville.

**Q93.** Identification of Anthracene *trans*-1,2-Dihydrodiol Enantiomers and Xyloside Conjugates Formed by *Rhizoctonia solani*. (180) J. B. SUTHERLAND,\* A. L. SELBY, J. P. FREEMAN, P. P. FU, and D. W. MILLER. Nat. Ctr. for Toxicological Res., FDA, Jefferson, Ark.

**Q94.** The Role of Yeasts in Biotransformation and Bioavailability of Phenanthrene in Coastal Sediments. (182) A. R. MACGILLIVRAY\* and M. P. SHIARIS. Univ. of Massachusetts, Boston.

**Q95.** Initial Oxidative and Conjugative Metabolites Produced during the Metabolism of Phenanthrene by Filamentous Fungi. (184) R. P. CASILLAS,\* S. A. CROW, JR., and T. HEINZE. Georgia State Univ., Atlanta, and Nat. Ctr. for Toxicological Res., FDA, Jefferson, Ark.

**Q96.** Degradation of Mixtures of High-Molecular-Weight Polycyclic Aromatic Hydrocarbons by a *Mycobacterium* sp. (186) I. KELLEY\* and C. CERNIGLIA. Nat. Ctr. for Toxicological Res., FDA, Jefferson, Ark.

**Q97.** Metabolism of Acenaphthene by the Fungus *Cunninghamella elegans*. (188) J. V. POTHULURI,\* J. P. FREEMAN, and F. E. EVANS. Nat. Ctr. for Toxicological Res., FDA, Jefferson, Ark.

**Q98.** Biodegradation and Bioaccumulation of Benzo[a]pyrene by Fungi. (190) K. G. WUNCH,\* P. BAYMAN, and J. W. BENNETT. Tulane Univ., New Orleans, La.

**Q99.** Rational Use of Surfactants in Benzo[a]pyrene Biodegradation. (192) A. R. SIAHPUSH,\* H. Y. WANG, and R. F. HICKEY. Dept. of Chemical Engineering, Univ. of Michigan, Ann Arbor, and Michigan Biotechnology Inst., Lansing.

**Q100.** Biodegradation of Polycyclic Aromatic Hydrocarbons in Buffalo River Sediment by Indigenous Microorganisms. (194) B. A. NUMMER,\* M. MOLINA, and R. ARAUJO. Univ. of Georgia and U.S. EPA, Athens.

**Q101.** Differentiation of a Rapidly Growing Strain of *Mycobacterium* sp. from Other Known *Mycobacterium* Species. (196) F. RAFII\* and C. E. CERNIGLIA. Nat. Ctr. for Toxicological Res., FDA, Jefferson, Ark., and CDC, Atlanta, Ga.

**Q102.** Isolation and Characterization of a Fluorene-Degrading Bacterium: Identification of Ring Oxidation Metabolites. (198) M. GRIFOLL,\* M. CASELLAS, J. M. BAYONA, and A. M. SOLANAS. Univ. of Barcelona and CID, CSIC, Barcelona, Spain.

**Q103.** Effects of Cosolvent Additions on General Microbial Activity and Biodegradation of PAH Compounds in Soil from a Wood Treatment Facility. (200) J. KUSTRITZ,\* J. PRESTON, and D. DOBBINS. BioTrol, Inc., Chaska, Minn.

**Q104.** Oxygen Uptake and CO<sub>2</sub> Respiration by the Indigenous Microflora at a Superfund Wood-Treating Site. (202) K. H. BAKER,\* D. S. HERSON, M. G. WADDINGTON, K. E. THOMAS, and C. D. LITCHFIELD. Environmental Micro-

biol. Associates, Harrisburg, Pa.; Univ. of Delaware, Newark; and Environmental Technology Applications, Monroeville, Pa.

**Q105.** Degradation of Polycyclic Aromatic Hydrocarbons in Discarded Railroad Cross-ties. (204) C. J. BERRY,\* M. M. FRANCK, K. LOMBARD, and C. B. FLIERMANS. Savannah River Lab. and Bechtel Savannah River, Aiken, S.C.

## Session 79 (H). PLASMIDS: NOVEL PROPERTIES

**H114.** Genetic and Molecular Characterization of a Plasmid Ent STA, Coding for Multidrug Resistance in *Escherichia coli* of Human Origin. (206) Y. MARTINEZ-LAGUNA,\* M. A. PRECIADO TELLO, and B. E. BACA. Dept. de Investigaciones Microbiol., Univ. Autónoma de Puebla, Puebla, Mexico.

**H115.** The Arsenical ATPase Efflux System from IncFI Plasmid R773 also Mediates Tellurite Resistance. (208) R. J. TURNER, Y. HOU, J. H. WEINER, and D. E. TAYLOR.\* Univ. of Alberta, Edmonton, Alberta, Canada.

**H116.** Copper Resistance in Large Plasmids of *Alcaligenes eutrophus*. (210) P. CORBISIER,\* L. DIELS, G. NUYTS, W. BAEYENS, and M. MERGEAY. Lab. of Genetics and Biotechnology, Flemish Inst. of Technological Res. (VITO-SCK/CEN), Mol, Belgium.

**H117.** Genetic Analysis of Transposable Mercury Resistance Encoded by the OCT Plasmid (212) C.-S. WANG\* and D. A. KUNZ. Univ. of North Texas, Denton.

**H118.** Regulation of Plasmid-Borne 2,4-Dichlorophenoxyacetate Catabolic Genes Involves Multiple Regulatory Genes. (214) I.-S. YOU. Dept. of Biol., California State Univ., Fresno.

**H119.** *acc*, the Agrocinnopine Catabolic Region of *Agrobacterium tumefaciens* Ti Plasmid pTiC58, Encodes Multiple Genes Required for Opine and Agrocinn 84 Transport. (216) G. T. HAYMAN,\* S. BECK VON BODMAN, P. JIANG, and S. K. FARRAND. Nat. Ctr. for Agricultural Utilization Res., USDA, Agricultural Res. Service, Peoria, Ill., and Dept. of Plant Pathology and Dept. of Microbiol., Univ. of Illinois, Urbana.

**H120.** Visualization and Characterization of Plasmids from Three Species of *Gluconobacter*. (218) L. A. MCKIBBEN\* and G. W. CLAUS. Virginia Polytechnic Inst. and State Univ., Blacksburg.

**H121.** Molecular Analysis of Plasmids from *Thiobacillus ferrooxidans*. (220) T. J. ZUPANCIC,\* L. CHAKRAVARTY, B. BAKER, J. D. KITTLE, I. FRY, D. T. PALMER, and O. H. TUOVINEN. Battelle, Columbus Laboratories, and Ohio State Univ., Columbus.

**H122.** Genetic Characterization of a Linear Plasmid from *Bacillus polymyxa*. (222) A. S. ROSADO and L. SELDIN.\* Microbiol. Inst., Federal Univ., Rio de Janeiro, Brazil.

**H123.** Characterization of a Plasmid from an Isolate of *Legionella pneumophila*. (224) E. C. PESCI, F. W. WOODLEY, P. MARINKOVIC, F. T. BAKER,\* and C. S. LUCIANO. Indiana Univ. of Pennsylvania, Indiana, Pa.

**H124.** Genetics of Lactate Utilization by the Ruminant Bacterium *Selenomonas ruminantium*. (226) G. A. MOORE,\* S. A. MARTIN, and R. G. DEAN. Univ. of Georgia, Athens.

**H125.** Isolation and Characterization of Cryptic Plasmids from Wild-Type Strains of *Butyrivibrio fibrisolvens*. (228) R. J. FORSTER,\* M. A. HEFFORD, S. DENG, and R. M. TEATHER. Ctr. for Food and Animal Res., Agriculture Canada, Ottawa, Ontario, Canada.

**H126.** DNA Sequencing of a Small, Cryptic Plasmid from a Rumen Bacterium of the Genus *Butyrivibrio*. (230) M. A. HEFFORD, R. J. FORSTER, and R. M. TEATHER.\* Ctr.

WEDNESDAY

for Food and Animal Res., Agriculture Canada, Ottawa, Ontario, Canada.

- H127.** Plasmid from *Treponema denticola*: Potential for a Plasmid-Based Gene Transfer System in the Order *Spirochaetales*? (232) J. MACDOUGALL,\* D. MARGARITA, and I. SAINT GIRONS. Inst. Pasteur, Paris, France.
- H128.** The Second Copy of the Gas Vesicle Gene Cluster of *Halobacterium halobium* NRC-1 Is Located on a Large Plasmid. (234) S. DASARMA,\* P. ARORA, J. PERKEL, W.-L. NG, and N. JACKETT. Univ. of Massachusetts, Amherst, and Cornell Univ. Med. Col., New York, N.Y.
- H129.** Novel Small Plasmids of *Dictyostelium purpureum*. (236) H. KIYOSAWA, G. J. PODGORSKI,\* J. E. HUGHES, and D. L. WELKER. Utah State Univ., Logan.
- H130.** Expression of Recombinant Plasmids Carrying *Corioliolus versicolor* Genes in *Escherichia coli* Cells. (238) A. C. WILLIAMS,\* N. L. MOORE, W. V. DASHEK, and A. L. WILLIAMS. Howard Univ., Washington, D.C., and Clark Atlanta Univ., Atlanta, Ga.

### Session 80 (I). ARCHAEBACTERIA II: DIVERSITY AND STRUCTURE

- I27.** Isolation and Characterization of a Methane-Producing Bacterium from a Hypersaline Pond in Southern New Mexico. (240) S. WATTS\* and L. P. JONES. Univ. of Texas, El Paso.
- I28.** Halophiles Isolated from Salt Crystals and Salt Brine: a Comparison. (242) R. L. MANCINELLI and M. R. WHITE.\* NASA-Ames Res. Ctr., Moffett Field, Calif.
- I29.** Isolation and Enumeration of H<sub>2</sub>:CO<sub>2</sub>-Utilizing Methanogenic Bacteria from the Rumen of a High-Grain-Fed Steer. (244) B. J. WILSEY\* and D. M. SCHAEFER. Univ. of Wisconsin, Madison.
- I30.** *Methanosarcina mazei* S-6 Lamina: Morphologic and Structural Characteristics. (246) L. MAYERHOFER,\* E. CONWAY DE MACARIO, and A. J. L. MACARIO. New York State Dept. of Health, Wadsworth Ctr. for Lab. and Res., and SUNY Sch. of Publ. Health, Albany.
- I31.** Hydroxydiether Lipid Structures in Methanogens May Provide Signatures to the Genus. (248) G. D. SPROTT,\* G. B. PATEL, I. EKEIL, and C. CHOQUET. Nat. Res. Council of Canada, Ottawa, Ontario, Canada.
- I32.** Lipid Composition of *Natronobacterium* sp. Strain SSL1 (ATCC 43988). (250) V. UPASANI,\* S. DESAI, and M. KATES. M.G. Sci. Inst. and Sch. of Sci., Gujarat Univ., Ahmedabad, India, and Univ. of Ottawa, Ottawa, Ontario, Canada.
- I33.** Biochemical Evidence of a New Type of Archaeobacterial Cell Surface Architecture in *Sulfolobus* spp. (252) D. W. GROGAN. UCLA, Los Angeles, Calif.
- I34.** Rapid Identification of Halobacterial Species by Protein Gel Electrophoresis. (254) H. STAN-LOTTER,\* F. J. LANG, M. RICHTER, C. NEUNINGER, and L. I. HOCHSTEIN. NASA Ames Res. Ctr., Moffett Field, Calif., and Inst. of Microbiol. and Genetics, Univ. of Vienna, Austria.

### Session 81 (K). EUKARYOTIC MICROBIAL METABOLISM

- K1.** Kinetic Analysis of the 55-kDa Form of Phosphatidylinositol 4-Kinase from *Saccharomyces cerevisiae*. (256) R. J. BUXEDA\* and G. M. CARMAN. Rutgers Univ., New Brunswick, N.J.
- K2.** Purification and Characterization of a 55-kDa Form of Phosphatidylinositol 4-Kinase from *Saccharomyces cerevisiae*

(258) J. T. NICKELS, JR.\* and G. M. CARMAN. Rutgers Univ., New Brunswick, N.J.

- K3.** Modulation of Steryl Ester Synthase Activity by Heme Competency in the Yeast *Saccharomyces cerevisiae*. (260) G. A. KEESLER,\* W. M. CASEY, and L. W. PARKS. North Carolina State Univ., Raleigh.
- K4.** Effect of Sterol Alterations on the Efficiency of Conjugation in Sterol Auxotrophs of the Yeast *Saccharomyces cerevisiae*. (262) M. E. TOMEO,\* G. FENNER, S. R. TOVE, and L. W. PARKS. North Carolina State Univ., Raleigh.
- K5.** Regulation of Reductive Processes by Glutathione in the Yeast *Saccharomyces cerevisiae*. (264) M. ELSKENS and M. J. PENNINGCKX.\* Free Univ. of Brussels, Brussels, Belgium.
- K6.** Metabolism of Inositol in the Phosphatidylinositol Cycle in *Neurospora crassa*. (266) B. A. HANSON. Canisius Col., Buffalo, N.Y.
- K7.** Inhibition of Sphingolipid Biosynthesis and Growth in *Neurospora crassa* by 1-Cycloserine. (268) L. R. AARONSON,\* R. M. BERNSTEIN, N. L. MCCANN, and J. A. FORBES. State Col. of Syracuse Univ., Utica, N.Y.
- K8.** Response of *Pichia guilliermondii* to High Levels of Calcium and Other Ions. (270) D. BURKE,\* S. Y. LI, and M. PETERSHEIM. Seton Hall Univ., South Orange, N.J.
- K9.** Guanine and Hypoxanthine Phosphoribosyltransferases from *Toxoplasma gondii*. (272) G. MAION\* and S. CHAMBERLAND. Ctr. de Recherche du Ctr. Hosp. de l'Univ. Laval, Quebec, Quebec, Canada.
- K10.** Regulation and Characterization of Cellulolytic and Xylanolytic Enzymes from the Polycentric Rumen Fungus *Opinomyces* PC-2. (274) X. L. LI,\* H. Z. CHEN, and L. G. LJUNGDAHL. Dept. of Biochemistry and Ctr. for Biol. Resource Recovery, Univ. of Georgia, Athens.
- K11.** Purification and Characterization of a  $\beta$ -Glucosidase from the Polycentric Rumen Fungus *Opinomyces* PC 2. (276) H. Z. CHEN,\* X. L. LI, and L. G. LJUNGDAHL. Dept. of Biochemistry and Ctr. for Biol. Resource Recovery, Univ. of Georgia, Athens.
- K12.** Purification and Properties of  $\beta$ -Glucosidase from an Ectomycorrhizal Fungus, *Pisolithus tinctorius* SMF. (278) W. CAO\* and R. A. KORUS. Univ. of Idaho, Moscow.
- K13.** Partial Purification of UDP-N-Acetyl-Glucosamine 4-Epimerase Induced during Encystment in *Giardia*. (280) P. T. MACECHKO,\* D. G. LINDMARK, and E. L. JARROLL. Cleveland State Univ., Cleveland, Ohio.
- K14.** Enzymatic and Immunological Properties of the Valyl-tRNA Synthetase from Trophozoites of *Giardia lamblia*. (282) G. MARCHIN,\* L. TURNER, and M. SYLTE. Kansas State Univ., Manhattan.
- K15.** Affinity Purification of Enzymes Involved in Aflatoxin Biosynthesis. (284) A. CHUTURGOON\* and M. DUTTON. Dept. of Physiology, Univ. of Natal, Med. Sch., Congella, Durban, South Africa.
- K16.** Sulfite Toxicity in the Yeast *Saccharomyces cerevisiae*. (286) J. D. WIGHTMAN, X. XU, B. L. GELLER, and A. T. BAKALINSKY.\* Oregon State Univ., Corvallis.

### Session 82

(Eligible for continuing education credit)

Wednesday, 4:45 P.M., Ballroom IA

Presentation of the President's Bowl

J. W. BENNETT, Past President, ASM

ASM Presidential Address

VIRUSES IN RECEPTORLAND

RICHARD L. CROWELL, Hahnemann Univ. Sch. of Med., Philadelphia, Pa.

**Session 83 (Committee on Ethical Practices).  
Round Table**

*(Eligible for continuing education credit)*

**A STAMPEDE OF ZEBRAS: A STAGED  
READING OF A PLAY ABOUT SCIENTIFIC  
MISCONDUCT BY ROBERT G. MARTIN**

Wednesday, 8:00 P.M., Room 20

*Convenors:* SUSAN GOTTESMAN, Nat. Cancer Inst., Bethesda, Md., and ROBERT G. MARTIN, Nat. Inst. of Diabetes, Digestive, and Kidney Diseases, Bethesda, Md.

A new postdoctoral fellow in the laboratory can't repeat experiments from the lab's recent paper. Is it the usual problems of inexperience, a new lab, and a new project? Have some of the materials gone bad, mutated, or died? Or is there something seriously wrong? How to proceed when there are other really hot experiments crying to get done? A group of professional actors present a reading of a play by molecular biologist Robert G. Martin that explores this situation and the consequences of making hurried choices. After the play, the Committee on Ethical Practices will provide some written suggestions for further discussion of the issues raised by the play.

Limited shuttle service will be provided from ASM hotels to the Convention Center for Session 83. Please consult shuttle schedules posted in hotel lobbies for complete service information.

**Session 84 (C). Seminar**

*(Eligible for continuing education credit)*

**NEW APPROACHES TO MOLECULAR  
EPIDEMIOLOGY**

Thursday, 8:30 A.M., Ballroom IA

*Convenors:* TERRENCE L. STULL, Med. Col. of Pennsylvania, Philadelphia, and FRED C. TENOVER, CDC, Atlanta, Ga.

Choosing Molecular Techniques for Your Microbiology Laboratory  
FRED C. TENOVER, CDC, Atlanta, Ga.

Field Inversion and Pulse Field Gel Electrophoresis  
RICHARD V. GOERING, Creighton Univ., Omaha, Nebr.

Molecular Epidemiology of Emerging Bacterial Pathogens Revealed by Multilocus Enzyme Electrophoresis  
JAMES M. MUSSER, Baylor Univ., Houston, Tex.

Restriction Fragment Length Polymorphism Analysis of Bacterial Pathogens  
JOHN OGLE, Univ. of Colorado Health Sci. Ctr., Denver

Ribotyping and Polymerase Chain Reaction Ribotyping  
TERRENCE L. STULL, Med. Col. of Pennsylvania, Philadelphia

**Session 85 (C). Round Table**

*(Eligible for continuing education credit)*

**PRACTICAL PROBLEMS IN CLINICAL  
MICROBIOLOGY**

Thursday, 8:30 A.M., Ballroom IB

*Convenors:* MARY J. R. GILCHRIST, VA Med. Ctr., Cincinnati, Ohio, and STEPHEN G. JENKINS, Baptist Med. Ctr., Jacksonville, Fla.

**8:30 Divisional Lecture  
Becton-Dickinson Award Lecture**

Evolving Technology and Changing Needs in Clinical Microbiology  
JAMES J. JORGENSEN, Univ. of Texas Health Sci. Ctr., San Antonio

**9:15 Sonnenwirth Memorial Lecture**

The Clinical Microbiologist: Past, Present, and Future  
PAUL D. ELLNER, Columbia Univ. Col. of Physicians and Surgeons, New York, N.Y.

**Round Table**

Each of the six speakers will address a practical problem in clinical microbiology that involves the deduction of appropriate methods, strategies, or reporting. The idea is that some of these conclusions might lead to the establishment of new standards of performance and interpretation of microbiology tests.

*Participants:* PATRICK R. MURRAY, JOSEPHINE A. MORELLO, PAUL A. GRANATO, CAROL SPIEGEL, JOSEPH L. STANECK, and GERRI S. HALL

**Session 86 (V). Seminar**

*(Eligible for continuing education credit)*

**HEPATITIS VIRUSES FROM A TO F**

Thursday, 8:30 A.M., Room 10

*Convenors:* MARIO R. ESCOBAR, Med. Col. of Virginia, Richmond, and ISA K. MUSHAHWAR, Abbott Lab., North Chicago, Ill.

Introduction  
ISA K. MUSHAHWAR, Abbott Lab., North Chicago, Ill.

Hepatitis A Update  
ROBERT H. PURCELL, NIH, Bethesda, Md.

Hepatitis B Update  
ADRIAN M. DIBISCEGLIE, NIH, Bethesda, Md.

Hepatitis C Update  
RICHARD R. LESNIEWSKI and GEORGE G. SCHLAUDER, Abbott Lab., North Chicago, Ill.

Hepatitis D Update  
JOHN L. GERIN, Georgetown Univ., Rockville, Md.

THURSDAY

Hepatitis E Update

GREGORY REYES and GEORGE J. DAWSON, Gene'abs,  
Redwood City, Calif., and Abbott Lab., North Chicago, Ill.

Hepatitis F

DANIEL W. BRADLEY, CDC, Atlanta, Ga.

**Session 87 (H). Seminar**

(Eligible for continuing education credit)

**DNA RECOMBINATION: BIOLOGY AND  
BIOCHEMISTRY**

Thursday, 8:30 A.M., Room 43

*Convenors:* NANCY L. CRAIG, Johns Hopkins Sch. of Med.,  
Baltimore, Md., and REID C. JOHNSON, UCLA Sch. of  
Med., Los Angeles, Calif.

*dif*, a *recA*-Independent Recombination Site in the Terminus  
Region

PETER L. KUEMPEL, Univ. of Colorado, Boulder

The Mechanism of Hin Recombination

REID C. JOHNSON, UCLA Sch. of Med., Los Angeles, Calif.

Tn7: Target Site-Specific Transposon

NANCY L. CRAIG, Johns Hopkins Sch. of Med., Baltimore,  
Md.

Human Immunodeficiency Virus DNA Integration

FREDERIC BUSHMAN, NIH, Bethesda, Md.

In Vitro Studies on the Mu DNA Strand Transfer Reaction

GEORGE CHACONAS, Univ. of Western Ontario, London,  
Ontario, Canada

**Session 88 (R). Seminar**

(Eligible for continuing education credit)

**EXPERIMENTAL STUDIES IN POPULATION  
GENETICS AND EVOLUTION**

Thursday, 8:30 A.M., Room 37

*Convenors:* DANIEL E. DYKHUIZEN, Univ. of Stony Brook,  
Stony Brook, N.Y., and LIN CHAO, Univ. of Maryland,  
College Park

Metabolic Basis of Natural Selection: a *lac* of Hyperbole

ANTHONY M. DEAN, Chicago Med. Sch., North Chicago,  
Ill.

Development and Maintenance of Polymorphisms in Populations  
of Microorganisms Evolving in a Simple Unstructured  
Environment

JULIAN P. ADAMS, Univ. of Michigan, Ann Arbor

DNA Damage and Evolution of Sex in Bacteria

JUDITH MONGOLD, Univ. of Massachusetts, Amherst

Evolution of Sex in RNA Viruses

LIN CHAO, Univ. of Maryland, College Park

**Session 89 (M). Seminar**

(Eligible for continuing education credit)

**ANALYSIS OF PROKARYOTIC GENOMES**

Thursday, 8:30 A.M., Room 39

*Convenors:* JAMES R. LUPSKI, Baylor Col. of Med., Houston,  
Tex., and GEORGE WEINSTOCK, Univ. of Texas Med.  
Sch., Houston

Informatic Analysis of the *Escherichia coli* Genome

KENNETH RUDD, NIH, Bethesda, Md.

Transposon- and Polymerase Chain Reaction-Based Sequencing  
Methods

DOUGLAS BERG, Washington Univ., St. Louis, Mo.

Bacterial Genomes: Mapping and Stability

GEORGE WEINSTOCK, Univ. of Texas Med. Sch., Houston

Distribution of Repetitive Sequences in Eubacteria and Applica-  
tion to Fingerprinting of Bacterial Genomes

JAMES R. LUPSKI, Baylor Col. of Med., Houston, Tex.

High Specificity, Semisynthetic, Site-Specific DNA Cleavage  
Agent: Application to Genome Analysis

RICHARD EBRIGHT, Waksman Inst., Rutgers Univ., New  
Brunswick, N.J.

Sequencing of Large Genomes without Conventional Cloning

WACLAW SZYBALSKI, Univ. of Wisconsin, Madison

**Session 90 (K). Seminar**

(Eligible for continuing education credit)

**DIAZOTROPHIC SYMBIONTS: GENETICS  
AND METABOLISM**

Thursday, 8:30 A.M., Room 41

*Convenors:* JAIME MORA, Ctr. de Investigacion sobre Fijacion  
de Nitrogeno, Cuernavaca, Mor., Mexico, and JUDY D.  
WALL, Univ. of Missouri, Columbia

**Divisional Lecture**

Structure and Dynamics of the *Rhizobium* Genome

RAFAEL PALACIOS, Ctr. de Investigacion sobre Fijacion de  
Nitrogeno, Cuernavaca, Mor., Mexico

Signals and Circuits: Regulation of the *Rhizobium meliloti nod*  
Genes

SHARON LONG, Stanford Univ., Stanford, Calif.

Genetic Analyses of Nodule Invasion and Development

GRAHAM WALKER, MIT, Cambridge, Mass.

Nitrogen and Carbon Metabolism in Free-Living and Symbiotic  
Diazotrophs

JAIME MORA, Ctr. de Investigacion sobre Fijacion de  
Nitrogeno, Cuernavaca, Mor., Mexico

Nitrogen Fixation in Association with Gramineae

JOHANNA DOBEREINER, EMBRAPA, Programa Nacion-  
al de Pesquisa em Biol. de Solo, Rio de Janeiro, Brazil

**MICROBIOLOGY EDUCATION: ELEMENTARY SCHOOL THROUGH COLLEGE**
**Thursday, 8:30 A.M., Room 103**

*Moderators:* LYNNE SECHRIST, SUNY at Potsdam, Potsdam, N.Y., and WILLIAM H. COLEMAN, Univ. of Hartford, West Hartford, Conn.

**8:30 Education Lecture**  
(Eligible for continuing education credit)

The Art of Biography and the Science of Microbiology  
JOAN BENNETT, Tulane Univ., New Orleans, La.

**9:30**

**BET1.** Designing Ability-Level-Specific Programs To Spark Interest in Microbiology. L. LAATSCH. Marquette Univ., Milwaukee, Wis.

**BET2.** A Science Consortium: a Local Academic Alliance Including Microbiology. K. ANDERSON,\* T. VASQUEZ, and A. GOMBAR. California State Univ., Los Angeles, and Los Angeles Unified School District, Los Angeles, Calif.

**BET3.** Strategies for Establishing Interactions between Industry and Schools. J. FULGINITI,\* D. MADORE, B. NORTON, and J. HOPKINS. Praxis Biologics, Rochester, N.Y.

**BET4.** Creating Barcode Videodisc Programs for Use in Microbiology Curricula. P. G. ENGELKIRK\* and J. L. DUBEN-ENGELKIRK. Sch. of Allied Health Sci., Univ. of Texas Health Sci. Ctr., Houston.

**10:30**

**BET5.** Microbiology Laboratory Education in The Netherlands. L. DYKSHOORN\* and E. VASBINDER. Higher Laboratory Education Delft, Hogeschool Rotterdam and Omstreken, The Netherlands.

**BET6.** Strategies for the Advancement of Microbiology and Biotechnology in Latin America by Using Innovative Instructional Approaches and Materials. L. A. SALICRUP,\* C. OCAMPO, and E. HODSON-JARAMILLO. Rutgers Univ., New Brunswick, N.J., and Univ. Javeriana, Bogotá, Colombia.

**BET7.** Test Scores Are Improved by Changing Initial Answers on Answer Sheets and on Test Pages Used as Optional Worksheets. F. WHITEHOUSE, JR.,\* and W. K. DAVIS. Univ. of Michigan, Ann Arbor.

**BET8.** Writing as a Basis for Scientific Inquiry and Research: Medical Microbiology as an Undergraduate Writing Intensive Course. W. H. COLEMAN\* and B. EMMEL. Dept. of Biol. and Dept. of English, University of Hartford, West Hartford, Conn.

**11:30**

**BET9.** "Outcomes Assessment" in a Microbiology Department: Paradigm for Surviving Accreditation. D. K. BRANNAN. Abilene Christian Univ., Abilene, Tex.

**DEFENSE AGAINST FUNGAL INFECTIONS**
**Thursday, 8:30 A.M., Room 21**

*Moderators:* ALAN M. SUGAR, Boston Univ. Med. Sch., Boston, Mass., and ELIAS ANAÏSSIE, M.D. Anderson Hosp. and Tumor Inst., Houston, Tex.

**8:30**

**F33.** Macrophage Activation by a Cell Wall Extract of *Candida albicans*. N. VAZQUEZ,\* D. M. MOSSER, H. R. BUCKLEY, K. J. BLANK, and T. J. ROGERS. Temple Univ. Sch. of Med., Philadelphia, Pa.

**F34.** Aberrant Membrane Proliferation in the Cytoplasm of *Candida albicans* Cells during Fungistasis Caused by Activated Macrophages. T. HASHIMOTO\* and R. C. MOCK. Dept. of Microbiol. and Immunology, Loyola Univ., Stritch Sch. of Med., Maywood, Ill.

**F35.** Phagocytosis of Blastocystidia by Human Polymorphonuclear Leukocytes. C. A. LYMAN\* and T. J. WALSH. Nat. Cancer Inst., Bethesda, Md.

**F36.** Growth Inhibition of *Candida albicans* by Interleukin-2-Activated Lymphocytes. H. L. MATHEWS. Loyola Univ. of Chicago, Maywood, Ill.

**9:30**

**F37.** Poly I:C Enhances Susceptibility of SCID Mice to Candidiasis. J. JENSEN,\* A. VAZQUEZ-TORRES, and E. BALISH. Univ. of Wisconsin Med. Sch., Madison.

**F38.** Immunoglobulin G Antibody Response to *Candida albicans* Acid Proteinase in Human Systemic Candidiasis and Candida Septicemia by Enzyme Immunoassay. T. L. RAY\* and C. D. PAYNE. Dept. of Dermatology, Univ. of Iowa Col. of Med., Iowa City.

**F39.** Gamma Interferon Cooperates with Lipopolysaccharide Tumor Necrosis Factor Alpha To Activate Mouse Splenic Macrophages to an Antihistoplasma State. T. E. LANE,\* B. A. WU-HSIEH, and D. H. HOWARD. Dept. of Microbiol. and Immunology, UCLA, Los Angeles, Calif.

**F40.** Fungistatic Activity of Human Neutrophils against *Histoplasma capsulatum* Yeasts Is Mediated by an Oxygen-Independent Mechanism(s). S. NEWMAN\* and L. GOOTEE. Univ. of Cincinnati Med. Ctr., Cincinnati, Ohio.

**10:30**

**F41.** De Novo Protein Synthesis by *Histoplasma capsulatum* after Ingestion by Macrophages. K. KAMEI,\* E. BRUMMER, K. CLEMONS, and D. A. STEVENS. Santa Clara Valley Med. Ctr., California Inst. for Med. Res., San Jose, and Stanford Univ., Stanford, Calif.

**F42.** A Calcium-Binding Protein Is a Major Released Product of *Histoplasma capsulatum* Yeasts. J. L. WEST,\* T. K. VANHEYNINGEN, G. S. DEEPE, and W. E. GOLDMAN. Washington Univ. Sch. of Med., St. Louis, Mo.

**F43.** Genetic Analysis of a *Pneumocystis carinii* 45-55-kDa Antigen. A. G. SMULIAN,\* P. D. WALZER, M. J. LINKE, and J. R. STRINGER. Univ. of Cincinnati Col. of Med., Cincinnati, Ohio.

**F44.** Effect of Sublethal Infection of Mice with *Aspergillus fumigatus* on Phagocytosis and Killing of Conidia and Hyphae by Splenic or Peritoneal Macrophages. E. MICHAÏSZYN, M. BOUSHIRA, N. GENDRON, S. SENECHAL, and L. DE

**THURSDAY**

CHEMOTAXIS AND MOTILITY

Session 93 (L). Seminar

(Eligible for continuing education credit)

THE CONCEPT OF STERILIZATION:  
VARYING DEFINITIONS AND RISKS

Thursday, 8:30 A.M., Room 27

Convenors: MARTIN S. FAVERO and WILLIAM R. JARVIS,  
CDC, Atlanta, Ga.

Development of Sterility Assurance Levels (SALs) in the Medical  
Device Industry

ROBERT F. MORRISSEY, Johnson and Johnson, New  
Brunswick, N.J.

The Role of Medical Devices in Nosocomial Infections

WILLIAM R. JARVIS, CDC, Atlanta, Ga.

Sterility Assurance Levels Applied to Transplantable Tissues

CARL W. BRUCH, St. Jude Hosp., St. Paul, Minn.

The Sterilization Double Standard between Industry and Health  
Care Facilities

MARTIN S. FAVERO, CDC, Atlanta, Ga.

Harmonization of European and United States Requirements  
Affecting SALs

PHILIP LEGLISE, Becton Dickinson Europe, Meylan Cedex,  
France

Session 94 (D). Seminar

(Eligible for continuing education credit)

WHAT IS THE SIGNIFICANCE OF  
SALMONELLA, LISTERIA, AND  
CAMPYLOBACTER IN FOODS?

Thursday, 8:30 A.M., Room 85

Convenors: MORRIS POTTER, CDC, Atlanta, Ga., and NOR-  
MAN J. STERN, USDA Agricultural Res. Service, Athens,  
Ga.

What Is Epidemiology and Why Is It Important?

RICHARD DICKER, CDC, Atlanta, Ga.

Epidemiology of *Salmonella*

ROBERT TAUXE, CDC, Atlanta, Ga.

Epidemiology of *Listeria*

JAY D. WENGER, CDC, Atlanta, Ga.

Epidemiology of *Campylobacter*

GEORG KAPPERUD, Nat. Inst. of Publ. Health, Oslo,  
Norway

Epidemiology and Microbiology in Science Policy

GAIL CASSELL, Univ. of Alabama, Birmingham

Thursday, 8:30 A.M., Room 36

Moderators: J. C. ENSIGN, Univ. of Wisconsin, Madison, and  
M. S. JOHNSON, Loma Linda Univ., Loma Linda, Calif.

8:30

I35. Novel Aerotaxis Mechanism in *Bacillus subtilis*. L. S.  
WONG, R. K. MARRACINO, J. LIN, M. S. JOHNSON,  
and B. L. TAYLOR.\* Sch. of Medicine, Loma Linda Univ.,  
Loma Linda, Calif.

I36. Motile Spores of Actinoplanetes: Comparison of Flagellar  
Proteins and Germination of *Dactylosporangium aurantiacum*  
and *Actinoplanes rectilineatus*. N. VESSELINOVA\* and J. C.  
ENSIGN, Univ. of Wisconsin, Madison.

I37. Calcium Ions and *Escherichia coli* Chemotaxis. L. S. TISA\*  
and J. ADLER, Univ. of Wisconsin, Madison.

I38. Export and Assembly of the Flagellar Hook Protein of  
*Caulobacter crescentus*. M. G. KORNACKER\* and A. NEW-  
TON, Princeton Univ., Princeton, N.J.

9:30

I39. Characterization of the *Pseudomonas aeruginosa pilT* Locus  
Involved in Pilus Retraction and Twitching Motility. P.  
TRUAX and A. DARZINS.\* Dept. of Microbiol., Ohio State  
Univ., Columbus.

I40. The Periplasmic Flagella of *Borrelia burgdorferi* Do Not  
Undergo Helical Transformation at Low pH. J. A. KREIL-  
ING\* and N. W. CHARON, West Virginia Univ., Morgantown.

I41. Chemotaxis of *Xanthobacter* sp. Strain JW-KR2 towards  
Alcohols. H. K. REDING, Univ. of Georgia, Athens.

I42. Relationship between Chemotaxis Behavior and Swarmer  
Cell Differentiation in *Vibrio parahaemolyticus*. M. T. MONT-  
GOMERY\* and M. R. BELAS, Ctr. of Marine Biotechnology,  
Univ. of Maryland System, Baltimore.

10:30

I43. Presence of Chemotactic Receptors in Chemolithotrophic  
Acidophilic Bacteria. J. ROJAS, J. ACUNA, and C. A.  
JEREZ.\* Univ. de Chile, Santiago, Chile.

Session 96 (T, S). Seminar

(Eligible for continuing education credit)

DISCOVERY AND APPLICATIONS OF VIRAL  
RNA PACKAGING SIGNALS

Thursday, 8:30 A.M., Room 93

Convenors: MARY ESTES, Baylor Col. of Medicine, Houston,  
Tex., and REED WICKNER, NIH, Bethesda, Md.

Assembly of the L-A Double-Stranded RNA Virus of *Saccharo-  
myces cerevisiae*: the Packaging Signal and the Packaging  
Protein

REED WICKNER, NIH, Bethesda, Md.

Identification and Analysis of a Coronavirus Packaging Signal  
SHINJI MAKINO, Univ. of Texas, Austin

Specific Interactions between Sindbis Virus RNAs and the Viral Capsid Protein  
BARBARA WEISS, Washington Univ. Sch. of Med., St. Louis, Mo.

Retroviral Packaging: In Vitro Assays with Human Immunodeficiency Virus Type 1  
JEREMY LUBAN, Columbia Univ. Sch. of Med., New York, N.Y.

### Session 97 (B)

## PATHOGENIC NEISSERIA

Thursday, 8:30 A.M., Room 1

*Moderators:* H. S. SEIFERT, Northwestern Univ., Chicago, Ill., and D. W. DYER, SUNY at Buffalo, Buffalo, N.Y.

8:30

**B93.** Assays To Monitor Pilin Recombination in *Neisseria gonorrhoeae*. L. A. WAINWRIGHT, K. E. HOIKKA, and H. S. SEIFERT.\* Northwestern Univ. Med. School, Chicago, Ill.

**B94.** Reversible Phase Variation of Gonococcal Pili by On-Off Switch of the Pilus Assembly Protein PilC and Its Effect on Interactions with Epithelial Cells. A.-B. JONSSON,\* D. ILVER, J. PFEIFER, and S. NORMARK. Dept. of Molecular Microbiol., Washington Univ., St. Louis, Mo.

**B95.** Selection for Nonpilated Variants of *Neisseria gonorrhoeae* during Passage through Epithelial Cells. D. ILVER,\* A.-B. JONSSON, and S. NORMARK. Washington Univ., St. Louis, Mo.

**B96.** Gonococcal Attachment to Human Leukocytes Is Enhanced by Complement C1q. S. NOWICKI\* and M. MARTENS. Univ. of Texas Med. Branch, Galveston.

9:30

**B97.** Identification of a *Neisseria gonorrhoeae* Adhesin Gene. R. AJIOKA, D. PUAOI,\* V. HWA, and M. SO. Oregon Health Sci. Univ., Portland.

**B98.** *Escherichia coli* Expressing a *Neisseria gonorrhoeae* Opa Protein Invades Cultured Human Epithelial Cells. D. SIMON\* and R. F. REST. Hahnemann Univ. Sch. of Med., Philadelphia, Pa.

**B99.** Studies on Removal of Iron from Human Transferrin by *Neisseria meningitidis*. M. L. NIEBAUER,\* P. M. WAGNER, and D. W. DYER. SUNY at Buffalo, Buffalo, N.Y.

**B100.** Fbp Has a Central Role as a Periplasmic Binding Protein in Iron Acquisition by Pathogenic *Neisseria* spp. C.-Y. CHEN, S. A. BERISH, M. E. WEST, S. A. MORSE, and T. A. MIETZNER.\* CDC, Atlanta, Ga., and Univ. of Pittsburgh Sch. of Med., Pittsburgh, Pa.

10:30

**B101.** Anaerobic Growth Increases Sialyltransferase Activity of *Neisseria gonorrhoeae*. J. V. FRANGIPANE\* and R. F. REST. Hahnemann Univ. Sch. of Med., Philadelphia, Pa.

**B102.** Meningococci Make Different Lipooligosaccharides as They Grow and Divide: Analysis of Single Cells by Fluorescence-Activated Cell Sorting. M. ESTABROOK,\* W. C. HYUN, and J. M. GRIFFISS. Univ. of California, San Francisco.

**B103.** Molecular and Genetic Analysis of Lipooligosaccharide Biosynthesis in *Neisseria gonorrhoeae*. R. C. SANDLIN,\* M. A. APICELLA, and D. C. STEIN. Univ. of Maryland, College Park, and SUNY, Buffalo, N.Y.

### Session 98 (U). Seminar

(Eligible for continuing education credit)

## IMMUNOPATHOGENESIS OF MYCOBACTERIUM AVIUM COMPLEX DISEASE

Thursday, 8:30 A.M., Room 80

*Convenors:* PATTISAPU R. J. GANGADHARAM, Univ. of Illinois Sch. of Med., Chicago, and JOSEPH FALKINHAM, Virginia Polytechnic Inst. and State Univ., Blacksburg

Transposable Genetic Elements and Opaque and Transparent Colony Variants of *Mycobacterium avium* Complex  
JOSEPH O. FALKINHAM III, Virginia Polytechnic Inst. and State Univ., Blacksburg

Pathobiological Significance of Colony Morphology of *Mycobacterium avium* Complex  
M. VENKATA REDDY, Univ. of Illinois Sch. of Med., Chicago

*Mycobacterium avium* Surface Antigens: Biomedical and Genetic Analysis of Their Synthesis  
JOHN T. BELISLE, Colorado State Univ., Fort Collins

Host Factors in the Pathogenesis of *Mycobacterium avium* Complex Disease  
PATTISAPU R. J. GANGADHARAM, Univ. of Illinois Sch. of Med., Chicago

Role of Lymphokine-Activated Killer Cells in the Pathogenesis of *Mycobacterium avium* Complex Disease  
D. KAY BLANCHARD, Univ. of South Florida, Tampa

### Session 99 (G). Seminar

(Eligible for continuing education credit)

## MYCOPLASMAS IN VETERINARY MEDICINE

Thursday, 8:30 A.M., Room 19

*Convenors:* MARY B. BROWN, Univ. of Florida, Gainesville, and MARY C. DEBEY, Iowa State Univ., Ames

Capsular Polysaccharide of *Mycoplasma dispar* and Its Role as a Virulence Determinant in Bovine Pneumonia  
RICARDO ROSENBUSCH, Iowa State Univ., Ames



Association of Mycoplasma with Upper Respiratory Disease in an Endangered Species, the Desert Tortoise  
MARY B. BROWN, Univ. of Florida, Gainesville

Genomic Variability in Porcine Mycoplasmas  
MARK MCINTOSH, Univ. of Missouri, Columbia

Pathogenic Mechanisms of *Mycoplasma hyopneumoniae* in Swine  
MARY C. DEBEY, Iowa State Univ., Ames

Genital Mycoplasmosis in Sprague-Dawley Rats  
DONNA A. STEINER, Univ. of Florida, Gainesville

### Session 100 (N)

#### MICROBIAL ECOLOGY: GROUNDWATER AND SUBSURFACE

Thursday, 8:30 A.M., Room 33

*Moderators:* AARON L. MILLS, Univ. of Virginia, Charlottesville, and WILLIAM F. GUERIN, Michigan State Univ., E. Lansing

8:30 Divisional Lecture  
(Eligible for continuing education credit)

Advances in Microbial Ecology  
JAMES TIEDJE, Michigan State Univ., E. Lansing

9:30

N18. Phylogenetic Analysis of "Arthrobacter-Like" Isolates from the Deep Subsurface. J. R. REEVES, D. L. BALKWILL, and R. H. REEVES.\* Florida State Univ., Tallahassee.

N19. Evidence for Eubacterial DNA in Central Texas Aquifers. M. J. DAVIES,\* J. W. AMMERMAN, E. L. GROSSMAN, and M. J. BEIFUSS. Texas A&M Univ., College Station.

N20. Responses of Subsurface Microorganisms to Starvation and Desiccation in Porous Media. T. L. KIEFT,\* L. L. ROSACKER, and D. B. RINGELBERG. New Mexico Inst. of Mining and Technology, Socorro, and Univ. of Tennessee, Knoxville.

N21. Utilization of Various Naturally Occurring Aromatic Compounds by Groundwater Microorganisms. J. E. WEAR,\* C. J. BERRY, M. M. FRANCK, and A. E. PHILLIPS. Wake Forest Univ., Winston-Salem, N.C., and Savannah River Lab., Aiken, S.C.

10:30

N22. Role of Bacterial Attachment and Chemotaxis in the Efficiency of Soil-Sorbed Naphthalene Utilization. W. F. GUERIN\* and S. A. BOYD. Michigan State Univ., East Lansing.

N23. Stimulation of Microbial Communities in Groundwater from Horizontal Well In Situ Air Stripping at a Chlorinated Solvent-Contaminated Site. T. C. HAZEN,\* J. M. DOUGHERTY, and B. B. LOONEY. Westinghouse Savannah River Co., Savannah River Lab., Aiken, S.C.

N24. Characterization of the Subsurface Microbial Community from a Trichloroethylene-Contaminated Site. J. M. DOUGHERTY,\* M. M. FRANCK, C. B. FLIERMANS, and T. C. HAZEN. Savannah River Lab., Aiken, S.C.

N25. Effects of Trichloroethylene, Tetrachloroethylene, and Methane Exposure on Microbial Community Dynamics in a

Sediment Column. M. V. ENZIEN,\* F. W. PICARDAL, T. C. HAZEN, and R. G. ARNOLD. Savannah River Lab., Aiken, S.C., and Univ. of Arizona, Tucson.

11:30

N26. Movement of Bacteria in Porous Media Containing Preferred Flow Paths. A. L. MILLS,\* G. M. HORNBERGER, and J. S. HERMAN. Univ. of Virginia, Charlottesville.

### Session 101 (Committee on International Activities, PSAB). Round Table (Eligible for continuing education credit)

#### MOLECULAR BIOLOGY AND BIOCHEMISTRY OF ACIDOPHILIC CHEMOLITHOTROPHS: APPLICATIONS ON BACTERIAL LEACHING OF ORES

Thursday, 8:30 A.M., Room 95

*Convenors:* CARLOS A. JEREZ, Univ. de Chile, Casilla, Chile, and EMILIO GARCIA, Lawrence Livermore Nat. Lab., Livermore, Calif.

Bacterial leaching is a process by which acidophilic microorganisms dissolve refractory sulfide ores to release their mineral content as an effluent. This biodegradation of ores is of great industrial importance since it may contribute about 10% to yearly world copper production, and it is also important for the recovery of gold, uranium, and other metals. This biological process is preferred since it can be applied to low- or high-grade ores, it has lower adverse environmental effects compared to smelting, and it generally has a lower cost.

In recent years, successful pilot plants have been set up in a number of countries, such as Brazil, Canada, Chile, Mexico, Peru, the Soviet Union, South Africa, and the United States. Although bacterial leaching occurs naturally, researchers are currently examining ways to optimize this process. This can be done by identifying the bacteria best suited to each biomining process and the conditions needed for optimum leaching such as acidity, temperature, and nutrient requirements. The specific topics covered during this round table will include the role played by different chemolithotrophs in the bioleaching processes and some of the present approaches to study gene expression and to develop genetic systems for future improvement of the acidophiles involved by genetic manipulation.

*Participants:* DAVID HOLMES, OMAR ORELLANA, F. F. ROBERTO, ROBERT BLAKE II, and OLLI H. TUOVINEN

### Session 102 (U)

#### MYCOBACTERIAL GENES AND GENE PRODUCTS AND THEIR ROLES IN PATHOGENESIS

Thursday, 8:30 A.M., Room 97

*Moderators:* WILLIAM R. JACOBS, JR., Howard Hughes Med. Inst., Albert Einstein Col. of Med., Bronx, N.Y., and DIANA

**MICROBIAL CULTURE PRODUCTS FOR ENVIRONMENTAL APPLICATIONS: SNAKE OIL OR SCIENCE?**

8:30

- U12. Cloning and Sequencing of the Catalase-Peroxidase Gene of *Mycobacterium tuberculosis*. F. LARAQUE,\* G. BOMFIM, and L. W. RILEY. Cornell Med. Col., New York, N.Y.
- U13. Nucleotide Sequence Analysis and Expression of a Gene Encoding a *Mycobacterium intracellulare* Peroxidase-Catalase. S. MORRIS,\* J. NAIR, and D. ROUSE. Ctr. for Biologics Evaluation and Res., FDA, Bethesda, Md.
- U14. Sequence Analysis and Expression of Two *Mycobacterium leprae* Genes. J. POPOWSKI,\* S. SELA, and J. E. CLARK-CURTISS. Washington Univ., St. Louis, Mo.
- U15. The Inducible Acetamidase Gene of *Mycobacterium smegmatis*. T. PARISH,\* P. DRAPER, and M. J. COLSTON. Nat. Inst. Med. Res., London, U.K.

9:30

- U16. Isolation and Characterization of Recombinant Phagmids Expressing *Mycobacterium paratuberculosis* Antigens. F. A. EL-ZAATARI,\* C. Y. HACHEM, A-M. H. NGUYEN, and D. Y. GRAHAM. VA Med. Ctr. and Baylor Col. of Med., Houston, Tex.
- U17. Protein Splicing in the Maturation of *Mycobacterium tuberculosis* RecA Protein. E. O. DAVIS, S. G. SEDGWICK, and M. J. COLSTON.\* Nat. Inst. for Med. Res., The Ridgeway, Mill Hill, London, U.K.
- U18. Construction and Analysis of Lipoprotein Fusion Vectors for Acylation and Export of Heterologous Antigens in a Recombinant *Mycobacterium bovis* (Bacille Calmette-Guérin) BCG Live Vaccine Vehicle. M. HANSON,\* J. BURLEIN, and K. STOVER. MedImmune, Inc., Gaithersburg, Md.
- U19. Characterization of the Major Membrane-Associated Protein of Virulent *Mycobacterium tuberculosis*. B.-Y. LEE,\* S. A. HEFTA, and P. J. BRENNAN. Colorado State Univ., Ft. Collins, and City of Hope, Duarte, Calif.

10:30

- U20. Analysis of T-Cell Epitopes of the 19-kDa Antigens from *Mycobacterium intracellulare* and *Mycobacterium tuberculosis*. J. MACKALL,\* G. BAI, D. ROUSE, G. ARMOA, F. CHUIDIAN, J. NAIR, and S. MORRIS. Ctr. for Biologics Evaluation and Res., FDA, Bethesda, Md.
- U21. T- and B-Cell Response to the Major Secreted Antigen (Ag 85) from *Mycobacterium bovis* BCG in Leprosy. K. HUYGEN, P. LAUNOIS,\* J. DE BRUYN, A. DROWART, J. P. VAN VOOREN, M. N'DIAYE, B. DIOUF, J. L. SARTHOU, J. GRIMAUD, and J. MILLAN. Inst. Pasteur van Brabant and Hôpital Erasme (ULB), Brussels, Belgium, and Inst. Pasteur de Dakar, Dakar, Senegal.
- U22. Characterization of the Internalization of Bacillus Calmette-Guérin by Human Bladder Tumor Cells. K. KURODA, E. J. BROWN, W. B. TELLE, and T. L. RATLIFF.\* Toho Univ. Sch. of Med., Ohta-ku, Tokyo, Japan, and Washington Univ. Sch. of Med. and Jewish Hosp., St. Louis, Mo.
- U23. Isolation and Purification of a Highly Immunoreactive 50-kDa Protein from the Culture Filtrate of *Mycobacterium tuberculosis*. K. M. DOBOS,\* P. J. BRENNAN, and I. M. ORME. Dept. of Microbiol., Colorado State Univ., Fort Collins.

Thursday, 8:30 A.M., Room 82

Convenors: DENNIS RAY SCHNEIDER, Micro-Bac Internat., Austin, Tex., and SUE MARKLAND DAY, Univ. of Tennessee, Knoxville

Microbial culture products for use in remediating various types of industrial waste problems are meeting with increasing commercial success in a variety of areas. With the increased use of these products, a variety of issues have surfaced in regard to establishing scientific criteria for quality standards, marketing claims, and use protocols. The importance of setting standards for such products grows as a new industry establishes itself. Concerns of manufacturers and users of such products will be discussed along with possible actions to address such concerns.

Participants: A. ASHER, J. L. BRICE, L. DAVIS, S. M. DAY, S. JENSEN, and D. R. SCHNEIDER

**Session 104 (O)**

**NATURAL PRODUCT DISCOVERY: NEW LEADS AND METHODS**

Thursday, 8:30 A.M., Room 87

Moderators: L. HUANG, Merck & Co. Inc., Rahway, N.J., and LEO THOMPSON, Dupont Merck Pharmaceutical Co., Wilmington, Del.

8:30

- O1. Discovery of Zaragozaic Acids, Potent Inhibitors of Squalene Synthetases, from Filamentous Fungi. M. MEINZ,\* L. HUANG, C. DUFRESNE, F. VANMIDDLESWORTH, J. BERGSTROM, L. QUINN, M. MOJENA, Y. L. KONG, M. NALLIN, J. ONISHI, J. MILLIGAN, R. JENKINS, G. BILLS, M. M. KURTZ, D. REW, J. KARKAS, I. MARTIN, O. HENSENS, D. ZINK, and J. LIESCH. Merck Sharp & Dohme Res. Lab., Rahway, N.J.
- O2. Zaragozaic Acids A, B, and C: In Vitro Antifungal Activity and Mechanism of Action. J. A. MILLIGAN, J. C. ONISHI,\* K. BARTIZAL, J. CUROTTA, C. DOUGLAS, H. KROPP, M. KURTZ, J. MARRINAN, W. ROZDILSKY, M. J. SALVATORE, J. R. THOMPSON, and C. TRAINOR. Merck, Sharp & Dohme Res. Lab., Rahway, N.J.
- O3. Production of the Zaragozaic Acids by Filamentous Fungi: Identification and Fermentation of the Producing Organisms. M. NALLIN OMSTEAD,\* R. JENKINS, G. BILLS, F. PELAEZ, M. DIEZ, S. MORRISON, M. MEINZ, L. HUANG, and L. KAPLAN. Merck, Sharp & Dohme Res. Lab., Rahway, N.J., and Ctr. de Investigaciones Basicas de Espana, Madrid, Spain.
- O4. Discovery of Two New FK-506 Producers, *Actinoplanete* sp. and *Streptomyces* sp. L. HUANG, L. QUINN,\* S. LIN, F. DUMONT, S. STEVENS-MILES, G. SALITURO, Y. KONG, D. VILELLA, T. SEWELL, S. MORRISON, I.

MARTIN, J. LIESCH, G. KOCH, O. GENILLOU, J. SIGMUND, C. HIRSCH, M. NALLIN, M. DIEZ, S. MOCHALES, and G. GARRITY. Merck, Sharp & Dohme Res. Lab., Rahway, N.J., and Madrid, Spain.

9:30

- O5. Discovery of L-920,936, Cyclopeptides. Potent Antagonist of Endothelin Receptor, from *Microbiospora* sp. S. STEVENS-MILES,\* L. HUANG, D. WILLIAMS, Y. LAM, Y. L. KONG, M. SANCHEZ, K. JONES, S. MORRISON, I. MARTIN, O. HENSENS, D. ZINK, J. LIESCH, G. KOCH, O. GENILLOU, J. SIGMUND, C. HIRSCH, M. DIEZ, S. MOCHALES, M. GAGLIARDI, and G. GARRITY. Merck, Sharp & Dohme Res. Lab., Rahway, N.J., West Point, Pa., and Madrid, Spain.
- O6. Ligand Binding and Structural Studies of a Random Screened Peptide and Streptavidin. P. C. WEBER, L. D. THOMPSON,\* and M. W. PANTOLIANO. DuPont Merck Pharmaceutical Co., Wilmington, Del.
- O7. Isolation, Characterization, and Biotransformations of Forocidin I, Hydrolytic Product of Spiramycin. S. SHRIN-GARPURE,\* K. RAMU, S. COOPERWOOD, J. K. BAKER, and J. S. WILLIAMSON. Dept. of Med. Chemistry and Res. Inst. of Pharmaceutical Sci., Sch. of Pharmacy, Univ. of Mississippi, University.
- O8. Microbial Hydroxylation and Glycosylation of 13-Deoxy Ivermectin Aglycone. B. R. PETUCH,\* R. WHITE, T. CHEN, and B. ARISON. Merck, Sharp & Dohme Res. Lab., Rahway, N.J.

10:30

- O9. Microbial Transformation of Podophyllotoxin. P. K. CHEN,\* D. CHANDRASEKHARAN, A. TALEBIAN, and A. GHIORGHIS. Dept. of Biol. and Dept. of Chemistry, Georgetown Univ., Washington, D.C.
- O10. Role for Alanine in Ammonium Regulation of Cephamycin Biosynthesis in *Streptomyces clavuligerus*? S. KASARENI-NI\* and A. L. DEMAINE. MIT, Cambridge, Mass.

### Session 105 (K)

#### BACTERIAL TRANSPORT: ATPase, PTS, PERMEASES

Thursday, 8:30 A.M., Room 38

Moderators: ROBERT J. BROOKER, Univ. of Minnesota, St. Paul, and R. W. HUTKINS, Univ. of Nebraska, Lincoln

8:30

- K17. Galactose-Proton Symport Decreases Acidurance of *Streptococcus mutans* GS-5. W. A. BELLI\* and R. E. MARQUIS. Univ. of Rochester, Rochester, N.Y.
- K18. Cloning and Partial Characterization of the *Streptococcus thermophilus* 19258 *unc* Genes Encoding Proton-Translocating ATPase. R. DIAO\* and R. W. HUTKINS. Univ. of Nebraska, Lincoln.
- K19. Sodium as the Coupling Ion for the ATPase of *Acetobacterium woodii*. R. HEISE\* and V. MULLER. Inst. für Mikrobiologie, Göttingen, Germany.
- K20. Effects of Transcribing  $F_0$  Genes from the *lac* Promoter on the Synthesis and Assembly of  $F_0$ . R. A. MONTICELLO\* and

W. S. A. BRUSILOW. Dept. of Biochemistry, Wayne State Univ. Sch. of Med., Detroit, Mich.

9:30

- K21. A Cloned Gene from Alkaliphilic *Bacillus firmus* OF4 That Has Sequence Similarity to the *Staphylococcus aureus cadC* Gene Enhances the  $\text{Na}^+/\text{H}^+$  Antiporter Activity of *Escherichia coli* NM81. D. M. IVEY, A. A. GUFFANTI,\* and T. A. KRULWICH. Dept. of Biochemistry, Mount Sinai Med. Sch., New York, N.Y.
- K22. Identification of Lactose Permease Mutants Which Possess an Enhanced Ability To Transport Maltotriose and *p*-Nitrophenyl- $\alpha$ -Maltodextrins. S. G. OLSEN,\* K. GREENE, and R. J. BROOKER. Univ. of Minnesota, St. Paul.
- K23. The *corA* Magnesium Transport Sequences of *Salmonella typhimurium* and *Escherichia coli* Identify a New Class of Transport System. R. L. SMITH,\* J. L. BANKS, M. D. SNAVELY, and M. E. MAGUIRE. Dept. of Pharmacology, Sch. of Med., Case Western Reserve Univ., Cleveland, Ohio.
- K24. Characterization of Mannitol-Positive Mutants of an *Escherichia coli* K-12 Strain That Lacks a Functional Mannitol Phosphotransferase System. G. BEGLEY,\* M. DISMER, J. KAO, and G. JACOBSON. Boston Univ., Boston, Mass.

10:30

- K25. Primary Structure and Characteristics of the Melibiose Carrier of *Klebsiella pneumoniae*. H. HAMA,\* D. M. WILSON, and T. H. WILSON. Harvard Med. Sch., Boston, Mass.
- K26. Pentose Transport by the Ruminant Bacterium *Prevotella (Bacteroides) ruminicola*. H. J. STROBEL. Dept. of Animal Sci., Univ. of Kentucky, Lexington.
- K27. Molecular and Biochemical Characterization of *Salmonella typhimurium* Adenylate Kinase Mutants Sensitive to Glycine Betaine. J. A. GUTIERREZ\* and L. N. CSONKA. Purdue Univ., West Lafayette, Ind.
- K28. Transport of Glycine Betaine in the Extremely Haloalkaliphilic Phototrophic Sulfur Bacterium *Ectothiorhodospira halochloris*. P. PETERS\* and H. G. TRUPER. Univ. of Bonn, Inst. of Microbiol. and Biotechnology, Bonn, Germany.

### POSTER SESSIONS

Thursday, 9:00-10:30 A.M., Exhibit Hall C

(Board numbers in parentheses)

#### Session 106 (O). GENE CLONING AND EXPRESSION OF FERMENTATION ENZYMES

- O11. Nucleotide Sequence Analysis of the Genes for Anthranilate Synthetase in *Streptomyces venezuelae* ISP5230. (001) C. LIN,\* A. S. PARADKAR, and L. C. VINING. Dalhousie Univ., Halifax, Nova Scotia, Canada.
- O12. Cloning and Expression of *Streptomyces lavendulae* Mitomycin C Resistance Gene in *Streptomyces lividans* 1326. (003) P. R. AUGUST,\* M. C. FLICKINGER, and D. H. SHERMAN. Microbiol. Dept., Biochemistry Dept., and Biol. Process Technology Inst., Univ. of Minnesota, St. Paul.
- O13. *trans*-Complementation of Actinorhodin (*actI*) Mutants with Oxytetracycline and *whiE* Spore Pigment Biosynthetic Genes. (005) E.-S. KIM\* and D. H. SHERMAN. Inst. for Advanced Studies in Biol. Process Technology and Dept. of Microbiol., Univ. of Minnesota, St. Paul.
- O14. Use of an Avermectin Gene Cluster Probe To Isolate Genes Involved in Nemadectin Biosynthesis. (007) P. H. GIBBONS,\* D. J. MACNEIL, F. FOOR, K. M. GEWAIN, J.

- L. OCCI, and T. MACNEIL. Merck, Sharp & Dohme Res. Lab., Rahway, N.J.
- O15.** Production and Characterization of Antibodies against Norsolorinic Acid Reductase. (009) R. C. LEE, D. BHATNAGAR, T. E. CLEVELAND, and F. S. CHU.\* Food Res. Inst., Univ. of Wisconsin, Madison, and Southern Regional Res. Ed. Ctr., USDA, New Orleans, La.
- O16.** Expression of the *Escherichia coli*  $\beta$ -Glucuronidase Gene in *Aspergillus flavus*. (011) C. P. WOLOSHUK\* and G. A. PAYNE. North Carolina State Univ., Raleigh.
- O17.** Characterization and Chemical Activities of *Botrytis cinerea* Laccase. (013) D. SLOMCZYNSKI,\* J. P. NAKAS, and S. W. TANENBAUM. SUNY Col. of Environmental Sci. and Forestry, Syracuse, N.Y.
- O18.** Isolation and Analysis of Xylanase Genes from *Fibrobacter succinogenes* S85 and Their Expression in *Escherichia coli*. (015) C. W. FORSBERG,\* D. C. SMITH, L. M. MALBURG, P. WANG, H. E. SCHELLHORN, S. F. LEE, and J. GONG. Univ. of Guelph, Guelph, Ontario, Canada, and McMaster Univ., Hamilton, Ontario, Canada.
- O19.** Comparison of Thermostable Xylanases Having Optimal Activities at Acidic, Neutral, and Alkaline pH Values. (017) S. DE BLOIS\* and J. WIEGEL. Dept. of Microbiol. and Ctr. for Biol. Resource Recovery, Univ. of Georgia, Athens.
- O20.** Cloning and Characterization of an Endoglucanase and a Xylanase from the Hyperthermophilic Eubacterium *Thermotoga maritima*. (019) J. D. BOK,\* S. K. GOERS, and D. E. EVELEIGH. Rutgers Univ., New Brunswick, N.J.
- O21.** Cloning and Characterization of a Cellobiohydrolase from *Microbispora bispora* in *Escherichia coli* and *Streptomyces lividans*. (021) P. HU\* and T. CHASE, JR. Cook Col., Rutgers Univ., New Brunswick, N.J.
- O22.** Partial Purification of Cellulases by Preparative Native Gel Electrophoresis. (023) R. A. NIEVES,\* W. S. ADNEY, and M. E. HIMMEL. Biotechnology Res. Branch, Fuels & Chemicals Res. and Engineering Div., Nat. Renewable Energy Lab., Golden, Colo.
- O23.** Molecular Cloning of the Cellulase S<sub>5</sub> Gene of *Clostridium thermocellum*. (025) W. K. WANG,\* M.-T. HSU, K. KRUIUS, and J. H. D. WU. Univ. of Rochester, Rochester, N.Y.
- O24.** Characterization of Bgl 2, a Thermostable  $\beta$ -Glucosidase Cloned from *Microbispora bispora* and Expressed in *Escherichia coli*. (027) R. M. WRIGHT\* and A. K. GOYAL. Rutgers Univ., New Brunswick, N.J.
- O25.** Biochemical Characterization of the Lignin Peroxidase P3 from *Streptomyces viridosporus* T7A. (029) T. S. MAGNUSON\* and D. L. CRAWFORD. Univ. of Idaho, Moscow.
- O26.** Production of Alkaline Protease by Continuous Culture of *Bacillus licheniformis* MIR 29. (031) M. FERRERO,\* G. CASTRO, C. ABATE, and F. SINERIZ. PROIMI and Cat. Microbiol., UNT, Tucuman, Argentina.
- O27.** Invertase B from *Zymomonas mobilis*: Purification and Gene Cloning. (033) P. O'MULLAN\* and T. CHASE, JR. Rutgers Univ., New Brunswick, N.J.
- O28.** Cloning, Sequence Analysis, and Expression in *Escherichia coli* of a Cyclomaltodextrinase Gene from *Bacillus sphaericus*. (035) T. OGUMA,\* A. MATSUYAMA, M. KIKUCHI, and E. NAKANO. Noda Inst. for Sci. Res., Noda, Chiba, Japan; Univ. of British Columbia, Vancouver, British Columbia, Canada; and Res. and Development Div., Kikkoman Corp., Noda, Chiba, Japan.
- O29.** Purification and Characterization of an Endoxylanase from the Yeastlike Fungus *Aureobasidium pullulans* Y-2311-1. (037) Z. Q. ZHANG,\* X. L. LI, L. G. LJUNGDAHL, and K.-E.L. ERIKSSON. Dept. of Biochemistry and Ctr. for Biol. Resource Recovery, Univ. of Georgia, Athens.

- O30.** Activity of a Model Heterologous Protein in Proteinase Mutants of *Saccharomyces cerevisiae*. (039) J. M. WINGFIELD\* and J. R. DICKINSON. Univ. of Wales Col. of Cardiff, Cardiff, Wales.
- O31.** Cloning and Sequencing of an Exocellulase and a Protease Gene from *Thermomonospora fusca*. (041) G. LAO\* and D. B. WILSON. Cornell Univ., Ithaca, N.Y.
- O32.** A New Anaerobic Pathway for Succinate Degradation in *Clostridium kluyveri*. (043) R. A. WOLFF,\* G. URBEN, S. M. O'HERRIN, and W. R. KENEALY. Univ. of Wisconsin, Madison.

## Session 107 (N). MICROBIOLOGICAL WATER QUALITY

- N27.** Pathogenic Free-Living Amoebae in Recreational Freshwater in San Luis Potosí, México. (045) F. RIVERA, E. GALLEGOS,\* A. CALDERON, E. RAMIREZ, R. ORTIZ, and S. RODRIGUEZ. ENEP-I, UNAM, Mexico.
- N28.** Pathogenic Free-Living Amoebae in Thermal Water. (047) E. RAMIREZ,\* P. BONILLA, R. ORTIZ, S. RODRIGUEZ-ZARAGOZA, and D. HERNANDEZ. Project of Conservation and Improvement of Environment, UIICSE, ENEP-Iztacala, UNAM, Mexico.
- N29.** Plasmid Incidence in Bacteria Isolated from a Kraft Pulp Mill Treatment System. (049) R. R. FULTHORPE,\* S. LISS, and D. G. ALLEN. Univ. of Toronto, Ryerson Polytechnical Inst., Toronto, Ontario, Canada.
- N30.** Distribution and Bacterial Dynamics of a Sewage Plume in Antarctic Seawater. (051) J. P. HOWINGTON,\* G. A. MCFETERS, J. J. SMITH, and S. K. WATTERS. Microbiol. Dept., Montana State Univ., Bozeman.
- N31.** Examination of Source and Finished Waters of a Municipal Water Utility in Southern California for the Presence of *Legionella* Species. (053) C. PASZKO-KOLVA,\* M. H. STEWART, and R. L. WOLFE. Metropolitan Water District of Southern California, LaVerne.
- N32.** Survey of Water Quality at Various Springs on the Hopi Indian Reservation in Northeast Arizona. (055) P. M. JACOBY,\* T. M. BOWEN, and H. K. SPEIDEL. Northern Arizona Univ., Flagstaff.
- N33.** Seasonal Variation in Actinomycete Levels in a Water Reservoir and Treatment System. (057) M. LAMAGDELINE, D. OPHEIM,\* and D. SMITH. Quinnipiac Col., Hamden, Conn., and SCCRWA, New Haven, Conn.
- N34.** Algae in a Wastewater Biological Treatment System with an Organic Matter Overload. (059) G. VILA CLARA,\* A. LUGO, J. CURTS, M. CHAVEZ, and E. ROBLES. ENEP-Iztacala, UNAM, Mexico.
- N35.** Population Dynamics of Indicator Bacteria Associated with Combined Sewer Overflows and Bed Sediment in the Buffalo River, New York. (061) G. W. PETTIBONE\* and K. N. IRVINE. SUNY at Buffalo, Buffalo, N.Y.
- N36.** Determination of the Coliform Regrowth Potential in Southern California Drinking Water. (063) D. L. CLARK,\* D. J. REASONER, and B. H. OLSON. Univ. of California, Irvine, and U.S. EPA, Cincinnati, Ohio.
- N37.** Utilization of Organic N-Halamine Disinfectants against *Legionella pneumophila* and *Streptococcus faecalis*. (065) E. D. ELDER\* and J. C. REID. Georgia Southwestern Col., Americus.
- N38.** Evaluation of Filter Media and Filter Flow Rates on Assimilable Organic Carbon Reduction. (067) P. A. HACKER,\* C. PASZKO-KOLVA, M. H. STEWART, R. L. WOLFE, and E. G. MEANS. Metropolitan Water District of Southern California, La Verne.

- N39.** Production of Trihalomethanes and Other Disinfection By-Products Upon the Chlorination of Pure Cultures of Fungi and Bacteria. (069) G. I. RAMIREZ-TORO,\* H. A. MINNIGH, W. D. ROSENZWEIG, and W. O. PIPES. Drexel Univ., Philadelphia, Pa., and West Chester Univ., West Chester, Pa.
- N40.** Effects of Temperature on Wastewater Isolate Inhibition of Selected Pathogenic and Indicator Organisms. (071) C. A. ENOS,\* K. J. BRENNEMAN, and H. K. SPEIDEL. Northern Arizona Univ., Flagstaff.
- N41.** Application of Oligonucleotide Probes To Distinguish *Escherichia coli* Strains from Human and Animal Origins. (073) R. K. OSHIRO,\* Y.-L. TSAI, D. J. MIN, and B. H. OLSON. Univ. of California, Irvine, and County Sanitation Districts of Orange County, Fountain Valley, Calif.
- N42.** Coliphages and Their Use as Indicators of Sewage Pollution in Tropical Areas. (075) E. A. HERNANDEZ-DELGADO\* and M. GIL DE RUBIO. Dept. of Biol., Univ. of Puerto Rico, Río Piedras, Puerto Rico.
- N43.** Use of a Rapid Microscopic Method for Control of Sulfate-Reducing Bacteria in Irvine Ranch Water District Well Water. (077) D. L. MURPHY\* and B. H. OLSON. Univ. of California, Irvine.
- N44.** Chemical Performance Evaluation of Compact Ultrapure Water Systems. (079) C. J. REED,\* B. M. KAYLOR, A. K. HIGHSMITH, and E. W. ADES. CDC, Atlanta, Ga.
- N45.** Performance Evaluation of the New Colilert-MW System in Southern California Ocean Waters. (081) C. J. PALMER,\* C. D. MCGEE, Y.-L. TSAI, and L. C. SANGERMANO. County Sanitation Districts of Orange County, Fountain Valley, Calif.
- N46.** Improved Recovery of Chlorine-Injured *Escherichia coli* on Acidified Media: Colitag-2, E, and mCT2. (083) G. CHANG and R. A. LUM.\* Univ. of California, Berkeley.
- N47.** INDEC Medium: Omission of Lactose from the U.S. EPA-Promulgated EC + MUG Medium Gives Both an Indole and an Improved MUG Test. (085) G. W. CHANG,\* M. LANGER, and J. LEUNG. Univ. of California, Berkeley.

### Session 108 (H). GLOBAL REGULATION: CARBON, NITROGEN, AND IRON

- H131.** Identification and Characterization of a Carbon-Starvation-Inducible Gene in *Escherichia coli*. (087) D. M. ALEXANDER\* and A. C. ST. JOHN. Rutgers Univ., Piscataway, N.J.
- H132.** Genes and Sites That Regulate Nucleoside and Sugar Utilization in *Escherichia coli*. (089) I. BRIKUN,\* A. MIRONOV, and D. E. BERG. Dept. of Molecular Microbiol., Washington Univ. Med. Sch., St. Louis, Mo., and Inst. of Genetics and Selection Industrial Microorganisms, Moscow, Russia.
- H133.** Metabolite-Mediated Regulation of Adenylate Cyclase and Cyclic AMP Levels in *Escherichia coli* K-12. (091) L. ESTIME,\* C. PAYNE, A. C. WILLIAMS, and A. L. WILLIAMS. Howard Univ., Washington, D.C.
- H134.** Cyclic AMP-Dependent Expression of the Mixed-Function *serC-aroA* Operon from *Escherichia coli*. (093) C.-J. LIM,\* H. HWANG, H.-B. LEE, and E.-H. PARK. Kangweon Nat. Univ., and Sookmyung Women's Univ., Seoul, Korea.
- H135.** The Signal for Glucose Repression of the Lactose-Galactose Regulon Is Amplified Through Subtle Modulation of Transcription of the *Kluyveromyces lactis* *GAL4* Positive Activator Gene. (095) N. KUZHANDAIVELU,\* W. K. JONES, A. K. MARTIN, and R. C. DICKSON. Univ. of Kentucky, Lexington.

- H136.** Regulation of Expression of Genes Contributing to Virulence of *Streptococcus mutans*. (097) D. L. WEXLER\* and R. A. BURNE. Univ. of Rochester Med. Ctr., Rochester, N.Y.
- H137.** Cloning and Expression of the *Azotobacter salinestris* Polyphenol Oxidase Gene in *Escherichia coli*. (099) S. SHIVPRASAD\* and W. J. PAGE. Dept. of Microbiol., Univ. of Alberta, Edmonton, Alberta, Canada.
- H138.** Cloning and Partial Sequence of the Genomic Region Containing a Tungstate-Tolerance Mutation in *Azotobacter vinelandii* CA6. (101) S. C. RICKE,\* E. D. WOLFINGER, and P. E. BISHOP. Dept. of Microbiol. and USDA, Agricultural Res. Service, North Carolina State Univ., Raleigh.
- H139.** Molecular Genetics of Nitrate Assimilation in *Klebsiella pneumoniae* M5a1. (103) J. T. LIN,\* B. S. GOLDMAN, and V. STEWART. Cornell Univ., Ithaca, N.Y.
- H140.** Map Position of the *glnE* Gene in *Escherichia coli*. (105) W. B. MUSE\* and R. BENDER. Dept. of Biol., Univ. of Michigan, Ann Arbor.
- H141.** Cloning Genes Involved in Glutamate Biosynthesis from *Klebsiella aerogenes*. (107) P. POMPOSIELLO\* and R. A. BENDER. Univ. of Michigan, Ann Arbor.
- H142.** Regulation of the Gene Encoding 6-Phosphogluconate Dehydrogenase in *Anabaena* sp. Strain PCC 7120. (109) S. E. CURTIS,\* Y.-H. KIM, P. J. B. LIGON, and J. A. MARTIN. North Carolina State Univ., Raleigh.
- H143.** Cloning and Expression in *Escherichia coli* of *orf162*, a Gene from *Klebsiella pneumoniae* Encoding a Putative Negative Regulator of  $\sigma^{54}$ -Dependent Transcription. (111) G. BEGLEY and G. JACOBSON.\* Boston Univ., Boston, Mass.
- H144.** Transcriptional Regulation by Iron and Fur of *viuA*, the Gene Encoding the Vibriobactin Receptor of *Vibrio cholerae*. (113) J. R. BUTTERTON\* and S. B. CALDERWOOD. Massachusetts Gen. Hosp., Boston.

### Session 109 (L). EPIDEMIOLOGIC TYPING: MISCELLANEOUS NOSOCOMIAL INFECTIONS

- L11.** Comparison of Plasmid Profiles, Phage Typing, and Total Genomic Restriction (REA) Patterns for Analysis of Clonality of Methicillin-Resistant *Staphylococcus aureus* Isolates during Epidemiologic Investigation. (115) C. E. FASCHING,\* C. J. SHANHOLTZER, K. E. WILLARD, D. N. GERDING, and L. R. PETERSON. VA Med. Ctr. and Univ. of Minnesota, Minneapolis.
- L12.** Application of Pulsed-Field Electrophoresis as a Means of Typing Isolates of *Candida zeylanoides*. (117) M. H. GROSSERODE,\* R. J. HOLLIS, M. A. PFALLER, R. P. WENZEL, and H. D. ISENBERG. Univ. of Iowa, Iowa City; Oregon Health Sci. Univ., Portland; and Long Island Jewish Med. Ctr., New Hyde Park, N.Y.
- L13.** Evaluation of a Commercial DNA Purification System for Plasmid Analysis of Potential Nosocomial Bacterial Pathogens. (119) M. STEMPER, M. VANDERMAUSE, P. MITCHELL, and K. REED.\* Marshfield Med. Ctr. Lab., Marshfield, Wis.
- L14.** Immunoblot Typing of *Enterobacter* spp. Used to Examine Epidemiology and Development of Resistance. (121) M. MULLIGAN,\* K. SHIMODA, G. ORAKCILAR, R. WISHNOW, R. KWOK, and R. OELSCHLAEGER. VA Med. Ctr., Long Beach, Calif., and Univ. of California-Irvine, Orange.
- L15.** Identification of Plasmids in Whole-Cell Preparations Using Pulsed Field Electrophoresis. (123) C. L. DENTON\* and A. T. MCMANUS. U.S. Army Inst. of Surgical Res., Ft. Sam Houston, Tex.

- L16.** Frequency of *Pseudomonas aeruginosa* O-Serotypes Isolated in 1,640 Burn Admissions. (125) A. T. MCMANUS and C. H. GUYMON.\* U.S. Army Inst. of Surgical Res., Ft. Sam Houston, Tex.
- L17.** Antibiotic Resistance and Protein Profile Data Analysis of *Klebsiella pneumoniae* Strains Isolated from Elderly Community Home Residents. (127) T. MADHAVAN, L. SHI,\* T. GRUDZIEN, and S. WALIA. Oakland Univ., Rochester, Mich., and Providence Hosp., Southfield, Mich.
- L18.** Extracellular Enzyme Activity of Clinical and Environmental Strains of *Xanthomonas maltophilia*. (129) N. J. TODD, K. G. KERR,\* M. DENTON, and P. M. HAWKEY. Dept. of Microbiol., Leeds Univ., Leeds, U.K.
- L19.** Comparative Study of "Outbreak" and "Non-Outbreak" Strains of *Acinetobacter* from Several Countries Using a Variety of Typing Methods. (131) L. DIJKSHOORN, H. M. AUCKEN, J. GARAIZAR, P. GERNER-SMIDT, J. URSING,\* and T. L. PITT. Univ. Hosp., Rotterdam, The Netherlands; Ctr. Publ. Health Lab., London, U.K.; Statens Seruminstitut, Copenhagen, Denmark; and Malmö Gen. Hosp., Malmö, Sweden.
- L20.** Epidemiology of Nosocomial *Acinetobacter* in Southeast Michigan Hospitals. (133) L. M. DEMBRY,\* W. HAFEEZ, J. VAZQUEZ, S. DONABEDIAN, M. PERRI, J. E. PATTERSON, J. SOBEL, W. HIERHOLZER, C. PIERSON, M. SNYDER, R. BROWN, D. LEVINE, and M. J. ZERVOS. William Beaumont Hosp., Royal Oak, Mich.; Univ. of Michigan, Ann Arbor; Sinai Hosp. and Wayne State Univ., Detroit, Mich.; and Yale Univ., New Haven, Conn.
- L21.** Assessment of Long-Term Care Facility *Clostridium difficile* Carriage Rates and Risk Factors. (135) K. VANCE-BRYAN, J. MOODY, S. GILLILAND, K. WALKER, A. KRINKE, J. ROTSCHAFFER,\* and D. GUAY. St. Paul-Ramsey Med. Ctr., St. Paul, Minn.
- L22.** *Salmonella poona* Infection and Surveillance in a Neonatal Intensive Care Unit. (037) M. C. SHAFFER, A. STONE, and R. L. SAUTTER.\* Harrisburg Hosp., Harrisburg, Pa.
- L23.** Nasal Carriage of *Staphylococcus aureus* and Its Relationship to Postoperative Stereotomy Infections. (139) J. D. REID,\* B. W. HARMER, and J. L. WHITBY. Dept. of Microbiol., Univ. Hosp., London, Ontario, Canada.
- L24.** Hepatitis B Vaccination in Elderly Health Care Providers. (141) V. SPOTO,\* L. COBIAN, J. SHEA, J. SINNOTT, and R. GANGULY. Univ. of South Florida, James A. Haley Veterans' Hosp., and Tampa Gen. Hosp., Tampa, Fla.
- L25.** Improvement in Health Care Provider Response to the Risk of Exposure to Blood and Body Fluids. (143) J. BROESTLER, J. PIPER,\* M. MATSUMOTO, and D. TUTTLE. David Grant U.S. Air Force Med. Ctr., Travis Air Force Base, Calif.
- Col. of Med., Houston, Tex.; and Nat. Naval Med. Ctr., Bethesda, Md.**
- C98.** Evaluation of the Vitek Enteric Pathogen (EPS) Screen Card for Detecting *Salmonella*, *Shigella*, and *Yersinia* spp. (149) C. A. IMPERATRICE\* and I. NACHAMKIN. Univ. of Pennsylvania Med. Ctr., Philadelphia.
- C99.** Modified Mallory's Phosphotungstic Acid-Hematoxylin Permanent Stain Used for Parasitologic Examination of Stool. (151) C. S. PETERS,\* L. HERNANDEZ, J. MONTGOMERY, F. DORIGAN, and F. E. KOCKA. Cook County Hosp., Chicago, Ill.
- C100.** Comparison of Pooled Formalin-Preserved Fecal Specimens versus Three Individual Samples for Detection of Intestinal Parasites. (153) W. ALDEEN,\* J. WHISENANT, K. CARROLL, D. HALE, and J. MATSEN. ARUP Lab. and Univ. of Utah Med. Ctr., Salt Lake City.
- C101.** Incidence of Intestinal Parasitic Infections and Clinical Significance of *Blastocystis hominis* in Humans in Kuwait. (155) P. R. HIRA\* and F. AL-ALI. Microbiol. Dept., Faculty of Med., Kuwait Univ., and Lab. Dept., Farwaniya Hosp., Kuwait.
- C102.** Isolation Rate of *C. concisus* in Children with and without Enteritis. (157) S. LAUWERS,\* Y. VANDENPLAS, J. BREYNAERT, R. VAN ETTERIJCK, and D. PIERARD. Academic Hosp., Free Univ. Brussels, Brussels, Belgium.
- C103.** Two New Phenotypic Tests Useful for Differentiation of *Campylobacter* Species. (159) A. P. BURNENS\* and J. NICOLET. Univ. of Berne, Berne, Switzerland.
- C104.** Common Heat-Stable and Heat-Labile Serotypes among *Campylobacter* Strains from Sporadic Cases in the United States. (161) C. M. PATTON,\* M. A. NICHOLSON, S. OSTROFF, and A. A. RIES. CDC, Atlanta, Ga.
- C105.** Outbreak of *Campylobacter upsaliensis* in Four Day Care Centers in Brussels. (163) H. GOOSSENS,\* P. HANICQ, S. NJUFOM, L. VLAES, C. VAN DEN BORRE, J.-P. BUTZLER, and W. BLOMME. WHO Collaborating Ctr. for Enteric Campylobacter, St. Pieters Univ. Hosp. and Med. Lab., St. Agatha Berchem, Brussels, Belgium.
- C106.** Preliminary Evaluation of a Microtiter Assay for Detection of *Cryptosporidium* Antigen in Stool. (165) Z. XIA, S. SONNAD,\* S. TURNER, and M. MARASIGAN. Stanford Univ., Stanford, Calif., and Alexon, Inc., Mountain View, Calif.
- C107.** *Cryptosporidium* Fecal Antigen Detection by Reverse Passive Hemagglutination. (167) M. FARRINGTON,\* S. WINTERS, C. WALKER, D. RUBENSTEIN, and R. MILLER. Addenbrooke's Hosp., Cambridge, U.K., and Middlesex Hosp., London, U.K.
- C108.** New Cost-Effective Combination Stain for the Identification of Intestinal Protozoa, Including *Cryptosporidium parvum*. (169) J. C. PALMER\* and D. E. LOW. MDS Lab., Etobicoke, Ontario, Canada.
- C109.** Evaluation of a New Monoclonal Antibody Combination Reagent for the Direct Fluorescent Detection of *Giardia* Cysts and *Cryptosporidium* Oocysts in Human Fecal Specimens. (171) L. S. GARCIA,\* A. C. SHUM, and D. A. BRUCKNER. UCLA Med. Ctr., Los Angeles, Calif.
- C110.** Rapid Detection of *Escherichia coli* O157:H7 by Immunofluorescent Staining of Stool Specimens. (173) C. H. PARK\* and D. L. HIXON. Fairfax Hosp., Falls Church, Va.
- C111.** Production of Enterohemolysin by Verotoxin-Producing *Escherichia coli*. (175) D. PIERARD,\* P. POHL, S. LAUWERS, D. STEVENS, and A. NAESSENS. Academic Hosp., Free Univ. Brussels, and Nat. Inst. for Vet. Res., Brussels, Belgium.
- C112.** Evaluation of a Modified Lysine Iron Agar for Detection of *Salmonellae* in Laboratory Animal Feces. (177) M. FLA-

### Session 110 (C). GASTROINTESTINAL PATHOGENS

- C96.** Prospective Identification of Infectious Etiologies of Acute Diarrhea and Dehydration in the Upper Midwest. (145) M. J. JAQUA-STEWART, J. T'CHOTA-LEE,\* G. A. NEIDICH, P. FROST-STOTZ, and K. A. JAQUA. VA Med. Ctr. and Univ. of South Dakota Sch. of Med., Sioux Falls.
- C97.** Diarrhea among United States Marines Returning from Operation Desert Storm. (147) R. L. HABERBERGER, JR.,\* P. ECHEVERRIA, C. L. HARDING, E. CROSS, K. Y. GREEN, A. Z. KAPIKIAN, X. JIANG, M. K. ESTES, J. D. MALONE, S. PAPARELLO, and K. C. HYAMS. Naval Med. Res. Inst., Bethesda, Md.; Armed Forces Res. Inst. of Med. Sci., Bangkok, Thailand; NIH, Bethesda, Md.; Baylor

- VIANI,\* R. CANOTAL, and M. LUGER. California State Dept. of Health Services, Berkeley.
- C113.** Fluorescent Detection of *Salmonella* by Using a Sandwich DNA Hybridization Assay in Microwell Plates. (179) R. J. CANO,\* C. D. GARCIA, J. CASADESUS, and J. C. PALOMARES. Biol. Sci. Dept., California Polytechnic State Univ., San Luis Obispo, and Dept. of Genetics and Microbiol., Univ. of Seville, Seville, Spain.
- C114.** Detection of *Salmonella* Antigen in Sera of Mice Infected with *Salmonella typhimurium*. (181) G. M. JAMES,\* R. D. ROLFE, T. BUTLER, and D. J. HENTGES. Texas Tech Univ. Health Sci. Ctr., Lubbock.
- C115.** Comparison of Methods for Detection of *Salmonella* in Stool Specimens. (183) C. MOHLA\* and J. M. CAMPOS. Children's Nat. Med. Ctr., Washington, D.C.
- C116.** Epidemic Cholera in Colombia: Role of the National Reference Laboratory. I. Laboratory Network. (185) C. I. VARGAS,\* M. ESCALANTE, N. MUNOZ, and E. CASTANEDA. Inst. Nacional de Salud, Bogotá, Colombia.
- C117.** Epidemic Cholera in Colombia: Role of the National Reference Laboratory. II. Research Approaches. (187) E. CASTANEDA,\* M. ESCALANTE, and C. I. VARGAS. Inst. Nacional de Salud, Bogotá, Colombia.
- C118.** Development of a Fast, Simple, and Sensitive Immunoassay To Detect *Vibrio cholerae* O1 from Clinical Samples Using SMART Kit. (189) J. A. K. HASAN,\* L. LOOMIS, A. HUQ, D. BERNSTEIN, M. L. TAMPLIN, R. J. SIEBELING, and R. R. COLWELL. Univ. of Maryland, College Park; New Horizons Diagnostics Corp., Columbia, Md.; Univ. of Florida, Gainesville; and Louisiana State Univ., Baton Rouge.
- C119.** Isolation and Identification of *Vibrio cholerae* O1 Biotypic TOR in the Epidemic of Cholera in Cartagena, Colombia. (191) S. MATTAR,\* S. MENESES, R. HERNANDEZ, J. M. GUARDO, and K. MENDOZA. Postgraduate of Med. Microbiol., Univ. of Cartagena, Cartagena, Colombia.
- C120.** Cholera in Arequipa, Peru (South America): Review of the Epidemics Registered from February through November 1991 (193) F. DELGADO-DIAZ\* and W. MEDINA-RUEDA. Gen. Hosp. Arequipa, Social Security Hosp., and San Agustín Univ., Arequipa, Peru.
- C121.** Specific and Rapid Urease Activity Determination Utilizing an Ammonia Ion Selective Electrode on Partially Purified *Helicobacter pylori* Extracted Urease. (195) P. LIU,\* A. BELENKY, L. CIOTA, J. BOND-GREEN, J. PEACOCK, and F. ZAMANIYAN. EPI, Stony Brook Univ., Stony Brook, N.Y.
- Session 111 (B). IRON: TRANSFERRIN AND HEMOGLOBIN BINDING, SIDEROPHORES, AND OUTER MEMBRANE PROTEINS**
- B104.** Comparative Analysis of Primate Transferrin Binding by Pathogenic Bacteria. (197) S. D. GRAY-OWEN\* and A. B. SCHRYVERS. Univ. of Calgary, Calgary, Alberta, Canada.
- B105.** Expression of the Transferrin Receptor in *Haemophilus influenzae* Is Repressed by Hemin and Not by Elemental Iron. (199) D. J. MORTON\* and T. L. STULL. Med. Col. of Pennsylvania, Philadelphia.
- B106.** Distribution and Heterogeneity of the Transferrin-Binding Proteins in *Actinobacillus pleuropneumoniae*. (201) G.-F. GERLACH,\* S. KLASCHINSKY, C. ANDERSON, A. A. POTTER, and P. J. WILLSON. Vet. Infectious Disease Organization, Univ. of Saskatchewan, Saskatoon, Saskatchewan, Canada.
- B107.** Characterization of Staphylococcal Transferrin-Binding Proteins. (203) B. MODUN\* and P. WILLIAMS. Dept. of Pharmaceutical Sci., Nottingham Univ., Nottingham, U.K.
- B108.** Characterization of the Transferrin-Binding Proteins from *Bordetella* spp. (205) F. D. MENOZZI,\* C. GANTIEZ, B. SAMYN, and J. V. BEEUMEN. Inst. Pasteur, Lille, France, and Rijksuniversiteit, Gent, Belgium.
- B109.** Cloning and Characterization of the Ferric Enterobactin Receptor Gene of *Pseudomonas aeruginosa*. (207) C. R. DEAN\* and K. POOLE. Queen's Univ., Kingston, Ontario, Canada.
- B110.** Cloning, Expression, and Nucleotide Sequence Determination of the Gene Encoding the Ferripyoverdine Receptor of *Pseudomonas aeruginosa*. (209) K. POOLE, D. E. HEINRICH,\* and S. NESHAT. Queen's Univ., Kingston, Ontario, Canada.
- B111.** The Pyocin Sa Receptor of *Pseudomonas aeruginosa* Is Associated with Ferri-Pyoverdine Uptake. (211) P. H. HIRST, K. GENSBERG, K. HUGHES, and A. W. SMITH.\* Aston Univ., Birmingham, U.K.
- B112.** A *Tn5 lac* Insertion Which Impairs Siderophore Production by *Bordetella bronchiseptica*. (213) L. AGIATO\* and D. W. DYER. SUNY at Buffalo, Buffalo, N.Y.
- B113.** Activity and Specificity of a Mouse Monoclonal Antibody to Ferric Aerobactin. (215) D. LE ROY,\* D. EXPERT, S. PECQUET, C. BOHUON, and A. ANDREMONT. Inst. Gustave-Roussy, Villejuif, France; Inst. Nat. Agronomique, Paris, France; and Faculté de Pharmacie, Chatenay-Malabry, France.
- B114.** Incidence of Aerobactin in Blood Isolates of *Klebsiella pneumoniae* ( $n = 241$ ) and *Escherichia coli* ( $n = 125$ ). (217) V. VERNET,\* C. MADOLET, R. JAUSSAUD, O. BAJOLET, E. LE MAGREX, C. CHIPPAUX, and A. PHILIPPON. Univ. of Med., Reims, France, and Saint-Louis Hosp., Paris, France.
- B115.** Functional Characterization of the AngR Protein. (219) M. E. TOLMASKY,\* L. A. ACTIS, and J. H. CROSA. Oregon Health Sci. Univ., Portland.
- B116.** Use of the *Vibrio cholerae fur* Gene as a Probe To Detect Homologous DNA in Other Pathogenic Bacteria and To Map the *fur* Gene of *Vibrio vulnificus*. (221) C. M. LITWIN\* and S. B. CALDERWOOD. Massachusetts Gen. Hosp., Boston.
- B117.** Fur-Regulated Expression of Surface Proteins in *Yersinia*. (223) T. M. STAGGS,\* M. L. PENDRAK, and R. D. PERRY. Univ. of Kentucky Med. Ctr., Lexington.
- B118.** Cloning of Inorganic Iron and Hemin Utilization Systems from *Yersinia pestis*. (225) R. D. PERRY. Univ. of Kentucky Med. Ctr., Lexington.
- B119.** Membrane Protein Expression by *Actinobacillus actinomycetemcomitans* in Response to Iron Availability. (227) J. L. WINSTON,\* C.-K. CHEN, and M. E. NEIDERS. SUNY at Buffalo, Buffalo, N.Y.
- B120.** Identification and Characterization of a 50-kDa Iron-Binding Protein from the Outer Membrane of *Pseudomonas aeruginosa*. (229) K. POOLE,\* C. MCNALLY, and S. NESHAT. Queen's Univ., Kingston, Ontario, Canada.
- B121.** Detection of a Bacterial Receptor for Human Hemoglobin. (231) M. E. HICKMAN,\* D. J. MORTON, J. WOOLLEN, and T. L. STULL. Med. Col. of Pennsylvania, Philadelphia.
- B122.** Comparison of Siderophore- and Desferrioxamine-Mediated Iron Acquisition in *Yersinia enterocolitica*. (233) C. E. CHAMBERS\* and P. A. SOKOL. Univ. of Calgary, Calgary, Alberta, Canada.
- B123.** Enterobactin Biosynthesis and Transport Genes of *Salmonella typhimurium* and *Salmonella austin*. (235) I. LOPEZ-GONI,\* M. TUMMURU, X. HONG, K. JOHANSEN, and M. MCINTOSH. Univ. of Missouri, Columbia.

- B124.** Cloning of an Iron-Regulated Protein of *Corynebacterium diphtheriae*. (237) Y. ZHU\* and S. TAI. Arizona State Univ., Tempe.
- B125.** Protocatechuic Acid Production by *Bacillus anthracis* in Low-Iron Conditions. (239) T. M. KOEHLER,\* R. PASHA, and K. P. WILLIAMS. Univ. of Texas Med. Sch. and Baylor Col. of Med., Houston.
- B126.** Utilization of Hemin as an Iron Source by *Vibrio cholerae*. (241) D. P. HENDERSON\* and S. M. PAYNE. Univ. of Texas, Austin.
- B127.** Effect of Hemopexin on the Growth of *Bacteroides fragilis*. (243) E. R. ROCHA,\* A. SMITH, and J. H. BROCK. Dept. of Immunology, Western Infirmary, Glasgow, U.K., and Sch. of Basic Life Sci., Univ. of Missouri, Kansas City.
- B128.** 2,3-Dihydroxybenzoate-Promoted Iron Uptake in *Brucella abortus*. (245) I. LOPEZ-GONI\* and J. B. NEILANDS. Univ. of California, Berkeley.
- B129.** Isolation of *Bordetella bronchiseptica* Mutants Deficient in Siderophore Production. (247) S. K. ARMSTRONG\* and M. O. CLEMENTS. East Carolina Univ. Sch. of Med., Greenville, N.C.

### Session 112 (B). EXOTOXINS

- B130.** Shiga Toxin-Associated Hemolytic Uremic Syndrome: Combined Cytotoxic Effects of Lipopolysaccharide and Shiga Toxin on Human Vascular Endothelial Cells In Vitro. (249) C. LOUISE\* and T. OBRIG. Univ. of Rochester, Rochester, N.Y.
- B131.** The Tetrasaccharide *N*-Trifluoroacetyl Globo-*N*-Tetraose Is a Water-Soluble Analog of the Shiga-Like Toxin I Receptor. (251) M. SALEH\* and J. GARIEPY. Dept. of Med. Biophysics, Univ. of Toronto, Toronto, Ontario, Canada.
- B132.** Specific Functional Incorporation of Shiga and Shiga-Like Toxin Receptor Glycolipids into Cell Membranes. (253) M. JACEWICZ\* and G. T. KEUSCH. New England Med. Ctr., Boston, Mass.
- B133.** Pathogenesis of Shiga-Like Toxin Type II-Related Toxins in an Orally Infected Murine Model. (255) S. W. LINDGREN,\* J. E. SAMUEL, C. K. SCHMITT, and A. D. O'BRIEN. Uniformed Services Univ. of the Health Sci., Bethesda, Md.
- B134.** Purification and Quantitation of Shiga-Like Toxin II Variants. (257) D. ACHESON,\* M. JACEWICZ, A. KANE, A. DONOHUE-ROLFE, and G. KEUSCH. New England Med. Ctr., Boston, Mass.
- B135.** Comparison of the Relative Pathogenicity of Shiga-Like Toxins Type I and Type II in Mice. (259) V. L. TESH,\* V. M. GORDON, J. A. BURRIS, and A. D. O'BRIEN. Uniformed Services Univ. and Section of Comparative Pathology, NIH, Bethesda, Md.
- B136.** Cloning of Genes from *Vibrio hollisae* Associated with Chinese Hamster Ovary Cell Elongation. (261) M. D. MILIOTIS,\* M. H. KOTHARY, C. M. KONDRATICK, and E. F. CLAVERIE. Div. of Microbiol., FDA, Washington, D.C.
- B137.** Partial Purification of a Toxin from *Yersinia enterocolitica* That Causes the Elongation of Chinese Hamster Ovary Cells. (263) V. SATHYAMOORTHY,\* J. T. STANFIELD, and B. A. MCCARDELL. Div. of Microbiol., FDA, Washington, D.C.
- B138.** Purification and Characterization of a Vacuolating Toxin from *Helicobacter pylori*. (265) T. L. COVER\* and M. J. BLASER. Vanderbilt Univ. and Dept. of Veterans Affairs Med. Ctr., Nashville, Tenn.
- B139.** RTX-Related Cytolysins of *Actinobacillus equuli* and *Actinobacillus lignieresii*. (267) L. L. BURROWS\* and R. Y.

C. LO. Dept. of Microbiol., University of Guelph, Guelph, Ontario, Canada.

- B140.** Prevalence of Cytotoxin Production among *Haemophilus ducreyi* Strains. (269) M. PURVEN,\* E. FALSEN, and T. LAGERGARD. Dept. of Med. Microbiol. and Immunology, Univ. of Göteborg, Göteborg, Sweden.
- B141.** Neutralizing Antibodies to *Haemophilus ducreyi* Cytotoxin. (271) T. LAGERGARD,\* M. PURVEN, and L. NILSSON. Göteborg Univ., Göteborg, Sweden.
- B142.** Conformational Changes Associated with Bovine Serum Albumin Enhancement of *Pasteurella haemolytica* Leukotoxin Activity. (273) K. D. CLINKENBEARD\* and B. J. WAURZYNIAK. Dept. of Vet. Pathology, Oklahoma State Univ., Stillwater.
- B143.** Mutants of *Pasteurella haemolytica* That Do Not Produce Leukotoxin. (275) M. CHIDAMBARAM,\* B. SHARMA, and G. M. WEINSTOCK. Univ. of Texas Med. Sch., Houston.
- B144.** Morphometric Quantitation of Osteoclasts in the Nasal Conchae of Gnotobiotic Pigs Given Purified *Pasteurella multocida* Protein Toxin. (277) M. R. ACKERMANN,\* D. A. ADAMS, L. GERKEN, R. B. RIMLER, and J. R. THURSTON. Nat. Animal Disease Ctr., Agricultural Res. Service, USDA, and Col. of Vet. Med., Iowa State Univ., Ames.
- B145.** Binding of Colloidal Gold-Labeled *Pasteurella multocida* Dermonecrotic Toxin to Two Cell Lines. (279) R. K. PETTIT\* and M. R. ACKERMAN. USDA, Agricultural Res. Service, Nat. Animal Disease Ctr., Ames, Iowa.
- B146.** Recognition of Unique Epitopes of Staphylococcal Toxic Shock Syndrome Toxin-1 by Polyclonal and Monoclonal Antibodies. (281) W. W. S. KUM,\* K. B. LAUPLAND, and A. W. CHOW. Univ. of British Columbia and Vancouver Gen. Hosp., Vancouver, British Columbia, Canada.
- B147.** Glycerol Monolaurate Inhibits the Production of Toxic Shock Syndrome Toxin-1 and Alpha Hemolysin at the Level of Transcription. (283) S. J. PROJAN,\* S. BROWN-SKROBOT, P. M. SCHLIEVERT, S. L. MOGHAZEHE, and R. P. NOVICK. Publ. Health Res. Inst., New York, N.Y.; Personal Products Corp., Miltown, N.J.; and Univ. of Minnesota Med. Sch., Minneapolis.
- B148.** Effect of Glycerol Monolaurate on Multiplication of Gram-Positive and Gram-Negative Bacteria and Production of Toxic Shock Syndrome Toxin-1 by *Staphylococcus aureus*. (285) J. PARSONNET\* and P. A. MODERN. Dartmouth Med. Sch., Hanover, N.H.
- B149.** Molecular Population Genetic Analysis of the Pyrogenic Exotoxin Serotype C Gene in Natural Populations of *Streptococcus pyogenes*. (287) V. KAPUR,\* K. JELSON, R. K. SELANDER, and J. M. MUSSER. Baylor Col. of Med., Houston, Tex., and Pennsylvania State Univ., University Park.
- B150.** Purification, Partial Characterization, and Genomic Cloning of a 25-kDa Exotoxin from *Staphylococcus aureus* D4508. (289) K. REN\* and J. B. ZABRISKIE. Rockefeller Univ., New York, N.Y.
- B151.** Activation of the Hemolytic Lethal ( $\alpha$ ) Toxin of *Clostridium septicum* Occurs via Proteolytic Cleavage. (291) J. BALLARD\* and R. K. TWETEN. Dept. of Microbiol. and Immunology, Univ. of Oklahoma Health Sci. Ctr., Oklahoma City.
- B152.** Site-Directed Mutagenesis of the Toxin B Gene from *Clostridium difficile*. (293) L. A. BARROSO,\* C. J. PHELPS, and T. D. WILKINS. Dept. of Anaerobic Microbiol., Virginia Polytechnic Inst. and State Univ., Blacksburg.
- B153.** Characterization of Toxin B from a Toxin A-/Toxin B- Strain of *Clostridium difficile*. (295) L. A. BARROSO, D. M. LYERLY,\* and T. D. WILKINS. Dept. of Anaerobic Microbiol., Virginia Polytechnic Inst. and State Univ., Blacksburg.
- B154.** Localization of the Insect Specificity Domain of the *Bacillus thuringiensis* subsp. *israelensis* Endotoxin. (297) M.

THURSDAY



ROBINSON, G. SCHMEISSER,\* J. A. MEUNIER, and C. VANN. Ball State Univ., Muncie, Ind.

- B155.** Alteration of Pig Edema Disease Toxin Tissue Targets in Swine by Mutagenesis of the Toxin. (299) B. BOYD, G. TYRRELL,\* C. GYLES, J. BRUNTON, and C. LINGWOOD. Samuel Lunenfeld Res. Inst., Mount Sinai Hosp., and Hosp. for Sick Children Res. Inst., Univ. of Toronto, Toronto, Ontario, Canada.
- B156.** Influence of Redox Potential on Growth and Leukotoxicity of *Fusobacterium necrophorum*. (301) Z. TAN,\* T. NAGARAJA, and M. CHENGAPPA. Kansas State Univ., Manhattan.
- B157.** Minimum Sequence of the Shiga Toxin A Subunit Required for Enzymatic Activity and Holotoxin Assembly. (303) J. E. HADDAD\* and M. P. JACKSON. Wayne State Univ. Sch. of Med., Detroit, Mich.

### Session 113 (B). VIRULENCE AND INVASION OF *SALMONELLA* AND *ESCHERICHIA COLI*

- B158.** A *Salmonella* Virulence Locus That Is Homologous to a Family of Transporters. (305) C. PARRA,\* M. BAER, and E. A. GROISMAN. Washington Univ. Sch. of Med., St. Louis, Mo.
- B159.** Characterization of *Salmonella typhimurium* Plasmids Mutated in the *rsk* Locus. (307) H. Y. NIU,\* R. L. WARREN, T. COOK, and D. J. KOPECKO. Univ. of Maryland, College Park, and Walter Reed Army Inst. of Res., Washington, D.C.
- B160.** Isolation of a Temperature-Regulated *TnphoA* Insertional Mutant of *Salmonella typhimurium* That Exhibits Increased Serum Susceptibility. (309) L. ZHANG,\* S.-J. TSAI, E. MUSSIN, M. LIU, and J. L. VANDENBOSCH. Eastern Michigan Univ., Ypsilanti.
- B161.** *katF* Influences the Expression of a *Salmonella* Plasmid-Encoded Virulence Gene. (311) F. FANG,\* S. LIBBY, N. BUCHMEIER, and D. GUINEY. Univ. of California, San Diego.
- B162.** pH-Dependent *Salmonella* Gene Transcription within Phagosomes Inhibits Lysosomal Fusion. (313) C. ALPUCHE-ARANDA,\* J. SWANSON, W. LOOMIS, and S. MILLER. Massachusetts Gen. Hosp. and Harvard Med. Sch., Boston.
- B163.** The *Salmonella typhimurium* Virulence Plasmid Affects the Growth Rate of *Salmonellae* in Mice, Probably within Infected Host Cells. (315) P. A. GULIG\* and T. J. DOYLE. Univ. of Florida Col. of Med., Gainesville.
- B164.** Identification and Molecular Characterization of a *Salmonella typhimurium* Gene Involved in Triggering the Internalization of *Salmonellae* into Cultured Epithelial Cells. (317) C. GINOCCHIO,\* J. PACE, and J. GALAN. Dept. of Microbiol., SUNY Stony Brook, Stony Brook, N.Y.
- B165.** Osmoregulation of *Salmonella typhi* Invasion of Henle 407 Intestinal Epithelial Cells. (319) C. TARTERA\* and E. S. METCALF. Uniformed Services Univ. of the Health Sci., Bethesda, Md.
- B166.** Interaction of *Salmonella typhimurium* with Cultured Epithelial Cells Is Accompanied by a Rise in Free Intracellular Calcium Levels. (321) J. PACE\* and J. GALAN. Dept. of Microbiol., SUNY Stony Brook, Stony Brook, N.Y.
- B167.** Properties of the Invasion Defective  $\mu$  d/*lac* Insertion Mutant of *Salmonella typhimurium*. (323) R. K. ERNST,\* Y. QIU, W. K. LEE, and J. M. MERRICK. SUNY at Buffalo, Buffalo, N.Y.
- B168.** Negative Regulation of *Salmonella typhimurium* Epithelial Cell Invasion by the PhoP/PhoQ Virulence Regulatory System. (325) I. BEHLAU\* and S. I. MILLER. Massachusetts Gen. Hosp., Boston.
- B169.** Model for Measuring the Induction of Tumor Necrosis Factor Secretion by U937 Macrophagelike Cells after Infection with *Salmonella typhi*. (327) A. M. HARRIS,\* J. HASDAY, and D. M. HONE. Dept. of Med., Univ. of Maryland Sch. of Med., Baltimore.
- B170.** A "Safe Site" for *Salmonella typhimurium* Is within Splenic Polymorphonuclear Cells. (329) N. DUNLAP,\* W. BENJAMIN, JR., A. BERRY, and J. ELDRIDGE. Univ. of Alabama and VA Med. Ctr., Birmingham.
- B171.** Importance of Respiratory Colonization following Infection with *Salmonella typhimurium* in Swine. (331) P. J. FEDORKA-CRAY,\* S. KELLY, and J. T. MEEHAN. Nat. Animal Disease Ctr., USDA, Agricultural Res. Service, Ames, Iowa, and Washington Univ., St. Louis, Mo.
- B172.** Functional Homologs of *Salmonella typhimurium* Mouse Virulence Gene *mviS* and Flagellar Genes *flgA*, *flgB*, *flgC*, *flgD*, and *flgE* in *Salmonella gallinarum*. (333) M. CARSIO-TIS\* and B. A. D. STOCKER. Univ. of Cincinnati, Cincinnati, Ohio, and Stanford Univ. Sch. of Med., Stanford, Calif.
- B173.** Identification of Chromosomal Sequences Encoding Putative Virulence Genes in *Salmonella choleraesuis* by Subtractive Hybridization. (333) G. G. MAHAIRAS\* and R. CURTISS III. Washington Univ., St. Louis, Mo.
- B174.** Molecular Analysis of the *Salmonella typhimurium* Virulence Gene *mviS*. (337) C. K. SCHMITT,\* V. L. TESH, M. CARSIO-TIS, and A. D. O'BRIEN. Uniformed Services Univ. of the Health Sci., Bethesda, Md., and Univ. of Cincinnati Col. of Med., Cincinnati, Ohio.
- B175.** Effect of *inv* Mutations on *Salmonella enteritidis* Virulence and Colonization in White Leghorn Chickens. (339) S. B. PORTER. Washington Univ., St. Louis, Mo.
- B176.** Growth Characteristics of *Salmonella enteritidis* in Chicks of Susceptible and Resistant Lines. (341) W. H. BENJAMIN, JR.,\* P. D. HALL, and R. L. TAYLOR, JR. Univ. of Alabama, Birmingham, and Univ. of New Hampshire, Durham.
- B177.** Identification of Variable Lipopolysaccharide Forms and Replication Rates in *Salmonella enteritidis* Avirulent and Virulent Field Isolates. (343) J. G. PETTER. USDA, Agricultural Res. Service, Southeast Poultry Res. Lab., Athens, Ga.
- B178.** Antibodies to Outer Membrane Protein A (OmpA) Block Bactericidal Killing of *Escherichia coli*. (345) J. N. WEISER,\* M. S. BLAKE, and E. C. GOTSCHLICH. Rockefeller Univ., New York, N.Y.
- B179.** Plasmid-Encoded Factors Regulate the Expression of *eae* Gene of Enteropathogenic *Escherichia coli*. (347) O. GOMEZ\* and J. KAPER. Univ. of Maryland, Baltimore.
- B180.** Phosphorylation of Cytoskeletal Proteins by Enteropathogenic *Escherichia coli*. (349) L. RILEY,\* B. RUSSELL, S. AGARWAL, S. ARRUDA, and J. HO. Cornell Univ. Med. Col., New York, N.Y.
- B181.** Epithelial Cell Invasion by the Enterotoxigenic *Escherichia coli* *tib* Locus Is Associated with a 118-kDa Outer Membrane Protein. (351) E. A. ELSINGHORST. Walter Reed Army Inst. of Res., Washington, D.C.
- B182.** Necrotizing *Escherichia coli* CNF1' from Bacteremia and Urinary Tract Infections. (353) C. G. CLAY,\* A. S. GREEFF, H. H. CREWE-BROWN, B. DE VILLIERS, M. BLANCO, E. A. GONZALEZ, and J. BLANCO. Medunsa, South Africa, and F. Vet., Univ. de Santiago de Compostela, Lugo, Spain.
- B183.** Detection and Analysis of the Gene from *Escherichia coli* Encoding Cytotoxic Necrotizing Factor Type 2. (355) E. OSWALD,\* P. POHL, E. JACQMAIN, P. LINTERMANS, K. VAN MUYLEM, and J. MAINIL. Uniformed Services Univ. of the Health Sci., Bethesda, Md.; Inst. Nat. de la

Recherche Agronomique, Paris, France; Inst. Nat. de Recherches Vet., Brussels, Belgium; and Faculté de Med. Vet., Liège, Belgium.

### Session 114 (D). *PSEUDOMONAS* VIRULENCE FACTORS AND PHYSIOLOGY

- D44.** Cloning of a Gene Structurally and Functionally Similar to the *Escherichia coli* *fur* Gene from *Pseudomonas aeruginosa* PA103. (357) R. W. PRINCE\* and M. L. VASIL. Univ. of Colorado Health Sci. Ctr., Denver.
- D45.** Sequence Analysis of *Pseudomonas aeruginosa* DNA Containing the Alginate Gene *algT* Reveals the Adjacent Gene *nadB* Encoding Aspartate Oxidase. (359) W. A. WOODRUFF,\* D. J. HASSETT, and D. E. OHMAN. Univ. of Tennessee and VA Med. Ctr., Memphis, and Univ. of North Carolina, Chapel Hill.
- D46.** Transcriptional Activation of *lasR*. (361) A. M. ALBUS\* and B. H. IGLEWSKI. Univ. of Rochester, Rochester, N.Y.
- D47.** Identification, Cloning, and Sequencing of a *luxI* Homolog (*lasI*) from *Pseudomonas aeruginosa*. (363) J. M. COOK\* and B. H. IGLEWSKI. Univ. of Rochester, Rochester, N.Y.
- D48.** Analysis of the *Pseudomonas aeruginosa* Elastase (*lasB*) Regulatory Region. (365) L. RUST\* and B. H. IGLEWSKI. Univ. of Rochester Sch. of Med. and Dent., Rochester, N.Y.
- D49.** *Pseudomonas aeruginosa lasM* Encodes a Regulator of *lasB* Transcription, Exoproduct Synthesis, and Growth Phase Transition. (367) J. M. BRINT. Univ. of Tennessee and VA Med. Ctr., Memphis.
- D50.** Expression of Elastase in *Pseudomonas aeruginosa* by Chromosomal *lasB* and Mutant Alleles Requires the Downstream Gene *lasC*. (369) K. S. MCIVER\* and D. E. OHMAN. Univ. of Tennessee and VA Med. Ctr., Memphis.
- D51.** *Pseudomonas aeruginosa* Protease IV: Cloning of a Caseinase Which Is Not Transcriptionally Activated by *lasR*. (371) D. S. TODER\* and M. J. GAMBELLO. Univ. of Rochester, Rochester, N.Y.
- D52.** The Propeptide of *Pseudomonas aeruginosa* Elastase Acts as an Elastase Inhibitor. (373) E. KESSLER\* and M. SAFRIN. Goldschleger Eye Inst., Tel Aviv Univ., Sheba Med. Ctr., Tel Hashomer, Israel.
- D53.** Cloning of a Protease Gene from *Pseudomonas cepacia*. (375) A. D. COX\* and P. A. SOKOL. Univ. of Calgary, Calgary, Alberta, Canada.
- D54.** Cloning and Characterization of Genes Encoding the Iron and Manganese Superoxide Dismutases in *Pseudomonas aeruginosa*. (377) D. J. HASSETT,\* W. A. WOODRUFF, and D. J. WOZNIAK. Univ. of North Carolina, Chapel Hill, and Univ. of Tennessee, Memphis.
- D55.** Factors Regulating the Expression of the *Pseudomonas aeruginosa* Flagellin Gene. (379) M. STARNBACH\* and S. LORY. Stanford Univ., Stanford, Calif., and Univ. of Washington, Seattle.
- D56.** Evidence of Free Phosphotyrosine in the Flagella of *Pseudomonas aeruginosa*. (381) S. L. SOUTH,\* K. KELLY-WINTENBERG, W. B. SLOAT, and T. C. MONTIE. Univ. of Tennessee, Knoxville.
- D57.** Chemotaxis to Oligopeptides by *Pseudomonas aeruginosa*. (383) K. KELLY-WINTENBERG\* and T. C. MONTIE. Univ. of Tennessee, Knoxville.
- D58.** Structure and Function of OprF, a Major Outer Membrane Protein of *Pseudomonas aeruginosa*. (385) R. WONG,\* E. RAWLING, and R. E. W. HANCOCK. Univ. of British Columbia, Vancouver, British Columbia, Canada.
- D59.** Characterization of Bacterial Ligands Involved in the Nonopsonic Phagocytosis of *Pseudomonas aeruginosa*. (387) E. MAHENTHIRALINGAM\* and D. P. SPEERT. Univ. of British Columbia, Vancouver, British Columbia, Canada.

- D60.** A 50-kDa Nonpilus Adhesin of *Pseudomonas aeruginosa* Is Temperature and Nutrient Regulated. (389) R. RAMPHAL,\* S. CODADA, and L. CHENG. Univ. of Florida, Gainesville.
- D61.** Characterization of a *Pseudomonas aeruginosa* Nonpilus Adhesin Involved in Mucin Recognition. (391) C. CARNOY,\* R. RAMPHAL, A. SCHARFMAN, Y. COURTIES, G. LAMBLIN, and P. ROUSSEL. Unite INSERM 16, Lille Cedex, France, and Dept. of Med., Univ. of Florida, Gainesville.
- D62.** Ciprofloxacin Treatment of Nonmucoid *Pseudomonas aeruginosa* in a Chemostat Results in a Resistant Mucoid Population. (393) S. E. PINA,\* J. M. TERRY, and S. J. MATTINGLY. Univ. of Texas Health Sci. Ctr., San Antonio.
- D63.** Identification of Synthetic Peptides Representing Epitopes of Outer Membrane Protein F of *Pseudomonas aeruginosa* Capable of Eliciting Antibodies That React with Whole Cells of *P. aeruginosa*. (395) E. E. HUGHES,\* L. B. GILLEFLAND, and H. E. GILLEFLAND, JR. Louisiana State Univ. Med. Ctr., Shreveport.
- D64.** Effects of Prednisolone Treatment on Bacterial Clearance and Corneal Response in a Murine *Pseudomonas aeruginosa* Induced Keratitis Model. (397) K. A. KERNACKI,\* M. J. PRESTON, and R. S. BERK. Dept. of Immunology/Microbiol., Wayne State Univ., Detroit, Mich.

### POSTER SESSIONS

Thursday, 10:30–Noon, Exhibit Hall C

(Board numbers in parentheses)

### Session 115 (P). CHARACTERIZATION AND DETECTION OF GRAM-NEGATIVE BACTERIA IN FOODS

- P1.** Establishment of Critical Control Points in West Coast Oyster Processing Plants. (002) C. A. KAYSNER,\* R. F. STOTT, C. ABEYTA, JR., K. G. COLBURN, P. A. TROST, and M. M. WEKELL. FDA, Bothell, Wash.
- P2.** Detection of *Vibrio cholerae* O1 Using the Polymerase Chain Reaction. (004) S. P. KEASLER\* and R. H. HALL. Div. of Microbiol., FDA, Washington, D.C.
- P3.** Detection of *Vibrio cholerae* O1 Toxin Genes in Naturally Contaminated Oysters by Polymerase Chain Reaction. (006) S. R. ZYWNO,\* P. FIELDS, O. OLSVIK, M. L. MOTES, and A. DEPAOLA. FDA, Dauphin Island, Ala., and CDC, Atlanta, Ga.
- P4.** Antibody-Mediated Killing of *Vibrio vulnificus* by Normal Human Serum. (008) J. LIU,\* M. SCOTT, A. PRABHAKARAN, A. BANTA, and R. SIEBELING. Louisiana State Univ., Baton Rouge.
- P5.** Analysis of *Vibrio vulnificus* Capsular Polysaccharide. (010) J. SIMONSON\* and L. SPRING. Louisiana State Univ., Baton Rouge.
- P6.** Survival of *Vibrio cholerae* O1 in Fish during Frozen Storage. (012) E. L. ELLIOT\* and L. B. KOOPMAN. Ctr. for Food Safety and Applied Nutrition, FDA, Washington, D.C.
- P7.** A Fluorogenic Lactose Analog Medium for the Rapid Identification of *Salmonella* spp. (014) C. K. WUN\* and J. R. COHEN. Springfield Col., Springfield, Mass.
- P8.** Unique Thermotolerance of *Salmonella senftenberg* 775W. (016) F. M. KHAMBATY,\* P. D. SINGER, and D. B. SHAH. FDA, Washington, D.C.

THURSDAY

- P9.** Pathogenic Salmonellae That Lack the Large Virulence Plasmid. (018) S. P. KEASLER,\* D. E. HANES, and K. A. LAMPEL. Div. of Microbiol., FDA, Washington, D.C.
- P10.** Detection of *Salmonella* Isolates with All Serotypes by Polymerase Chain Reaction. (020) H. Y. TSEN,\* S. J. WANG, C. K. LIN, and J. W. LIU. Dept. of Food Sci., Nat. Chung Hsing Univ., Taichung, Taiwan, Republic of China.
- P11.** Detection and Characterization of the *eae* Gene of Shiga-Like Toxin-Producing *Escherichia coli* Using Polymerase Chain Reaction. (022) V. P. J. GANNON,\* M. RASHED, R. KING, J.-Y. KIM, and E. J. GOLSTEYN-THOMAS. Animal Diseases Res. Inst., Agriculture Canada, Lethbridge, Alberta, Canada.
- P12.** Cloning of the Leucocin A Gene into *Escherichia coli*. (024) G. ALLISON,\* K. ROY, and M. STILES. Univ. of Alberta, Edmonton, Alberta, Canada.
- P13.** Genetic Analysis of *uidA* Gene Expression in Enterohemorrhagic *Escherichia coli* Serotype O157:H7. (026) P. FENG\* and K. A. LAMPEL. Div. of Microbiol., FDA, Washington, D.C.
- P14.** Effects of Nutritional Conditions on Biofilm Formation by *Escherichia coli* O157:H7. (028) R. DEWANTI\* and A. C. L. WONG. Univ. of Wisconsin, Madison.
- P15.** Elimination of *Escherichia coli* O157:H7 in Meats by Gamma Radiation. (030) D. W. THAYER\* and G. BOYD. Eastern Regional Res. Ctr., USDA, Agricultural Res. Service, Philadelphia, Pa.
- P16.** Purification, Characterization, and Localization of a Unique Outer Membrane Glycoprotein Expressed by Enterohemorrhagic *Escherichia coli* of Serotypes O157:H7 and O26:H11. (032) N. V. PADHYE\* and M. P. DOYLE. Univ. of Wisconsin, Madison, and Univ. of Georgia, Griffin.
- P17.** Behavior of *Escherichia coli* O157:H7 during Cottage Cheese Manufacture. (034) M. AROCHA,\* J. RUPNOW, L. BULLERMAN, M. MCVEY, and S. LODER. Univ. Santa Maria, Caracas, Venezuela, and Univ. of Nebraska, Lincoln.
- P18.** Comparison of Two Enrichment Procedures in the Isolation of *Yersinia enterocolitica* and Related Species from Food. (036) M. LANDGRAF,\* A. TASSINARI, and B. D. G. FRANCO. Univ. São Paulo, São Paulo, SP, Brazil.
- P19.** Acidulant Model for *Aeromonas hydrophila* K144. (038) S. A. PALUMBO\* and A. C. WILLIAMS. Eastern Regional Res. Ctr., USDA, Agricultural Res. Service, Philadelphia, Pa.

### Session 116 (Q). BIODEGRADATION OF PETROLEUM AND ITS COMPONENTS

- Q106.** Enhancement of Polyether Biodegradation in Activated Sludge. (040) L. CHRISTOPHER,\* G. HOLZER, and J. HUBBARD. Georgia Inst. of Technology, Atlanta.
- Q107.** Effects of Nitrogen Additions on Propane and Butane Biodegradation in Sandy Soils. (042) P. L. TOCCALINO\* and D. R. BOONE. Oregon Graduate Inst., Beaverton.
- Q108.** Enhancement of Octadecane Biodegradation by a *Pseudomonas* Rhamnolipid Surfactant. (044) Y. ZHANG and R. M. MILLER.\* Univ. of Arizona, Tucson.
- Q109.** Degradation of Aromatic Hydrocarbons under Anoxic Conditions by *Pseudomonas* sp. Strain W31. (046) M. D. MIKESELL\* and R. H. OLSEN. Univ. of Michigan Med. Sch., Ann Arbor.
- Q110.** Biotransformation of the Benzene, Toluene, Ethylbenzene, and Xylene Family of Environmental Pollutants by *Phanerochaete chrysosporium* Is Associated with Primary Metabolism. (048) J. S. YADAV\* and C. A. REDDY. Michigan State Univ., East Lansing.

- Q111.** Microbial Characterization and Toxicity Assays of a Bioremediation Process Treating Petrochemical Tars. (050) M. M. KOY\* and B. J. HAYES. Radian Corp., Austin, Tex.
- Q112.** Microbial Degradative Activity in Groundwater at a Chemical Waste Disposal Site. (052) H.-M. HWANG\* and R. E. HODSON. Jackson State Univ., Jackson, Miss., and Univ. of Georgia, Athens.
- Q113.** Microbial Scrubbing of Benzene-Toluene-Xylene Solvent Mixtures and Chlorinated Solvents from Air. (054) Y.-S. OH\* and R. BARTHA. Rutgers Univ., New Brunswick, N.J.
- Q114.** Biodegradation of Groundwater Pollutant Mixture by a Soil Mycobacterium. (056) B. L. BURBACK\* and J. J. PERRY. North Carolina State Univ., Raleigh.
- Q115.** Effects of Dissolved Oxygen on Biodegradation of Gasoline Components in Saturated Soil Columns. (058) J. P. SALANITRO,\* H. L. WISNIEWSKI, and I. J. DORTCH. Shell Development Co., Houston, Tex.
- Q116.** Microbial Processing of Volatile Organics. (060) R. D. ROGERS,\* J. H. WOLFRAM, and D. M. HIGDEM. Idaho Nat. Engineering Lab., Idaho Falls, and J. R. Simplot Co., Pocatello, Idaho.
- Q117.** Biodegradation of Crude Petroleum to Methane by Anaerobic Bacterial Consortia. (062) G. HUIE, J. ISBISTER, S. CZARNECKI, and S. BARIK.\* Arctech, Inc., Chantilly, Va.
- Q118.** Biodegradation of Petroleum Hydrocarbons at Three Hazardous Waste Sites. (064) B. J. HAYES\* and K. J. BOMBAUGH. Radian Corp., Austin, Tex.
- Q119.** Changes in Acute Toxicity during On-Site Bioremediation of Soil Contaminated by No. 2 Fuel Oil. (066) J. SHEN\* and R. BARTHA. Rutgers Univ., New Brunswick, N.J.

### Session 117 (K). METABOLISM OF PHENOLICS AND HALOGENATED ORGANICS

- K29.** Purification and Characterization of a *Flavobacterium* Tetrachloro-*p*-Hydroquinone Reductase. (068) I. XUN\* and C. ORSER. Univ. of Idaho, Moscow.
- K30.** Cloning and Analysis of the Genetic Determinant *pcpB* for Pentachlorophenol Hydroxylase from *Flavobacterium* sp. Strain ATCC 39723. (070) C. ORSER,\* J. SCHNEIDER, I. XUN, and C. LANGE. Univ. of Idaho, Moscow.
- K31.** Identification of *aadR*, a Regulatory Gene Required for Anaerobic 4-Hydroxybenzoate Degradation by *Rhodospseudomonas palustris*. (072) M. DISPENZA\* and C. S. HARWOOD. Univ. of Iowa, Iowa City.
- K32.** Isolation of an *s*-Triazine Dechlorination Gene from *Rhodococcus corallinus*. (074) W. SEFFENS\* and W. W. MULBRY. Pesticide Degradation Lab., USDA, Agricultural Res. Service, Beltsville, Md.
- K33.** Genetic Organization and Regulation of the *p*-Cresol Regulon of *Pseudomonas mendocina* KRI. (076) A. WRIGHT\* and R. H. OLSEN. Univ. of Michigan Med. Sch., Ann Arbor.
- K34.** Polynuclear Aromatic Hydrocarbon Metabolism by *Pseudomonas* sp. Strain ANT-1. (078) G. R. JOHNSON\* and R. H. OLSEN. Univ. of Michigan Med. Sch., Ann Arbor.
- K35.** Metabolism of 2,3,5-Trichlorobenzoate by *Pseudomonas aeruginosa* JB2: Evidence for a Novel Oxygenase. (080) W. J. HICKEY. Dept. of Soil Sci., Univ. of Wisconsin, Madison.
- K36.** Partial Purification of a Membrane-Bound Carbarylhydroxylase in *Pseudomonas aeruginosa* 50581. (082) S. CHAPAIAM-ADUGU\* and G. R. CHAUDHRY. Oakland Univ., Rochester, Mich.
- K37.** Cloning and Characterization of the Genes for Phthalate Degradation from *Pseudomonas cepacia* DBO1. (084) R. LIU,\* R. H. OLSEN, and G. J. ZYLSTRA. Rutgers Univ.,

- New Brunswick, N.J., and Univ. of Michigan Med. Sch., Ann Arbor.
- K38.** Preliminary Characterization and DNA Sequence Analysis of *catR*, *BCA* in *Pseudomonas putida* Biotype A. (086) T. M. BROWN,\* A. J. APPEL, E. J. HUGHES, and J. E. HOUGHTON. Dept. of Biol., Georgia State Univ., Atlanta, and Davies and Collison, Patent Attorneys, Melbourne, Australia.
- K39.** Characterization of the *pcaR* Gene from *Pseudomonas putida* (Biotype A). (088) S. ROMERO-STEINER,\* M. M. TORRES, and J. E. HOUGHTON. Dept. of Biol., Georgia State Univ., Atlanta.
- K40.** Nucleotide Sequence Analysis of the *xy/KIH* Region of the *Pseudomonas putida* TOL Plasmid pDK1. (090) X. LUO\* and M. D. WILLIAMSON. Dept. of Biol. Sci., Univ. of North Texas, Denton.
- K41.** Nucleotide Sequence of the *xy/XYZ* Region of the *Pseudomonas putida* TOL Plasmid pDK1 and Expression of the Encoded Toluolate-1,2-Dioxygenase in *Escherichia coli*. (092) D. R. HARES,\* E. AZADPOUR, and R. C. BENJAMIN. Dept. of Biol. Sci., Univ. of North Texas, Denton.
- K42.** Nucleotide Sequence, Expression, and Functional Analysis of the *xy/LT* Region from the *Pseudomonas putida* TOL plasmid pDK1. (094) R. F. BAKER,\* E. AZADPOUR, and R. C. BENJAMIN. Dept. of Biol. Sci., Univ. of North Texas, Denton.
- K43.** Cloning and Nucleotide Sequence Analysis of the *xy/GFJQ* Region of the *Pseudomonas putida* TOL Plasmid pDK1. (096) M. D. WILLIAMSON\* and X. LUO. Dept. of Biol. Sci., Univ. of North Texas, Denton.
- K44.** Biotransformation of Benzothiophene by Isopropylbenzene-Degrading Bacteria. (098) R. W. EATON\* and J. D. NITTERAUER. Environmental Res. Lab., U.S. EPA, and Technical Resources, Inc., Gulf Breeze, Fla.
- K45.** Analysis of *pcaIJ*, the *Pseudomonas putida* Operon Encoding  $\beta$ -Ketoacid Succinyl-Coenzyme A Transferase. (100) R. E. PARALES\* and C. S. HARWOOD. Univ. of Iowa, Iowa City.
- K46.** Multicomponent Nature of Biphenyl Dioxygenase from *Pseudomonas* sp. Strain LB400. (102) J. D. HADDOCK\* and D. T. GIBSON. Univ. of Iowa, Iowa City.
- K47.** Alternative Pathways for *o*-Xylene or *m*- and *p*-Xylene Degradation in a *Pseudomonas stutzeri* Strain. (104) P. BARBIERI\* and E. GALLI. Univ. degli Studi di Milano, Milan, Italy.
- K48.** Protein Engineering of Haloalkane Dehalogenase. (106) F. PRIES,\* A. J. A. C. SMAL, E. WALLAART, G. VAN POUDEROYEN, M. PENTENGA, B. WITHOLT, and D. B. JANSSEN. Dept. of Biochemistry, Univ. of Groningen, Groningen, The Netherlands.
- K49.** Degradation of Hydrochlorofluorocarbons by *Nitrosomonas europaea*. (108) M. R. HYMAN,\* S. A. ENSIGN, M. E. RASCHE, and D. J. ARP. Oregon State Univ., Corvallis, and Virginia Polytechnic Inst., Blacksburg.
- K50.** Isolation and Characterization of Polycyclic Aromatic Hydrocarbon-Degrading Bacteria from a Coal Tar-Contaminated Soil. (110) X. P. WANG\* and G. J. ZYLSTRA. Rutgers Univ., New Brunswick, N.J.
- K51.** Cloning and Characterization of the Genes for Isophthalate and Terephthalate Degradation. (112) Y. Z. WANG\* and G. J. ZYLSTRA. Rutgers Univ., New Brunswick, N.J.
- K52.** Identification of Aldehyde Dehydrogenases Involved in 1,2-Dichloroethane Degradation by *Xanthobacter autotrophicus* GJ10. (114) J. VAN DER PLOEG,\* M. P. SMIDT, A. S. LANDA, and D. B. JANSSEN. Dept. of Biochemistry, Univ. of Groningen, Groningen, The Netherlands.
- K53.** Inactivation of Ammonia Oxidation by Alkynes. (116) S. RUSSELL, M. HYMAN, and D. ARP.\* Lab. for Nitrogen Fixation Res., Oregon State Univ., Corvallis.
- K54.** Genus Identification of Two Actinomycete Parachlorophenol-Degrading Bacteria. (118) T. C. TALLANT\* and M. M. KORY. Univ. of Akron, Akron, Ohio.

## Session 118 (I). MICROBIAL METABOLISM AND PRODUCTS

- I44.** Growth of *Lactobacillus plantarum*, a Putative Biotin Auxotroph, in the Presence of Dethiobiotin. (120) W. BOWMAN\* and E. DEMOLL. Univ. of Kentucky Col. of Med., Lexington.
- I45.** Effect of Glycerol Monolaurate on Vaginal Microflora. (122) A. GESHNIZGANI,\* A. DUBOIS, M. DELANEY, and A. ONDERDONK. Brigham & Women's Hosp. and Channing Lab., Harvard Med. Sch., Boston, Mass.
- I46.** Polymyxin B Nonapeptide Permeabilization of Nontransformable Strains of *Pasteurella multocida* and *Zymomonas mobilis* to Novobiocin. (124) L. C. STEARNS,\* C. K. EDDY, and F. R. CHAMPLIN. Mississippi State Univ., Mississippi State.
- I47.** Lysine and Aerobic Growth in *Escherichia coli*. (126) H. ADLER\* and B. SUTTLE. Oak Ridge Associated Univ., Oak Ridge, Tenn.
- I48.** Periplasmic 3':5'-Cyclic AMP Phosphodiesterase in *Vibrio fischeri*: Regulation and Physiological Role. (128) P. V. DUNLAP. Woods Hole Oceanographic Inst., Woods Hole, Mass.
- I49.** Pyrimidine Utilization by *Acidovorax delafieldii*. (130) T. P. WEST and G. XU.\* South Dakota State Univ., Brookings.
- I50.** Glucose Transport and Metabolism in *Bifidobacterium breve*. (132) B. A. DEGNAN and G. T. MACFARLANE.\* MRC Dunn Clin. Nutrition Ctr., Cambridge, U.K.
- I51.** Encapsulation of Germinating *Bacillus anthracis* Spores in Serum. (134) J. EZZELL,\* T. ABSHIRE, and C. BROWN. U.S. Army Med. Res. Inst. of Infectious Diseases, Fort Detrick, Frederick, Md.
- I52.** Restrictocin Production by *Aspergillus restrictus* and *Saccharomyces cerevisiae*. (136) R. YANG,\* T. BRANDHORST, and W. R. KENEALY. Univ. of Wisconsin, Madison.
- I53.** Cloning and Expression of a Contact Hemolysin from *Mycobacterium tuberculosis* in *Escherichia coli*. (138) C. H. KING,\* M. SATHISH, T. M. SHINNICK, and J. T. CRAWFORD. CDC, Atlanta, Ga.
- I54.** Generation of Nonoxidizing Mutants of the Marine Manganese-Oxidizing *Bacillus* sp. Strain SG-1 Using Transposon Tn917. (140) L. G. VAN WAASBERGEN,\* J. A. HOCH, and B. M. TEBO. Scripps Inst. of Oceanography, Univ. of California-San Diego, and Scripps Clin. and Res. Fndn., La Jolla.
- I55.** Characterization of Two Bacteriocins from *Bacillus thermoleovorans*. (142) J. F. NOVOTNY, JR.\* and J. J. PERRY. North Carolina State Univ., Raleigh.
- I56.** Bacteriocin Production by Mosquito-Pathogenic and Nonpathogenic Strains of *Bacillus sphaericus*. (144) C. COKMUS and A. YOUSSTEN.\* Ankara Univ., Ankara, Turkey, and Virginia Polytechnic Inst. and State Univ., Blacksburg.
- I57.** Strains of *Bacillus laterosporus* Active against *Caenorhabditis elegans*. (146) H. A. CADWALLADER\* and S. SINGER. Western Illinois Univ., Macomb.
- I58.** Microbiological Studies of the Effect of Irradiated Sewage Sludge on Plant Productivity. (148) J. L. BOTSFORD,\* M. CHAVEZ-MARTIN, S. ADAM, and B. MACCASLIN. New Mexico State Univ., Las Cruces.

**Session 119 (C). FUNGI: DETECTION, IDENTIFICATION, AND ANTIMICROBIAL SUSCEPTIBILITY TESTING**

- C122. Diagnosis of Serious Candidal Infections by Complementary Dot-ImmunoBinding Assays for *Candida* Antigen and Antibody. (150) K. KIST and A. REBOLI.\* Hahnemann Univ., Philadelphia, Pa.
- C123. Serum Arabinitol Determination by Mass Spectrometry in Postoperative Deep Candidosis. (152) A. RANTALA,\* L. LEHTONEN, J. NIINIKOSKI, E. EEROLA, and O.-P. LEHTONEN. Dept. of Surgery and Dept. of Med. Microbiol., Univ. of Turku, Turku, Finland.
- C124. Evaluation of the *C. albicans*-Screen and Germ Tube Tests to Confirm Identification of *Candida albicans*. (154) A. D. SPICER\* and K. C. HAZEN. Univ. of Virginia Health Sci. Ctr., Charlottesville.
- C125. Evaluation of the Albicans-Sure Test for Identification of *Candida albicans*. (156) G. TAN, G. ORTIZ, and L. DE LA MAZA.\* Univ. of California-Irvine Med. Ctr., Orange.
- C126. Detection of Antibodies to *Coccidioides immitis* by Enzyme Immunoassay. (158) M. ZARTARIAN\* and L. M. DE LA MAZA. Univ. of California-Irvine Med. Ctr., Orange.
- C127. Prospective Comparison of Latex Agglutination Test with Enzyme Immunoassay for Detection of Cryptococcal Antigen in Patients with Cryptococcal Disease. (160) D. SHAPIRO,\* W. KELLY, K. WAIT, and P. GILLIGAN. Univ. of North Carolina Hosp., Chapel Hill.
- C128. Evaluation of the Premier Enzyme Immunoassay for Detection of Cryptococcal Antigen in Serum and Cerebrospinal Fluid. (162) N. C. LI,\* S. L. NISHIMURA, U. K. FRANK, K. SUGAI, D. M. YAJKO, W. K. HADLEY, and V. L. NG. Univ. of California and San Francisco Gen. Hosp., San Francisco.
- C129. Evaluation of the Microring YT for the Identification of Clinical Yeast Isolates. (164) K. L. MCGOWAN\* and J. E. MORTENSEN. Children's Hosp. of Philadelphia and St. Christopher's Hosp. for Children, Philadelphia, Pa.
- C130. Automatic Antifungal Activity Analyzing System Model II. I. Automatic Evaluation of Antifungal Activity of Antimycotics. (166) O. SUMITA,\* H. OHNO, H. MATSUOKA, Y. NEMOTO, K. OH, and H. KURATA. Bio-Giken Inc., Tokyo Univ. of Agriculture and Technology, and Tokyo Kembikyoin Fndn., Tokyo, Japan.
- C131. Yeast Susceptibility Assay Using a Colorimetric Endpoint Based on the Reduction of the Tetrazolium Salt XTT. (168) R. TELLIER,\* M. KRAJDEN, and I. CAMPBELL. Dept. of Microbiol., Toronto Hosp., Univ. of Toronto, Toronto, Ontario, Canada.
- C132. Comparison of Complement Fixation and Enzyme Immunoassay for Detection of Histoplasma Antibodies. (170) D. S. LELAND, E. B. CUNNINGHAM, and B. J. SMITH.\* Indiana Univ. Med. Ctr., Indianapolis.
- C133. Serologic Diagnosis of Histoplasmosis and Coccidioidomycosis Using the Premier Microwell Enzyme Immunoassay. (172) J. E. JOHNSON. VA Med. Ctr. and Univ. of Kentucky, Lexington.
- C134. A 5-Year Study on the Effects of a 5-Day versus 7-Day Protocol for Detection of Yeasts by the BACTEC NR 660. (174) K. HANSON, J. ANDERSON, R. KLICKER, and R. GRUNINGER.\* Hennepin County Med. Ctr., Minneapolis, Minn.
- C135. Comparison of Anticoagulant Blood Tubes to Isolator for the Recovery of Yeasts from Blood. (176) S. E. SHARP,\* J. M. GOODMAN, and R. J. POPPITI, JR. Mount Sinai Med. Ctr., Miami Beach, Fla.
- C136. Value of Extended Agitation-Incubation and Subculturing of BACTEC NR 660 Resin Blood Culture Bottles for

- Clinical Yeast Isolates. (178) E. PREVOST-SMITH\* and N. HUTTON. Med. Univ. of South Carolina, Charleston
- C137. Antimycotic Susceptibility Testing of Agents of Black Grain Eumycetoma. (180) P. V. VENUGOPAL\* and T. V. VENUGOPAL. Inst. of Microbiol. and Pathology, Madras Med. Col., Madras, India.
- C138. Experience with Commercial Chemiluminescent-Labeled Nucleic Acid Probes for the Identification of Dimorphic Fungi. (182) J. A. SUTTON, C. D. CAGE, A. K. KHALSA, and M. A. SAUBOLLE.\* Good Samaritan Regional Med. Ctr., Phoenix, Ariz.
- C139. Lactophenol Cotton Blue-PVA Fungal Touch Preparation. (184) R. L. HOLMES. Easton Hosp., Easton, Pa.

**Session 120 (F). FUNGAL BIOLOGY AND PATHOGENESIS**

- F45. Chitin Synthase Conserved Regions of *Sporothrix schenckii* M923-88. (186) S.-K. CHUA,\* M. MOMANY, and P. J. SZANISZLO. Univ. of Texas, Austin.
- F46. Microsomal and Permeabilized Whole-Cell Assay of (1,3)- $\beta$ -D-Glucan Synthase from *Candida albicans*. (188) D. FROST,\* K. BRANDT, J. CAPOBIANCO, and R. GOLDMAN. Abbott Lab., Abbott Park, Ill.
- F47. Glucuronoxylomannan (GXM) of *Cryptococcus neoformans* Serotype C: Structural Analysis by Gas-Liquid Chromatography-Mass Spectrometry and  $^{13}\text{C}$ -Nuclear Magnetic Resonance Spectroscopy. (190) R. CHERNIAK, L. C. MORRIS,\* and S. A. MEYER. Georgia State Univ., Atlanta.
- F48. Molecular Analysis of *Cryptococcus neoformans* var. *gattii* Isolated from *Eucalyptus camaldulensis*. (192) K. J. KWON-CHUNG,\* B. L. WICKES, L. STOCKMAN, G. D. ROBERTS, D. ELLIS, and D. H. HOWARD. NIH, Bethesda, Md.; Mayo Clin., Rochester, Minn.; Adelaide Children's Hosp., Adelaide, Australia; and UCLA, Los Angeles, Calif.
- F49. Cloning and Expression of a Gene Encoding a High-Affinity Corticosteroid Binding Protein in *Candida albicans*. (194) P. J. MALLOY\* and D. FELDMAN. Stanford Univ., Stanford, Calif.
- F50. Purification of *Candida albicans* Catalase by Isoelectric Focusing. (196) R. TOSADO-ACEVEDO,\* G. A. TORANZOS, and A. ALSINA. Biol. Dept., Univ. of Puerto Rico, Rio Piedras, Puerto Rico.
- F51. Environmental Stimuli That Induce Production of *Candida albicans* Extracellular Aspartyl Proteinase. (198) C. G. LERNER\* and R. C. GOLDMAN. Anti-Infective Res. Div., Pharmaceutical Discovery, Abbott Lab., Abbott Park, Ill.
- F52. Purification of Fatty Acid Synthase of *Candida albicans*. (200) G. E. MCELHANEY-FESER\* and R. L. CIHLAR. Georgetown Univ., Washington, D.C.
- F53. Cell Wall Anchoring to Cytoplasmic Membrane of *Candida albicans*. (202) K. C. HAZEN,\* B. W. HAZEN, and M. M. ALLIETTA. Univ. of Virginia Health Sci. Ctr., Charlottesville.
- F54. Endospore Differentiation in *Coccidioides immitis*. (204) K. SESHAN\* and G. COLE. Univ. of Texas, Austin.
- F55. Pulmonary Cryptococcosis Presenting as Metastatic Tumor in Children with Soft Tissue Sarcomas. (206) M. ALLENDE,\* P. A. PIZZO, and T. J. WALSH. Nat. Cancer Inst., Bethesda, Md.
- F56. Effect of Prior Colonization by *Staphylococcus epidermidis* on Adherence of *Candida albicans* to Vascular Catheters. (208) N. KHARDORI,\* K. WILSON, and J. RULE. Southern Illinois Univ. Sch. of Med., Springfield.
- F57. Conditions Affecting the Adherence of *Cryptococcus neoformans* to Glial and Lung Epithelial Cells. (210) G. J.

MERKEL\* and E. GANKIEWICZ. Dept. of Microbiol. and Immunology, Indiana Univ. Sch. of Med., Ft. Wayne

- F58. Inhibition of *Aspergillus fumigatus* Elastase by Elastase-Specific Monoclonal and Polyclonal Antibodies. (212) M. B. FROSCO,\* T. CHASE, JR., and J. D. MACMILLAN. Cook Col., Rutgers Univ., New Brunswick, N.J.
- F59. Pathogenicity Studies of *Nocardia asteroides* and *Nocardia farcinica*. (214) E. P. DESMOND\* and M. FLORES. California State Dept. of Health Services, Microbial Diseases Lab., Berkeley.

### Session 121 (E). CYTOKINE AND INFLAMMATORY HOST RESPONSES TO INFECTIONS

- E41. Production of Tumor Necrosis Factor Alpha by Resting Macrophages from BALB/c Mice Is Increased by Serum Albumin. (216) Z.-M. ZHENG\* and S. SPECTER. Dept. of Med. Microbiol. and Immunology, Univ. of South Florida Col. of Med., Tampa.
- E42. Potentiation of Interferon-Mediated Induction of Indoleamine 2,3-Dioxygenase in Human Macrophages. (218) B. D. HISSONG\* and J. M. CARLIN. Miami Univ., Oxford, Ohio.
- E43. Cytotoxic Effect of Lipopolysaccharide-Stimulated P388D1 Tumor Cell Culture Supernatant on Plasmacytoma. (220) F.-C. FERNG and J. TSENG.\* Dept. of Biol., Nat. Taiwan Normal Univ., Taipei, Taiwan.
- E44. Photodynamic Immunopotential: In Vivo and In Vitro Macrophage Activation by Treatment with Cyanine Dyes and Light. (222) N. YAMAMOTO, N. WILLETT,\* T. K. EISENSTEIN, D. LINDSAY, and S. HOMMA. Dept. of Biochemistry and Dept. of Microbiol. and Immunology, Temple Univ. Sch. of Med., Philadelphia, Pa.
- E45. Functional Analysis of Peritoneal Macrophages from BALB/c Mice with Leishmaniasis. (224) N. C. BEHFOROUZ, P. HALLET, and K. LAURIE.\* Dept. of Biol., Ball State Univ., Muncie, Ind.
- E46. Recombinant Macrophage Colony-Stimulating Factor Activates Rat Alveolar Macrophages To Inhibit *Cryptococcus neoformans* In Vitro. (226) G.-H. CHEN,\* M. R. GYETKO, J. L. CURTIS, P. J. CHRISTENSEN, L. R. ARMSTRONG, and G. B. TOEWS. Univ. of Michigan Med. Ctr. and VA Med. Ctr., Ann Arbor.
- E47. Dysfunctional Monocytes from a Patient with Disseminated *Mycobacterium kansasii* Infection Are Activated In Vitro and In Vivo by Granulocyte Macrophage Colony-Stimulating Factor. (228) L. E. BERMUDEZ,\* C. KEMPER, and S. C. DERESINSKI. Santa Clara Valley Med. Ctr., San Jose, Calif.; Stanford Univ., Stanford, Calif.; and Kuzell Inst., San Francisco, Calif.
- E48. Distribution of Alpha Interferon (IFN- $\alpha$ ) and IFN- $\gamma$  Immunoreactive Leukocytes in Simian Immunodeficiency Virus-Infected Monkeys. (230) D. H. WYRICK,\* P. BAINES, K. F. SOIKE, J. P. GANLEY, and M. P. LANGFORD. Louisiana State Univ. Med. Ctr., Shreveport, and Tulane Regional Primate Res. Ctr., Covington, La.
- E49. Protection of Mice from Lethal Systemic *Escherichia coli* Infection by Lipoidal Amines. (232) F. H. WEBER and D. L. EARLEY.\* Central Res. Div., Pfizer, Inc., Terre Haute, Ind.
- E50. Effects of Recombinant Interleukins on the Course of *Campylobacter jejuni* Infection and Immunity in Mice. (234) S. BAQAR,\* N. D. PACHECO, and F. M. ROLLWAGEN. Geo-Centers Inc., Fort Washington, Md., and Naval Med. Res. Inst., Bethesda, Md.
- E51. Administration of Anti-Interleukin-4 Monoclonal Antibody 11B11 Increases the Resistance of Mice to *Listeria*

*monocytogenes* Infection. (236) C. CZUPRYNSKI,\* M. HAAK-FRENDSCHO, J. BROWN, and Y. HIZAWA. Univ. of Wisconsin Sch. of Vet. Med., Madison

- E52. In Situ Studies of Cytokine mRNA Production in the Livers of Mice Infected with *Listeria monocytogenes*. (238) D. WAGNER\* and C. CZUPRYNSKI. Univ. of Wisconsin Sch. of Vet. Med., Madison.
- E53. Immunological Activity of *Helicobacter pylori* Urease. (240) U. KNIPP,\* S. BIRKHOLZ, C. NIETZKI, and W. OPFERKUCH. Ruhr-Univ., Bochum, Germany.
- E54. Delta-9-Tetrahydrocannabinol Treatment Results in Decreased Numbers of Interleukin-2 Receptors in Human and Murine Lymphocytes. (242) K. TRISLER\* and S. SPECTER. Dept. of Med. Microbiol. and Immunology, Univ. of South Florida, Col. of Med., Tampa.
- E55. Human Gingival Crevicular Fluid Cytokines in Chronic Inflammatory Periodontal Disease. (244) F. ROBERTS,\* J. KATZ, G. RICHARDSON, and S. M. MICHALEK. Univ. of Alabama, Birmingham.
- E56. Corticosteroids Act on Monocytes and HepG2 Cells To Modulate Serum Amyloid A- and C-Reactive Protein Production. (246) J. SMITH\* and T. MCDONALD. Univ. of Nebraska Med. Ctr., Omaha.
- E57. Antiendotoxin Monoclonal Antibody E5 Enhances Survival in Neutropenic Rats when Combined with Empiric Antimicrobial Therapy in *Pseudomonas* Sepsis. (248) R. L. C. ROMULO,\* S. M. OPAL, and J. E. PALARDY. Brown Univ. and Mem. Hosp., Providence, R.I.
- E58. Temperature and Seasonal Mortality-Associated Complement Deficiencies in Channel Catfish (*Ictalurus punctatus*). (250) J. R. HAYMAN,\* J. E. BLY, R. P. LEVINE, and C. J. LOBB. Dept. of Microbiol., Univ. of Mississippi Med. Ctr., Jackson, and Dept. of Genetics, Washington Univ. Sch. of Med., St. Louis, Mo.
- E59. Complement Activation by *Pseudomonas aeruginosa* Biofilms: Influence of Immune Serum. (252) E. T. JENSEN,\* T. PRESSLER, G. KRONBORG, and A. KHARAZMI. Dept. of Clin. Microbiol., Rigshospitalet, Copenhagen, Denmark.
- E60. Evaluation In Vitro of Agglutinating, Bactericidal, Opsonic, and Phagocytosis Promoting Activity of Sandoglobulin (Sandoz). (254) P. SOUTHERN,\* S. PATEL, and L. BYRD. Univ. of Texas Southwestern Med. Ctr. and Parkland Mem. Hosp., Dallas.
- E61. Differential Expression of Rheumatic Fever-Specific B-Cell Antigen on Epstein-Barr Virus-Transformed Cell Lines. (256) A. KHANNA\* and J. B. ZABRISKIE. Rockefeller Univ., New York, N.Y.
- E62. Bactericidal Effect of ADP and Beta-Lysin on *Bacillus subtilis*. (258) Y. ASENSI,\* J. FIERER, C. BORDALLO, P. RENDUELES, and S. GASCON. Oviedo Univ. Med. Sch., Oviedo, Spain, and VA Med. Ctr., San Diego, Calif.
- E63. Hypersensitivity to Microencapsulated Ampicillin in Guinea Pigs. (260) I. S. BARSOUM,\* J. R. HEATH, E. JACOB, and J. A. SETTESTROM. U.S. Army Inst. for Dent. Res., Walter Reed Army Med. Ctr., Washington, D.C.
- E64. Production of Antibodies to Antibiotics by Using Liposomes as Adjuvants. (262) M. RAVAOARINORO\* and E. TOMA. Hôtel-Dieu de Montréal and Univ. of Montreal, Montreal, Quebec, Canada.
- E65. Transfer of a Precursor of the Membrane Attack Complex of Complement between Gram-Negative Bacterial Cells. (264) D. G. SMITH and J. R. DANKERT.\* Health Sci. Ctr., Univ. of Florida, Gainesville.

**Session 122 (D). CHLAMYDIA:  
EPIDEMIOLOGY, PHYSIOLOGY, AND  
IMMUNOLOGY**

- D65.** Comparative Gene Variant Regions of the Major Outer Membrane Protein for B/Ba Isolates: a Molecular Epidemiological Approach to Ocular *Chlamydia trachomatis* Infections. (266) D. DEAN,\* J. SCHACHTER, C. DAWSON, and R. S. STEPHENS. Francis I. Proctor Fndn., Univ. of California, San Francisco.
- D66.** Swine Perinatal Chlamydiosis. (268) E. K. DANIELS\* and N. E. WOOLLEN. USDA, Agricultural Res. Service, U.S. Meat Animal Res. Ctr., Clay Center, Nebr.
- D67.** Detection of *Chlamydia pneumoniae* in the Coronary Artery Atheroma Plaque. (270) A. SHOR, C. C. KUO,\* D. L. PATTON, H. FUKUSHI, and L. A. CAMPBELL. Nat. Ctr. for Occupational Health, Johannesburg, South Africa, and Univ. of Washington, Seattle.
- D68.** A New *Chlamydia psittaci* Serotype Associated with Pigeons. (272) A. A. ANDERSEN. USDA, Agricultural Res. Service, Nat. Animal Disease Ctr., Ames, Iowa.
- D69.** *Chlamydia trachomatis* Is Auxotrophic for Three of the Four Nucleoside Triphosphates. (274) G. TIPPLES\* and G. A. MCCLARTY. Univ. of Manitoba, Winnipeg, Manitoba, Canada.
- D70.** *Chlamydia* Strains Synthesize Folates De Novo. (276) H. FAN,\* G. A. MCCLARTY, and R. C. BRUNHAM. Univ. of Manitoba, Winnipeg, Manitoba, Canada.
- D71.** A Promoter-Detecting Transposable Element That Employs Bacterial Luciferase and Has a Host Range That Includes *Chlamydia trachomatis*. (278) J. E. TAM\* and P. B. WYRICK. Dept. of Microbiol. and Immunology, Univ. of North Carolina, Chapel Hill.
- D72.** Cloning and Sequence Analysis of a 41-kDa Polypeptide from *Chlamydia trachomatis*. (280) R. KAUL,\* R. U. MEUSER, and W. M. WENMAN. Dept. of Pediatrics, Univ. of Alberta, Edmonton, Alberta, Canada.
- D73.** Histone Analogs in *Chlamydia trachomatis*. (282) E. VRETOU\* and S. K. BOSE. Hellenic Pasteur Inst., Athens, Greece.
- D74.** Molecular Cloning and Expression of the Developmentally Regulated 32-kDa Histone Analog of *Chlamydia trachomatis* Serotype L2. (284) T. J. BRICKMAN,\* D. ROCKEY, and T. HACKSTADT. Lab. of Intracellular Parasites, Rocky Mountain Lab., Nat. Inst. of Allergy and Infectious Diseases, Hamilton, Mont.
- D75.** Expression of the 18-kDa Chlamydial Histone Analog in *Escherichia coli*. (286) C. E. BARRY III\* and T. HACKSTADT. Lab. of Intracellular Parasites, Rocky Mountain Lab., Nat. Inst. of Allergy and Infectious Diseases, Hamilton, Mont.
- D76.** Characterization and Localization of a *Chlamydia trachomatis* Protein Involved in Attachment to Human Epithelial Cells. (288) J. RAULSTON,\* S. KNIGHT, D. SCHMIEL, C. DAVIS, and P. B. WYRICK. Univ. of North Carolina Sch. of Med., Chapel Hill.
- D77.** Phospholipase A2 Activity Associated with Immediate Cytotoxicity of Chlamydiae. (290) S. AWASTHI,\* H. SU, and T. HACKSTADT. Lab. of Intracellular Parasites, Rocky Mountain Lab., Nat. Inst. of Allergy and Infectious Diseases, Hamilton, Mont.
- D78.** Indoleamine 2,3-Dioxygenase Induction in Macrophages Infected with *Chlamydia psittaci*. (292) A. M. PAGUIRIGAN\* and J. M. CARLIN. Miami Univ., Oxford, Ohio.
- D79.** *Chlamydia trachomatis* Pneumonia in the Severe Combined Immunodeficiency Mouse. (294) D. M. WILLIAMS,\* D. M. MAGEE, J. G. SMITH, C. A. BLEICKER, and J. SCHACHTER. Audie L. Murphy VA Hosp. and Univ. of Texas Health Sci. Ctr., San Antonio, and Univ. of California, San Francisco.
- D80.** Characterization of a Neutralizable Epitope Located in the Variable Domain 3 of the Major Outer Membrane Protein of *Chlamydia trachomatis*. (296) S. PAL,\* X. CHENG, E. M. PETERSON, and L. M. DE LA MAZA. Univ. of California, Irvine.
- D81.** Serological Response to *Chlamydia pneumoniae* in Patients with Sarcoidosis. (298) M. PUOLAKKAINEN,\* I. A. CAMPBELL, C. C. KUO, M. LEINONEN, C. GRONHAGEN-RISKA, and P. SAIKKU. Univ. of Washington, Seattle, and Nat. Publ. Health Inst. and Univ. of Helsinki, Helsinki, Finland.
- D82.** Expression and Immunological Characterization of a Synthetic Gene Coding for the Major Outer Membrane Protein of *Chlamydia trachomatis*. (300) H. M. JONES\* and R. S. STEPHENS. Univ. of California, San Francisco.
- D83.** Protective Effect of HeLa Cell Extract on Elementary Bodies of *Chlamydia trachomatis* biovar L2. (302) G. BOGUSLAWSKI\* and A. M. LEMONTE. Indiana Univ. Sch. of Med., Indianapolis.
- D84.** Effects of Macrophages and Cytokines upon *Chlamydia trachomatis* Infection In Vitro. (304) B. CHEN,\* R. D. STOUT, and W. F. CAMPBELL. East Tennessee State Univ., Johnson City.
- D85.** Measurement of Human C3 Binding to *Chlamydia trachomatis* by Flow Cytometry. (306) R. T. HALL,\* X. WU, T. STRUGNELL, D. V. DEVINE, and H. G. STIVER. Univ. of British Columbia, Vancouver, British Columbia, Canada.
- D86.** Reactivation of Persistent *Chlamydia trachomatis* Genital Infection in Mice. (308) K. R. TAU-CODY,\* H. WANG, B. CHEN, J. SUTTLES, and W. F. CAMPBELL. East Tennessee State Univ., Johnson City.
- D87.** Cost-Effective Strategies for Managing Chlamydial Infection in Pregnancy. (310) J. LOVCHIK,\* J. HUDSON, R. HEBEL, and L. ALGER. Univ. of Maryland Med. Sch., Baltimore.

**Session 123 (D). INTRACELLULAR  
PATHOGENS: RICKETTSIA, COXIELLA, AND  
EHRlichia**

- D88.** Isolation of a New Rickettsia from Patients with Flinders Island Spotted Fever: Characterization and Comparison of the Isolate. (312) R. W. BAIRD,\* M. LLOYD, B. ROSS, J. STENOS, S. GRAVES, and B. DWYER. Fairfield Hosp., Fairfield, Victoria, Australia.
- D89.** *Rickettsia australis* Infection of BALB/c Mice: a Highly Invasive Vasculopathic Model of SFG Rickettsiosis. (314) D. H. WALKER,\* J. WEN, and H. M. FENG. Univ. of Texas Med. Branch, Galveston.
- D90.** Antigenic Variation among Prototype and Recent Isolates of *Rickettsia tsutsugamushi* from Thailand. (316) G. DASCH,\* M. MOREE, D. KELLY, D. STRICKMAN, P. TANSKUL, C. EAMSILA, P. WATCHARAPICHAT, and B. HANSON. Naval Med. Res. Inst., Bethesda, Md.; Univ. of Maryland Med. Sch., Baltimore; and Armed Forces Res. Inst. for Med. Sci., Bangkok, Thailand.
- D91.** Detection of *Rickettsia tsutsugamushi* by Polymerase Chain Reaction Amplification of Its Conserved 47-kDa Major Surface Protein Antigen Gene. (318) A. RICHARDS,\* L. JACKSON, and M. MOREE. Naval Med. Res. Inst., Bethesda, Md., and Univ. of Maryland Med. Sch., Baltimore.
- D92.** Strain Variation among Prototype and Recent *Rickettsia tsutsugamushi* Isolates Using Polymerase Chain Reaction and Restriction Fragment Length Polymorphism Analysis of the

- 56-kDa Protein Antigen Gene. (320) D. KELLY,\* G. DASCH, K. SWINSON, D. STRICKMAN, P. TANSKUL, C. EAMSILA, P. WATCHARAPICHAT, and S. OAKS, JR. Naval Med. Res. Inst., Bethesda, Md.; Armed Forces Res. Inst. for Med. Sci., Bangkok, Thailand; and Inst. of Med., Nat. Academy of Sci., Washington, D.C.
- D93. Diagnostic Potential of Recombinant *Rickettsia tsutsugamushi* 56-kDa Protein. (322) S.-Y. SEONG, S.-G. WOO, I.-S. KIM, and W.-H. CHANG.\* Seoul National Univ. and Green Cross Ltd., Seoul, Korea.
- D94. Differential Regulation of *Rickettsia rickettsii ompA* and *ompB* Expression by Promoter and 5' Untranslated Regions. (324) P. F. POLICASTRO. Lab. of Intracellular Parasites, Rocky Mountain Lab., Nat. Inst. of Allergy and Infectious Diseases, Hamilton, Mont.
- D95. Characterization of the *Rickettsia prowazekii* Major Macromolecular Synthesis Operon. (326) G. L. MARKS\* and D. O. WOOD. Univ. of South Alabama Col. of Med., Mobile.
- D96. Isolation of the Putative *recA* Gene of *Rickettsia prowazekii*. (328) S. M. DUNKIN\* and D. O. WOOD. Univ. of South Alabama Col. of Med., Mobile.
- D97. Effect of Temperature on the Intracellular Growth of *Rickettsia conorii* Assayed by a New Approach, Flow Cytometry. (330) H. M. FENG\* and D. H. WALKER. Univ. of Texas Med. Branch, Galveston.
- D98. Growth of *Rickettsia prowazekii* in Cell Lines Which Differ in Their Responses to Interferon. (332) J. TURCO\* and H. H. WINKLER. Lab. of Molecular Biol., Univ. of South Alabama Col. of Med., Mobile.
- D99. Localization of Antigenic Determinants within the Repeating Units of the Outer Membrane Protein A of the Spotted Fever Group Rickettsiae. (334) R. D. GILMORE, JR. Rocky Mountain Laboratories, Nat. Inst. of Allergy and Infectious Diseases, Hamilton, Mont.
- D100. Human Immune Response to Overlapping Peptides of the 47-kDa Protein Antigen of *Rickettsia tsutsugamushi*. (336) M. MOREE\* and W.-M. CHING. Univ. of Maryland, Baltimore, and Naval Med. Res. Inst., Bethesda, Md.
- D101. Genomic Grouping of *Coxiella burnetii* Isolates from Czechoslovakia, Poland, and the USSR. (338) D. VALKOVA,\* J. KAZAR, J. URVOLGYI, S. SCHMITT, and L. P. MALLAVIA. Inst. of Virology, Bratislava, C.S.F.R., and Washington State Univ., Pullman.
- D102. Cloning and Sequencing of the *Coxiella burnetii* Outer Membrane Protein Gene, *com1*. (340) L. HENDRIX,\* L. MALLAVIA, and J. SAMUEL. MicroCarb Inc., Gaithersburg, Md., and Washington State Univ., Pullman.
- D103. A *Coxiella burnetii* Immunodominant Antigen Is Heat Shock Induced. (342) L. NORLANDER\* and A. MACELLARO. Dept. of Microbiol., Nat. Defence Res. Establ., Umea, Sweden.
- D104. T-Cell Hybridomas Reactive to *Coxiella burnetii*: Initial Characterization. (344) J. SESHU,\* K. L. MCIVOR, and L. P. MALLAVIA. Washington State Univ., Pullman.
- D105. Presence of Parasite Antigens on the Surface of P388D<sub>1</sub> Cells Infected with *Ehrlichia risticii*. (346) J. MESSICK\* and Y. RIKIHISA. Ohio State Univ., Columbus.
- D106. L-Arginine-Dependent Killing of *Ehrlichia risticii* in Macrophages Treated with Gamma Interferon. (348) J. PARK\* and Y. RIKIHISA. Ohio State Univ., Columbus.
- (350) S. SCRIVER,\* B. WILLEY, and A. E. SIMOR. Mount Sinai Hosp., Univ. of Toronto, Toronto, Ontario, Canada
- A78. Antimicrobial Susceptibilities of New Fluoroquinolones CI-960 (PD 127391) and CI-990 (PPD 131628) and Nine Other Antibiotics against *Pseudomonas aeruginosa*, *Xanthomonas maltophilia*, and *Pseudomonas* spp. (352) A. FORD,\* W. RITZ, and R. P. SMITH. VA Med. Ctr. and Albany Med. Col., Albany, N.Y.
- A79. In Vitro Activity of CI-960 and PD131628-2 against 339 Anaerobic Bacteria. (354) E. MOLITORIS,\* D. REEVES, and H. WEXLER. UCLA Sch. of Med. and VA Wadsworth Med. Ctr., Los Angeles, Calif.
- A80. In Vitro Activity of Lomefloxacin Mesylate Salt. (356) R. A. VENEZIA and D. M. YOCUM.\* Albany Med. Ctr., Albany, N.Y.
- A81. In Vitro Activity of Fleroxacin Compared with Other Quinolones and Unrelated Agents. (358) Y. MCCARTER,\* M. MAZENS-SULLIVAN, and R. BARTLETT. Hartford Hosp., Hartford Hosp., Hartford, Conn.
- A82. Comparative Activities of Seven Fluoroquinolone Antibiotics against *Streptococcus pneumoniae*. (360) J. H. JORGENSEN, L. A. MAHER, and M. L. MCELMEEL.\* Univ. of Texas Health Sci. Ctr., San Antonio.
- A83. Comparative Susceptibility of Ofloxacin and Other Oral Antibiotics in the United States: a Forty-Medical-Center Controlled Investigation. (362) R. N. JONES\* and M. E. ERWIN. Univ. of Iowa Col. of Med., Iowa City.
- A84. Canadian Ofloxacin Susceptibility Study: Comparative Study from 19 Medical Centers. (364) D. HOBAN\* and THE OFLOXACIN STUDY GROUP. Univ. of Manitoba, Winnipeg, Manitoba, Canada.
- A85. In Vitro Interaction of Levofloxacin with Phosphomycin against *Pseudomonas aeruginosa* and Staphylococci. (366) B. FOLENO and K. P. FU.\* R.W. Johnson Pharmaceutical Res. Inst., Raritan, N.J.
- A86. In Vitro Interaction of a New Oxazine Quinolone, Levofloxacin, and Azidothymidine. (368) B. FOLENO\* and K. P. FU. R.W. Johnson Pharmaceutical Res. Inst., Raritan, N.J.
- A87. DNA Gyrase Inhibitory and Antibacterial Activity of Flavone Compounds. (370) K. A. OHEMENG, C. F. SCHWENDER, K. P. FU, and J. F. BARRETT.\* R. W. Johnson Pharmaceutical Res. Inst., Raritan, N.J.
- A88. Bactericidal Effect of Temafloxacin versus Ciprofloxacin against *Streptococcus pneumoniae* at Clinically Relevant Concentrations. (372) S. K. TANAKA, J. BEYER,\* A. PERNET, and J. CLEMENT. Abbott Lab., Abbott Park, Ill.
- A89. Enhanced Potency of Temafloxacin and Ofloxacin against Ciprofloxacin-Resistant Staphylococci and *Enterobacteriaceae*. (374) K. S. THOMSON, M. E. HAYDEN, C. C. SANDERS,\* and I. TRUJILLANO. Creighton Univ. Sch. of Med., Omaha, Nebr., and Dept. of Microbiol. and Parasitology, Hosp. Clin. Univ., Salamanca, Spain.
- A90. Porin D2 Affinity of Quinolones in *Pseudomonas aeruginosa*: Structure-Activity Relationship and Contribution to Antibacterial Activity. (376) Y. X. FURET,\* M. MICHEA-HAMZEHPOUR, and J.-C. PECHERE. Dept. of Microbiol., Univ. of Geneva, Geneva, Switzerland.
- A91. Transport of Pefloxacin across the Bacterial Cytoplasmic Membrane. (378) Y. X. FURET\* and J.-C. PECHERE. Dept. of Microbiol., Univ. of Geneva, Geneva, Switzerland.
- A92. Comparative In Vitro Activities of Fleroxacin and 11 Other Antibiotics against Bacterial Isolates from a Tertiary Care Hospital. (380) K. B. WAITES\* and K. C. CANUPP. Univ. of Alabama, Birmingham.

## Session 124 (A). SUSCEPTIBILITY TO QUINOLONES

- A77. Comparative In Vitro Activity of New Fluorinated Quinolones, CI-960 and PD-131628, against Staphylococci.



## GENERAL MEMBERSHIP MEETING

Thursday, 12:00 Noon, Room 5

All Society members are urged to attend and take part in the discussion of Society activities and business.

### Session 125 (C). Round Table

(Eligible for continuing education credit)

## CASE PRESENTATIONS IN CLINICAL MICROBIOLOGY

Thursday, 1:30 P.M., Ballroom IB

*Convenors:* ROBERTA B. CAREY, St. Francis Hosp., Evanston, Ill., and KARIN MCGOWAN, Children's Hosp., Philadelphia, Pa.

Twelve clinical cases will be presented by the panelists in the areas of bacteriology, parasitology, mycology, mycobacteriology, and virology. Following the presentation of each case, one of the panelists or the audience will attempt to identify the mystery pathogen or explain the unusual laboratory findings. The audience will be encouraged to contribute their own experiences with like cases. The cases presented will highlight common problems in clinical microbiology and "tricks of the trade" to take home and use in one's own laboratory setting.

*Participants:* JOSEPH CAMPOS, ROBERTA CAREY, PETER GILLIGAN, KARIN MCGOWAN, DAVID WELCH, and MARY YORK

### Session 126 (C). Seminar

(Eligible for continuing education credit)

## ALTERNATIVE APPROACHES FOR DETERMINING MICs

Thursday, 1:30 P.M., Room 20

*Convenors:* DANIEL AMSTERDAM and THERESA LAWRENCE, SUNY at Buffalo, Buffalo, N.Y.

The MIC: Myth and Reality  
DANIEL AMSTERDAM, SUNY at Buffalo, Buffalo, N.Y.

Disk Diffusion Susceptibility Tests with Anaerobic Bacteria  
ARTHUR L. BARRY, Clin. Microbiol. Inst., Inc., Tualatin, Oreg.

The BIOMIC Antimicrobial System  
ROBERT L. SAUTTER, Harrisburg Hosp., Harrisburg, Pa.

The E Test  
JOHN A. WASHINGTON II, Cleveland Clin. Fndn., Cleveland, Ohio

The Spiral Gradient Endpoint System  
HANNAH M. WEXLER, VA Wadsworth Med. Ctr., Los Angeles, Calif.

### Session 127 (I). Symposium

(Eligible for continuing education credit)

## CYSTIC FIBROSIS: A GENETIC DISEASE AND ITS IMMUNOLOGICAL AND MICROBIOLOGICAL CONSEQUENCES

Thursday, 1:30 P.M., Room 10

*Convenors:* BARBARA H. IGLEWSKI, Univ. of Rochester Sch. of Med., Rochester, N.Y., and STEPHEN A. LERNER, Wayne State Univ., Detroit, Mich.

Structure and Function of CFTR Proteins  
MICHAEL WELSH, Univ. of Iowa, Iowa City

New Therapeutic Approaches to the Treatment of Cystic Fibrosis  
ROBERT J. BEALL, Cystic Fibrosis Fndn., Bethesda, Md.

Inflammation and Local Immune Dysfunction in Cystic Fibrosis  
MELVIN BERGER, Case Western Reserve Univ., Cleveland, Ohio

*Pseudomonas aeruginosa* Infections and Virulence Factors  
BARBARA H. IGLEWSKI, Univ. of Rochester, Rochester, N.Y.

Environmental Regulation of *Pseudomonas aeruginosa* Alginate and Potential Alginate Inhibitors  
ANANDA CHAKRABARTY, Univ. of Illinois Col. of Med., Chicago

### Session 128 (H). Seminar

(Eligible for continuing education credit)

## PROTEIN EXPORT IN *ESCHERICHIA COLI*: THE GENETIC APPROACH

(Organized by Phil Bassford and dedicated to his memory)

Thursday, 1:30 P.M., Room 37

*Convenors:* TOM SILHAVY, Princeton Univ., Princeton, N.J., and DON OLIVER, Wesleyan Univ., Middletown, Conn.

The Role of SecB in Maltose-Binding Protein Export  
SHARON STROBEL and PHIL BASSFORD, Univ. of North Carolina, Chapel Hill

Novel Activities of the SecA ATPase and Their Relevance to Protein Export  
DON OLIVER, Wesleyan Univ., Middletown, Conn.

Integral Membrane Components of the Sec Pathway  
CHRIS MURPHY, Harvard Med. Sch., Boston, Mass.

The Protein Secretion Pathway Revealed by Suppressors  
TOM SILHAVY, Princeton Univ., Princeton, N.J.

Structure, Function, and Membrane Assembly of Leader Peptidase  
ROSS DALBY, Ohio State Univ., Columbus

**Session 129 (J, K). Seminar**  
(Eligible for continuing education credit)

**PHYSIOLOGICAL STUDIES OF LIVING  
BACTERIAL BIOFILMS**

Thursday, 1:30 P.M., Room 39

Convenors: J. W. COSTERTON, Univ. of Calgary, Calgary, Alberta, Canada, and M. R. W. BROWN, Aston Univ., Birmingham, U.K.

Use of Specific Probes and Confocal Scanning Microscopy To Study the Physiology of Living Biofilms In Situ  
D. E. CALDWELL, Univ. of Saskatchewan, Saskatoon, Saskatchewan, Canada

Use of Physicochemical Methods To Study the Physiology of Living Biofilms  
G. G. GEESEY, Montana State Univ., Bozeman

Variations in the Growth Rates of Biofilm Bacteria: Their Physiological Corollaries  
P. GILBERT, Univ. of Manchester, Manchester, England

Killing Biofilm Bacteria with a Combination of Antibiotics and Electrical Fields  
J. W. COSTERTON, Univ. of Calgary, Calgary, Alberta, Canada

**Session 130 (I)**

**MICROBES IN THE ENVIRONMENT**

Thursday, 1:30 P.M., Room 41

Moderators: J. S. POINDEXTER, Barnard Col., New York, N.Y., and MARY ALLEN, Florida State Univ., Tallahassee

1:30 Divisional Lecture  
(Eligible for continuing education credit)

Microbial Life in Diverse Subsurface Environments  
DAVID BALKWILL, Florida State Univ., Tallahassee

2:30

I59. Phylogenetic Analysis of Iron Sulfide- and Magnetite-Producing Magnetotactic Bacteria from Brackish, Sulfidic Aquatic Habitats. D. A. BAZYLINSKI,\* R. B. FRANKEL, and E. F. DELONG. Virginia Polytechnic Inst. and State Univ., Blacksburg; California Polytechnic State Univ., San Luis Obispo; and Marine Science Inst., Univ. of California, Santa Barbara.

I60. Cyanobacteria as Dominant Primary Producers in the Gobi Desert: Biomass and Abundance. M. E. ALLEN\* and E. I. FRIEDMANN. Florida State Univ., Tallahassee.

I61. Diurnal Nitrogen Cycling in Microbial Mats Inhabiting Thermal Acid Springs. R. L. MANCINELLI\* and M. R. WHITE. NASA-Ames Res. Ctr., Moffett Field, Calif.

I62. Antimicrobial Substances of Antarctic Cryptoendolithic Fungi. R. OCAMPO-FRIEDMANN,\* E. I. FRIEDMANN, and A. S. HODGE. Florida A&M Univ. and Florida State Univ., Tallahassee.

3:30

I63. Microbial Community Nutritional Analysis in a Basalt Aquifer. M. ZHENG\* and S. T. KELLOGG. Dept. of Bacteriol. and Biochemistry, Univ. of Idaho.

I64. Limit of Survival of *Azotobacter* spp. in Dry Soils Stored in the Laboratory. V. NEVAREZ\* and R. VELA. Univ. of North Texas, Denton.

I65. Use of Autoradiography To Determine Viable but Nonculturable *Helicobacter pylori* in Water. M. SHAHAMAT,\* U. E. H. MAI, C. PASZKO-KOLVA, M. KESSEL, and R. R. COLWELL. Univ. of Maryland, College Park.

I66. Growth Characteristics of Cellulolytic Halophilic Bacteria Isolated from Hypersaline Lakes and the WIPP Underground Workings. A. PISELLI, JR.,\* R. VREELAND, and S. MYERS. West Chester Univ., West Chester, Pa.

4:30

I67. Mineralization of Eight Polycyclic Aromatic Compounds in a Hydrocarbon-Contaminated Soil. R. J. GROSSER,\* D. WARSHAWSKY, and J. R. VESTAL. Univ. of Cincinnati, Cincinnati, Ohio.

**Session 131 (F)**

**PATHOGENESIS OF FUNGAL INFECTIONS**

Thursday, 1:30 P.M., Room 26

Moderators: K. J. KWON-CHUNG, Nat. Inst. of Allergy and Infectious Diseases, Bethesda, Md., and K. V. CLEMONS, Stanford Univ., San Jose, Calif.

1:30 Divisional Lecture  
(Eligible for continuing education credit)

Cloning and Functional Analysis of Fungal Pathogenic Genes  
OLEN C. YODER, Cornell Univ., Ithaca, N.Y.

2:30

F60. Evolutionary Origins of Human Pathogenic Fungi. B. BOWMAN,\* J. W. TAYLOR, and T. J. WHITE. Roche Molecular Systems, Alameda, Calif., and Univ. of California, Berkeley.

F61. Biolistic High-Frequency Integrative Transformation of *Cryptococcus neoformans*. D. L. TOFFALETTI,\* J. R. PERFECT, T. H. RUDE, S. A. JOHNSTON, and D. T. DURRACK. Duke Univ. Med. Ctr., Durham, N.C., and Southwestern Med. Ctr., Dallas, Tex.

F62. Purification of an Immunosuppressive Component from *Cryptococcus neoformans* by Electrophoretic Techniques. D. SALGADO-CASTRO and B. BOLANOS.\* Dept. of Microbiol., Sch. of Med., Univ. of Puerto Rico, San Juan, Puerto Rico.

F63. Reversal of Cell-Division-Cycle Arrest in *Wangiella dermatitidis*. S. M. KARUPPAYIL, L. MENDOZA, and P. J. SZANISZLO.\* Univ. of Texas, Austin.

3:30

F64. Comparative Pathogenesis of Clinical and Nonclinical Isolates of *Saccharomyces cerevisiae*. K. V. CLEMONS,\* J. H. MCCUSKER, R. W. DAVIS, and D. A. STEVENS. Califor-

THURSDAY

nia Inst. of Med. Res., Santa Clara Valley Med. Ctr., San Jose, and Stanford Univ., Stanford, Calif.

**F65.** Thiol-Mediated Regulation of Yeast-to-Mycelial Transition in *Candida albicans*. E. K. MANAVATHU,\* N. OBE-DEANU, and J. D. SOBEL. Wayne State Univ., Detroit, Mich.

**F66.** *Candida* Adherence Is a Calcium-Dependent Event Mediated by Fungal Surface Glycoproteins. S. A. KLOTZ\* and S. R. BABCOCK. VA Med. Ctr., Kansas City, Mo.

**F67.** Possible Role of an Alkaline  $\beta$ -1,3-Glucosidase Isolated from *Coccidioides immitis*. D. KRUSE,\* K. SESHAN, M. BARLETT, and G. COLE. Univ. of Texas, Austin.

4:30

**F68.** Immunochemical Detection of Mannan in *Pneumocystis carinii*. R. E. GARNER,\* A. N. WALKER, and M. H. HORST. Mercer Univ. Sch. of Med., Macon, Ga.

### Session 132 (BET). Round Table

(Eligible for continuing education credit)

## UNSOLVED PROBLEMS IN TEACHING MICROBIOLOGY

Thursday, 1:30 P.M., Room 103

*Convenors:* JUDITH KANDEL, California State Univ., Fullerton, and JILL ADLER-MOORE, California Polytechnic Inst., Pomona

Microbiology educators face the task of communicating scientific concepts, developing laboratory skills, and stimulating critical thinking skills as they relate to microbiology. We face a diverse population of students in courses ranging from introductory microbiology to upper-division and graduate specialty courses. Faculty members and students often complain that the traditional approaches to teaching microbiology do not achieve the course objectives. The participants will briefly discuss some techniques that have improved their courses. The session then will be opened for discussions of basic problem areas. Attendees are encouraged to present problems specific to their courses. The panel and audience will attempt to solve these problems.

*Participants:* J. P. ADLER-MOORE, J. BENNETT, D. BURKE, R. A. CALDERONE, J. S. KANDEL, and J. E. LENNOX

### Session 133 (V). Seminar

(Eligible for continuing education credit)

## NEW THERAPEUTIC ADVANCES IN INFECTIOUS DISEASES AND MALIGNANCY

Thursday, 1:30 P.M., Room 13

*Convenors:* BARBARA DETRICK, George Washington Univ. Med. Ctr., Washington, D.C., and STANLEY COHEN, Hahnemann Univ. Sch. of Med., Philadelphia, Pa.

### Divisional Lecture Abbott Award Lecture

Immunotoxins in the Therapy of Cancer  
ELLEN S. VITETTA, Univ. of Texas Southwestern Med. Ctr., Dallas

Frontier in Vaccine Development: New Approaches for a Malaria Vaccine  
CARL ALVING, Walter Reed Army Inst. of Res., Washington, D.C.

Progress in Interferon Therapy: Applications for Cancer and Virus Infections  
SAMUEL BARON, Univ. of Texas Med. Branch, Galveston

Novel Antiviral Agents for Human Immunodeficiency Virus and Herpesvirus Infections  
DANIEL MERUELO, NYU Med. Ctr., New York, N.Y.

Potential of Gene Therapy for Infectious Diseases and Malignancy  
KENNETH CULVER, Nat. Cancer Inst., Bethesda, Md.

### Session 134 (L, C). Seminar

(Eligible for continuing education credit)

## QUANTITATIVE CULTURES IN HOSPITAL-ACQUIRED INFECTIONS

Thursday, 1:30 P.M., Room 2

*Convenors:* MICHAEL A. PFALLER, Oregon Health Sci. Univ., Portland, and BRYAN SIMMONS, Univ. of Tennessee, Memphis

The Value of Quantitative Cultures in the Diagnosis of Pneumonia  
GLEN MAYHALL, Univ. of Tennessee Sch. of Med., Memphis

Quantitative Cultures in the Diagnosis of Bloodstream and Vascular Device-Related Infections  
MICHAEL A. PFALLER, Oregon Health Sci. Univ., Portland

The Epidemiologic Usefulness of Surveillance Cultures in Hospitalized Patients  
WILLIAM JARVIS, CDC, Atlanta, Ga.

Quantitative Cultures of Wounds and Soft Tissue  
JOHN E. MCGOWAN, JR., Grady Mem. Hosp., Atlanta, Ga.

Pathogenic Airborne Fungal Spore Counts: Establishment of Appropriate Standards  
FRANK RHAME, Univ. of Minnesota, Minneapolis

**Session 135 (E). Seminar**  
(Eligible for continuing education credit)

**SUPERANTIGENS AND THE IMMUNE SYSTEM**

Thursday, 1:30 P.M., Room 21

*Convenors:* THOMAS J. ROGERS, Temple Univ. Sch. of Med., Philadelphia, Pa., and BARRY C. COLE, Univ. of Utah Sch. of Med., Salt Lake City

Antigens and Superantigens for T-Cell Responses  
CHARLES A. JANEWAY, JR., Yale Univ. Sch. of Med., New Haven, Conn.

Structural Basis for the Interaction of Staphylococcal Enterotoxins with the Major Histocompatibility Complex and the T-Cell Receptor  
HOWARD M. JOHNSON, Univ. of Florida, Gainesville

Role of Interleukin-1 and Interleukin-6 in the Stimulation of T-Cells by Staphylococcal Enterotoxin B  
THOMAS J. ROGERS, Temple Univ. Sch. of Med., Philadelphia, Pa.

Polyclonal B-Cell Activation In Vivo and Triggering of Autoimmune Disease by the *Mycoplasma arthritidis* Superantigen (MAM)  
BARRY C. COLE, Univ. of Utah Sch. of Med., Salt Lake City

Signal Transduction by Microbial Superantigens via Major Histocompatibility Complex Class II Molecules  
TALAL CHATILA, Harvard Med. Sch., Boston, Mass.

**Session 136. Divisional Group III Symposium**  
(Eligible for continuing education credit)

**APPLICATIONS OF MODELING IN MICROBIOLOGY**

Thursday, 1:30 P.M., Room 27

*Convenors:* CHRISTON J. HURST, U.S. EPA, Cincinnati, Ohio, and MARYLYNN V. YATES, Univ. of California, Riverside

Mathematical Modelers versus Experimental Biologists: Can Common Ground Be Found?  
JOSEPH A. ROBINSON, Upjohn Co., Kalamazoo, Mich.

Microbial Risk Assessment  
JOAN B. ROSE, Univ. of South Florida, Tampa

Modeling Growth in Food Systems  
ROBERT L. BUCHANAN, USDA, Agricultural Res. Service, Philadelphia, Pa.

Modeling Microbial Processes in the Subsurface: Experiments with a Microbial Process To Recover Oil  
MICHAEL J. MCINERNEY and ROY M. KNAPP, Univ. of Oklahoma, Norman

Computer Simulation of Fungal Growth and Morphogenesis: a Simple Mathematical Model Explains the Probable Origin of Fungal Shapes

SALOMON BARTNICKI-GARCIA, Univ. of California, Riverside

**Session 137 (C). Seminar**  
(Eligible for continuing education credit)

**MULTIDRUG-RESISTANT MYCOBACTERIUM TUBERCULOSIS**

Thursday, 1:30 P.M., Room 16

*Convenors:* MICHAEL H. CYNAMON, VA Med. Ctr., Syracuse, N.Y., and SALLY P. KLEMENS, SUNY Health Sci. Ctr., Syracuse, N.Y.

Epidemiology of Multidrug Resistance in the United States  
SAMUEL W. DOOLEY, CDC, Atlanta, Ga.

Impact of Multidrug Resistance at an Urban Hospital  
MICHAEL H. GRIECO, St. Lukes-Roosevelt Hosp. Ctr., New York, N.Y.

Use of DNA Fingerprints as Markers for the Epidemiologic Study of Multiply Drug-Resistant Tuberculosis  
GERALD MAZUREK, Univ. of Texas Health Ctr., Tyler

Rapid Diagnosis and Susceptibility Testing  
EDWARD DESMOND, California Dept. of Health Services, Berkeley

Mechanisms of Resistance and Future Prospects for Therapy  
MICHAEL H. CYNAMON, VA Med. Ctr., Syracuse, N.Y.

**Session 138 (PSAB). Round Table**  
(Eligible for continuing education credit)

**THE DISCOVERY PROCESS**

Thursday, 1:30 P.M., Room 85

*Convenors:* WINSTON J. BRILL, Winston J. Brill & Associates, Madison, Wis., and THOMAS WHITE, Roche Diagnostics Res., Alameda, Calif.

The purpose of this meeting is to induce members of the audience to be more introspective about the way they go about their research. Seminars and publications rarely discuss personal events leading to a discovery. However, these events frequently play just as important a role as accumulation and analysis of scientific data. Therefore, in order to appreciate and perhaps stimulate the discovery process, the human side should be kept in mind as we pursue our own and manage others' R&D activities. The meeting will bring out interesting events that were essential to several diverse discoveries and their development. After a brief introduction to the meeting by the convenor, each participant will discuss how a discovery evolved. The subjects covered are: Augmentin, microbiology of an oil spill, magnetotactic bacteria, CellCap, and polymerase chain reaction. After the last talk, the meeting will be open to discussion and comments from the audience.

THURSDAY

Participants: R. E. CHRISTOFFERSEN, S. M. HINTON, R. BLAKEMORE, F. H. GAERTNER, and T. WHITE

### Session 139 (Q)

## STARVATION, SURVIVAL, AND RECOVERY OF MICROORGANISMS

Thursday, 1:30 P.M., Room 36

Moderators: IAN L. PEPPER, Univ. of Arizona, Tucson, and VICKY L. MCKINLEY, Roosevelt Univ., Chicago, Ill.

1:30

- Q120.** Comparison of Media and Techniques for the Recovery and Enumeration of Aerotolerant Heterotrophic Groundwater Bacteria. A. T. MIKELL, JR.\* and J. C. RICHARDSON, Univ. of Mississippi, University.
- Q121.** Use of a Fluorescent Redox Probe for Direct Enumeration of Actively Respiring Bacteria. G. RODRIGUEZ,\* D. PHIPPS, JR., and H. RIDGWAY, Orange County Water District Biotechnology Res. Dept., Fountain Valley, Calif.
- Q122.** Effects of Phosphorus Limitation and Predation on Biodegradation of Substrates in Mixtures. W. S. STEFFENSEN\* and M. ALEXANDER, Cornell Univ., Ithaca, N.Y.
- Q123.** Optimization of 15 Parameters Influencing Microbial Survival and Recovery in Aquatic Systems. D. C. OBENHUBER\* and E. B. RODGERS, Sverdrup Tech. and NASA, Marshall Space Flight Ctr., Ala.

2:30

- Q124.** Survival of Indicator Organisms in Desert Soil Amended with Sewage Sludge. I. L. PEPPER,\* K. L. JOSEPHSON, and R. L. BAILEY, Dept. of Soil and Water Sci., Univ. of Arizona, Tucson.
- Q125.** Inhibition of Protein Synthesis and Adhesion of a Copiotrophic Bacterium during Nutrient Deprivation. J. S. MAKI,\* E. A. JOYCE, and R. MITCHELL, Harvard Univ., Cambridge, Mass.
- Q126.** Effects of Starvation on Bacteria. G. PRICE-BISHOP\* and P. SCHEUERMAN, Environmental Health, East Tennessee State Univ., Johnson City.
- Q127.** Survival of Groundwater Bacterial Strains under Nutrient Deprivation. R. J. PALMER, JR.,\* G. BRAKER, A. DOMEYER, and P. HIRSCH, Inst. Allg. Mikrobiologie, Univ. Kiel, Kiel, Germany.

3:30

- Q128.** Nutrient Concentration and Sole-Carbon-Source Effects on Viable Counts of Naphthalene Utilizing *Pseudomonas putida* after Long-Term Starvation. D. ZEIDNER,\* D. HAMILTON, and V. MCKINLEY, Roosevelt Univ., Chicago, Ill.
- Q129.** Inability of Polymerase Chain Reaction To Detect Starved Cells of *Vibrio vulnificus*. D. ROBERTS,\* L. BRAUNS, and J. OLIVER, Univ. of North Carolina, Charlotte.
- Q130.** Use of Fourier Transform Infrared Spectroscopy To Study the Physiological Status of *Bacillus* Species. T. R. ANDERSON,\* D. E. NIVENS, and D. WHITE, Ctr. for Environmental Biotechnology, Univ. of Tennessee, Knoxville.

Session 140 (S). Seminar  
(Eligible for continuing education credit)

## DNA VIRUSES AND THE IMMUNE SYSTEM

Thursday, 1:30 P.M., Room 93

Convenors: DENNIS J. O'CALLAGHAN, Louisiana State Univ. Med. Ctr., Shreveport, and MARK F. STINSKI, Univ. of Iowa Sch. of Med., Iowa City

Adenovirus Proteins That Prevent Cytolysis by CTL and Tumor Necrosis Factor and That Down-Regulate the EGF Receptor  
WILLIAM S. M. WOULD, St. Louis Univ. Sch. of Med., St. Louis, Mo.

Relationship between Epstein-Barr Virus Gene Expression and B-Lymphocyte Differentiation  
SAMUEL H. SPECK, Harvard Med. Sch., Boston, Mass.

Role of Poxvirus Host Range, Complementlike Genes, and Serpentine Genes in Pathogenesis  
RICHARD W. MOYER, Univ. of Florida Sch. of Med., Gainesville

Lymphotropic Herpesvirus Vectors in Helper T-Lymphocyte Transformation  
BERNHARD FLECKENSTEIN, Inst. für Klinische und Molekulare Virologie, Univ. Erlangen-Nürnberg, Erlangen, Germany

Session 141 (D). Seminar  
(Eligible for continuing education credit)

## PELVIC INFLAMMATORY DISEASE: IMMUNITY AND PATHOGENESIS

Thursday, 1:30 P.M., Room 1

Convenors: JANEI N. ARNO, Indiana Univ. Sch. of Med., Indianapolis, and GARY L. GORBY, Univ. of Nebraska, Omaha

### Divisional Lecture

Overview and Animal Models of Chlamydial Pelvic Inflammatory Disease  
JULIUS SCHACHTER, Univ. of California, San Francisco

Pathogenesis of Chlamydial Salpingitis  
DOROTHY L. PATTON, Univ. of Washington, Seattle

Role of the T Cell in Response to Chlamydial Genital Infections in the Guinea Pig and Mouse Models  
ROGER G. RANK, Univ. of Arkansas, Little Rock

Role of Lipooligosaccharide in Gonococcal Genital Infection  
MICHAEL A. APICELLA, SUNY at Buffalo, Buffalo, N.Y.

Contact-Inducible Invasion of an Endometrial Cell Line by *Neisseria gonorrhoeae*  
VIRGINIA CLARK, Univ. of Rochester, Rochester, N.Y.

Gonococcal Iron Scavenging: Transferrin Utilization  
CYNTHIA NAU<sup>1</sup> CORNELISSEN, Univ. of North Carolina,  
Chapel Hill

**Session 142 (O). Seminar**  
(Eligible for continuing education credit)

**NOVEL MOLECULAR GENETIC APPROACHES  
FOR THE PRODUCTION OF NEW  
METABOLITES IN STREPTOMYCETES**

(In honor of Robert L. Hamill)

Thursday, 1:30 P.M., Room 80

Convenors: BURTON M. POGELL, Univ. of Maryland, Laurel,  
and PAUL ENGEL, USDA, New Orleans, La

**Divisional Lecture**

Microbial Metabolites: Products, Pitfalls and Profits  
ROBERT L. HAMILL, Lilly Res. Lab., Indianapolis, Ind.

Genetic Engineering in *Saccharopolyspora erythraea* for New  
Macrolide Antibiotics  
J. MARK WEBER, FermaLogic, Inc., Chicago, Ill.

Cloning Nikkomycin Genes Using Transposon Tagging  
PAUL ENGEL, USDA, New Orleans, La.

A Structure-Function-Based Approach towards Engineering  
Novel Aromatic Polyketides  
CHAITAN KHOSLA, John Innes Inst., Norwich, United  
Kingdom

Molecular Genetics of Macrolide Antibiotic Biosynthesis  
BRIGITTE SCHONER, Lilly Res. Lab., Indianapolis, Ind.

**Session 143 (B). Seminar**  
(Eligible for continuing education credit)

**AGAINST THE ODDS: SALMONELLA  
SURVIVAL STRATEGIES**

Thursday, 1:30 P.M., Room 19

Convenors: JOHN W. FOSTER, Univ. of South Alabama Col. of  
Med., Mobile, and BRETT FINLAY, Univ. of British Colum-  
bia Col. of Med., Vancouver, British Columbia, Canada

OxyR-Regulated Defenses against Oxidative Stress  
GISELA STORZ, Nat. Inst. of Child Health and Human  
Development, Bethesda, Md.

Life after the Feast: Starvation Survival and Gene Expression  
MICHAEL P. SPECTOR, Univ. of South Alabama, Mobile

How *Salmonella* Resists Cationic Microbicidal Peptides  
EDUARDO GROISMAN, Washington Univ., St. Louis, Mo.

Proton Wars: *Salmonella*'s Acid Tolerance Response  
JOHN W. FOSTER, Univ. of South Alabama Col. of Med.,  
Mobile

*Salmonella* as a Bioprobe of the Intracellular Parasitic Environ-  
ment

BRETT FINLAY, Univ. of British Columbia Col. of Med.,  
Vancouver, British Columbia, Canada

*Salmonella* Proteins Required for Survival within Macrophages  
NANCY BUCHMEIER, Univ. of California, San Diego

**Session 144 (B)**

**LYME BORRELIOSIS**

Thursday, 1:30 P.M., Room 33

Moderators: ROBERT CLOSS, Middlebury Col., Middlebury,  
Vermont, and ULF B. GOBEL, Inst. Fur Med. Mikrobiologie  
und Hygiene, Freiburg, Germany

1:30

**B184.** Interaction of *Borrelia burgdorferi* with Polarized Mam-  
malian Epithelial Cells. M. KEEN\* and B. JOHNSON, Div.  
of Vector-Borne Infectious Diseases, Nat. Ctr. for Infectious  
Diseases, CDC, Fort Collins, Colo.

**B185.** Immunological Cross-Reactivity of *Borrelia burgdorferi*  
Proteins with Lactoferrin, Transferrin, and *Mycobacterium*  
*bovis*. R. G. CLUSS,\* B. SILVERMAN, A. MAPES, and J. T.  
BOOTHBY, Middlebury Col., Middlebury, Vermont, and San  
Jose State Univ., San Jose, Calif.

**B186.** Selection of *Borrelia burgdorferi* Escape Variants with  
Polyclonal Immune Serum and Monoclonal Antibodies. A.  
SADZIENE\* and A. G. BARBOUR, Univ. of Texas Health  
Sci. Ctr., San Antonio.

**B187.** Differential Susceptibility of Low- and High-Pressure  
Isolates of *Borrelia burgdorferi* to the Bactericidal Activity of  
Specific Antiserum. P. BROWN\* and S. D. THOMPSON,  
Wayne State Univ., Detroit, Mich.

2:30

**B188.** In Vitro Borreliacidal Activity of Sera from Mice Infected  
with *Borrelia burgdorferi*. Y.-S. LU,\* L. C. NIE, J. A.  
RICHARDSON, W. C. LAI, and S. P. PAKES, Univ. of  
Texas Southwestern Med. Ctr., Dallas.

**B189.** Characterization of Monoclonal Antibodies to Outer  
Surface Epitopes of *Borrelia burgdorferi*. L. E. COMSTOCK,  
R. J. SHOBERG,\* and D. D. THOMAS, Univ. of Texas  
Health Sci. Ctr., San Antonio.

**B190.** Genotypic Characterization of Various *Borrelia burgdor-*  
*feri* Isolates by Direct Sequencing of Amplified 16S rRNA  
Genes. U. B. GOBEL,\* T. ADAM, B. GRAF, and M.  
SCHUPPLER, Inst. für Med. Mikrobiologie und Hygiene,  
Univ. Freiburg, Freiburg, Germany.

**B191.** Genetic Variation among *Borrelia burgdorferi* Isolates at  
the *ospA/B* and *fla* Loci. A. R. FICHT,\* T. A. FICHT, J.  
RAWLINGS, M. MEWHINNEY, and K. CLARK, Texas  
A&M Univ./Texas Agricultural Exp. Station, College Station,  
and Texas Dept. of Health, Austin.

3:30

**B192.** Molecular Characterization of *Borrelia burgdorferi* Iso-  
lates from Various Sources. B. C. ZINGG,\* A. BISTRUP, and  
R. B. LEFEBVRE, Univ. of California, Davis.

**B193.** Characterization of a Repetitive DNA Sequence in  
*Borrelia burgdorferi*. W. R. ZUECKERT,\* E. FILIPUZZI-

THURSDAY

JENNY, and J. MEYER. Dent. Inst., Dept. of Oral Microbiol., Basel, Switzerland.

- B194.** Molecular Cloning and Characterization of a 30-kDa Plasmid-Encoded Lipoprotein (Lap30) Expressed by Low-Passage Strains of *Borrelia burgdorferi*. S. J. NORRIS,\* C. J. CARTER, J. A. ARNETT, and A. G. BARBOUR. Univ. of Texas Med. Sch., Houston, and Univ. of Texas Health Sci. Ctr., San Antonio.
- B195.** Maintenance of Virulent *Borrelia burgdorferi* in 4% O<sub>2</sub> In Vitro. F. E. AUSTIN. Univ. of Louisville Sch. of Med., Louisville, Ky.

### Session 145 (U)

#### MYCOBACTERIAL INFECTIONS AND AIDS

Thursday, 1:30 P.M., Room 95

*Moderators:* C. ROBERT HORSBURGH, CDC, Atlanta, Ga., and MICHAEL CYNAMON, VA Med. Ctr., Syracuse, N.Y.

1:30

- U24.** Characterization of a New Drug-Resistant Mycobacterium Species Associated with Pulmonary Disease in AIDS Patients. M. YAKRUS,\* W. BUTLER, J. KILBURN, B. PLIKAYTIS, C. MOSS, V. SILCOX, M. FLOYD, F. VADNEY, and W. GROSS. CDC, Atlanta, Ga., and Dept. of Veterans Affairs, West Haven, Conn.
- U25.** Fastidious Mycobacteria Resembling *Mycobacterium simiae* from AIDS Patients. M. B. COYLE,\* L. C. CARLSON, C. K. WALLIS, R. B. LEONARD, and V. RAISYS. Harborview Med. Ctr. and Univ. of Washington, Seattle.
- U26.** Isolation of Fastidious Mycobacteria from AIDS Patients. K. M. JACKSON,\* A. S. SIEVERS, B. C. ROSS, and B. W. DWYER. Fairfield Hosp., Victoria, Australia.
- U27.** Growth Studies of *Mycobacterium haemophilum* in Radiometric Media. S. H. SIDDIQI\* and C. C. HWANGBO. BDDIS Res. & Development, Sparks, Md.

2:30

- U28.** Dissemination of Enteric *Mycobacterium avium* Infections in Mice Infected with MAIDS Retrovirus. S. K. FURNEY\* and I. M. ORME. Dept. of Microbiol., Colorado State Univ., Fort Collins.
- U29.** Prospective Screening for *Mycobacterium avium* Complex in the Respiratory and Gastrointestinal Tract of Persons with Human Immunodeficiency Virus Infection and < 200 CD4<sup>+</sup> Cells. J. HAVLIK,\* C. HORSBURGH, K. BARRETT, B. METCHOCK, L. DIEM, D. RIMLAND, and S. THOMPSON. Grady Mem. Hosp., Emory Univ. Sch. of Med., CDC, and VA Hosp., Atlanta, Ga.
- U30.** Incidence of Mycobacterial Infections in Human Immunodeficiency Virus-Positive Intravenous Drug Abusers: Analysis of 246 Necropsy Cases. Z. KAMINSKI,\* M. PEARCE, J. LOMBARDO, R. GOODE, A. BLOCH, K. SHILKRET, and M. LYONS. New Jersey Med. Sch.-Univ. of Med. and Dent. of New Jersey, Newark; New Jersey State Health Lab., Trenton; Office of New Jersey State Med. Examiner, Newark; and CDC, Atlanta, Ga.
- U31.** Studies on *Mycobacterium avium* Complex Isolates from AIDS Patients. R. G. DESHPANDE,\* M. B. KHAN, and R. G. NAVALKAR. Morehouse Sch. of Med., Atlanta, Ga.

3:30

- U32.** Comparative Study of *Mycobacterium avium* Complex (MAC) Isolated from Immunocompromised and Immunocompetent Patients and from Environmental Sources. I. Recovery of MAC from Los Angeles Potable Water. S. FROMAN,\* N. GLOVER, A. HOLTZMAN, T. ARONSON, O. G. W. BERLIN, P. DOMINGUEZ, S. ANDERSON, and G. OVERTURE. Olive View Med. Ctr., Sylmar, Calif.; UCLA Med. Ctr., Los Angeles, Calif.; and Univ. of New Mexico Med. Ctr., Albuquerque.
- U33.** Epidemiologic Impact of Tuberculosis Vaccination in Human Immunodeficiency Virus-Prevalent Populations. J. S. SUEN and T. M. DANIEL.\* Case Western Reserve Univ., Cleveland, Ohio.

### Session 146 (P)

#### ADVANCES IN DETECTION OF PATHOGENIC BACTERIA IN FOODS

Thursday, 1:30 P.M., Room 97

*Moderators:* NELSON COX, USDA, Agricultural Res. Service, Russell Res. Ctr., Athens, Ga., and PAUL HALL, Kraft General Foods, Glenview, Ill.

1:30 Divisional Lecture

(Eligible for continuing education credit)

Shedding New Light on Food Microbiology

GORDON S. A. B. STEWART, Sutton Bonington, Loughborough, Leicestershire, U.K.

2:30

- P20.** Molecular Heterogeneity of Hemolysin BL from *Bacillus cereus*. D. J. BEECHER\* and J. D. MACMILLAN. Univ. of Wisconsin, Madison, and Rutgers Univ., New Brunswick, N.J.
- P21.** Development of a Latex Assay To Specifically Detect *Listeria monocytogenes* in Foods. G. MATAR,\* G. AJELLO, M. EGAL, W. BIBB, and B. SWAMINATHAN. CDC, Atlanta, Ga.
- P22.** Specific Monoclonal Antibody-Microcolony Blot Assay To Detect and Enumerate *Listeria monocytogenes* in Foods in 24 h. A. K. BHUNIA\* and M. G. JOHNSON. Dept. of Food Sci. and Arkansas Biotechnology Ctr., Fayetteville.
- P23.** Murine Hybridomas for Rapid In Vitro Pathogenicity Screening Tests of *Listeria monocytogenes* Cultures. P. J. STEELE,\* A. K. BHUNIA, M. H. KOGUT, and M. G. JOHNSON. Dept. of Food Sci., Dept. of Biol. Sci., and Arkansas Biotechnology Ctr., Univ. of Arkansas, Fayetteville.

3:30

- P24.** One-Day Quantitative Cytopathogenicity Test To Assay Food and Environmental Samples for Virulent *Listeria*. Y. W. HO, B. JACKSON, T. J. HANSEN, and J. L. CHEN-WU.\* VICAM, Somerville, Mass.
- P25.** *Campylobacter jejuni* Implicated in a Shellfish-Borne Illness Case: Incidence Study. C. ABEYTA, JR.,\* F. G. DEETER, C. A. KAYSNER, M. M. WEKELL, and R. F. STOTT. Seafood Products Res. Ctr., FDA, Bothell, Wash., and Dept. of Health Shellfish Programs, Olympia, Wash.

**P26.** New Enrichment Medium and Procedure for Rapid Growth of *Campylobacter jejuni*. F. NIROOMAND\* and D. Y. C. FUNG. Dept. of Animal Sci., Kansas State Univ., Manhattan.

**P27.** Derivation of *Salmonella enteritidis* Specific Monoclonal Antibodies and Their Use in a Rapid Assay. A. W.-C. LIN,\* G. H. SNOEYENBOS, and R. A. GOLDSBY. Dept. of Vet and Animal Sci., Univ. of Massachusetts, Amherst.

4:30

**P28.** Comparison of Buffered Peptone and Universal Preenrichment Broths for Recovery of Salmonellae from Broiler Chicken Carcasses. J. S. BAILEY\* and N. A. COX. USDA, Agricultural Res. Service, Russell Res. Ctr., Athens, Ga.

### Session 147 (G). Seminar

(Eligible for continuing education credit)

## IMMUNOPROPHYLAXIS OF MYCOPLASMAL DISEASES

Thursday, 1:30 P.M., Room 82

*Convenors:* WAYNE LAI, Univ. of Texas, Dallas, and LEIGH WASHBURN, Univ. of South Dakota, Vermillion

Status of *Mycoplasma pneumoniae* Vaccination  
P. C. HU, Univ. of North Carolina, Chapel Hill

A Potential Vaccine Antigen Derived from Recombinant DNA Technology: Characterization and Identification by a Protective Monoclonal Antibody  
WAYNE LAI, Univ. of Texas, Dallas

Immunoprophylaxis against Epizootic Pneumonia of Swine  
K. I. DAYALU, SmithKline Beecham, Lincoln, Nebr.

Vaccination of Lewis Rats against Acute *Mycoplasma arthritis*-Induced Arthritis  
LEIGH R. WASHBURN, Univ. of South Dakota, Vermillion

### Session 148 (Q). Seminar

(Eligible for continuing education credit)

## RECENT PROGRESS IN IN SITU BIOREMEDIATION

Thursday, 1:30 P.M., Room 87

*Convenors:* DURELL C. DOBBINS, BioTrol, Inc., Chaska, Minn., and C. MARJORIE AELION, Univ. of South Carolina, Columbia

In Situ Bioremediation: Problems and Progress  
C. MARJORIE AELION and DURELL C. DOBBINS, Univ. of South Carolina, Columbia, and BioTrol, Inc., Chaska, Minn.

Adaptation of Subsurface Microflora to Hydrogen Peroxide  
STEPHANIE FIORENZA and C. HERB WARD, Rice Univ., Houston, Tex.

Comparative Evaluation of Phenol and Methane for In Situ Biotransformation of Chlorinated Solvents

PERRY MCCARTY, LEWIS SEMPRINI, and GARY HOPKINS, Stanford Univ., Stanford, Calif.

In Situ Bioremediation of  $\text{CCl}_4$  and  $\text{NO}_3^-$ -Contaminated Groundwater at the U.S. Department of Energy's Hanford Site

T. BROUNS, J. FREDRICKSON, D. WORKMAN, and R. SKEIN, Pacific Northwest Lab., Richland, Wash.

In Situ Bioremediation Demonstrations at the U.S. Department of Energy's Savannah River Site

TERRY HAZEN, Westinghouse Savannah River Site, Aiken, S.C.

In Situ Bioremediation of a Pentachlorophenol-Contaminated Site Using Nitrate as the Electron Acceptor

CARROL D. LITCHFIELD, K. E. DOROW, and R. KRISHNAMOORTHY, Environmental Technology Applications, Monroeville, Pa.

### Session 149 (M). Seminar

(Eligible for continuing education credit)

## RNA POLYMERASE:PROMOTER INTERACTIONS

Thursday, 1:30 P.M., Room 38

*Convenors:* WILLIAM T. MCALLISTER, SUNY at Brooklyn, Brooklyn, N.Y., and ALEX GOLDFARB, Columbia Univ., New York, N.Y.

Study of Transcription Initiation Using RNA Polymerase Mutants  
ALEX GOLDFARB, Columbia Univ., New York, N.Y.

Sigma:DNA Interactions  
ALICIA DOMBROSKI, Univ. of Wisconsin, Madison

Roles of Sigma Factors in Multiple Steps of Promoter Utilization  
CHARLES MORAN, Emory Univ. Sch. of Med., Atlanta, Ga.

Virion RNA Polymerase:Promoter Interactions  
LUCIA ROTHMAN-DENES, Univ. of Chicago, Chicago, Ill.

Interactions of T7 RNA Polymerase with Its Promoters  
WILLIAM T. MCALLISTER, SUNY at Brooklyn, Brooklyn, N.Y.

## POSTER SESSIONS

Thursday, 1:30-3:00 P.M., Exhibit Hall C

(Board numbers in parentheses)

### Session 150 (C). VIRAL DETECTION I

**C140.** Evaluation of Rapid Detection Methods for Respiratory Viruses in Nasopharyngeal Specimens from Pediatric Patients. (001) P. YAM\* and R. KRUGER, Children's Mem. Hosp., Omaha, Nebr.

**C141.** Detection of Retinitis Induced by Herpes Simplex Virus, Human Cytomegalovirus, or Varicella-Zoster Virus Using Polymerase Chain Reaction. (003) T. FENNER,\* J. GARWEG, A. KROPEC, M. BOEHNKE, and H. SCHMITZ.



- Bernhard-Nocht-Inst. for Tropical Diseases, Hamburg, Germany; Univ. Clin. of Ophthalmology, Bern, Switzerland; and Univ. Hosp., Freiburg, Germany.
- C142.** Adventitious Viral Contaminant in Commercially Supplied A549 Cells: Identification of Infectious Bovine Rhinotracheitis Virus and Its Impact on Laboratory Diagnosis of Clinical Specimens. (005) K. Y. FONG\* and M. L. LANDRY. VA Med. Ctr., West Haven, Conn., and Yale Univ. Sch. of Med., New Haven, Conn.
- C143.** Comparison of Detection Methods for Adenovirus-Associated Pediatric Gastroenteritis. (007) G. AHLUWALIA,\* G. HAMMOND, T. SCOTT-TAYLOR, and B. KLISKO. Cadham Provincial Lab., Winnipeg, Manitoba, Canada.
- C144.** Comparison of A549 and HEK Cells for Primary Isolation of Adenovirus. (009) J. R. PROTIC,\* K. C. LEIBENGUTH, and L. A. WEYMOUTH. Univ. of Rochester Med. Ctr., Rochester, N.Y.
- C145.** Comparison of MRC-5 and Mink Lung Cells for Rapid Cytomegalovirus Culture. (011) C. BELASKI,\* E. MARTIN, M. MORRIS, and B. BRUMBACK. American Med. Lab., Inc., Fairfax, Va.
- C146.** Detection of Cytomegalovirus DNA from Multiple Clinical Sites by Using the Polymerase Chain Reaction and Correlation with Culture. (013) M. J. MILLER,\* K. PADO, and E. WAGAR. UCLA Med. Ctr., Los Angeles, Calif.
- C147.** Optimization for Detection of Cytomegalovirus by the Polymerase Chain Reaction in Clinical Laboratory Samples. (015) M. ROCKIS,\* S. ROSEFF, J. KEISER, M. CAPARAS, J. COMERFORD, and C. T. GARRETT. George Washington Univ. Med. Ctr., Washington, D.C.
- C148.** Serum Thymidine Kinase in Allogeneic Marrow Transplant Patient and Correlation with Cytomegalovirus Viremia. (017) J. TARRAND,\* J. YAU, C. LEMAISTER, R. WALLERSTEIN, B. ANDERSON, and H. FRITSCHKE, JR. Univ. of Texas M. D. Anderson Cancer Ctr., Houston.
- C149.** Results of Culturing Cell and Cell-Free Fractions of Bronchoalveolar Lavage Fluid for Cytomegalovirus in Lung Transplant Recipients. (019) M. GAUDREULT-KEENER,\* N. ETTINGER, and G. STORCH. Washington Univ. Sch. of Med., St. Louis, Mo.
- C150.** Rapid Detection of Cytomegalovirus Viremia by Shell Vial and Indirect Immunoperoxidase Methodologies. (021) S. M. LIPSON,\* M. H. KAPLAN, J. K. SIMON, Z. CIAMICIAN, and L.-F. TSENG. North Shore Univ. Hosp.-Cornell Univ. Med. Col., Manhasset, N.Y.
- C151.** Evaluation of CMV-vue for Rapid Cytomegalovirus Antigen Detection in Peripheral Blood Leukocytes. (023) S. BRAKE,\* M. ROMAGNOLI, and M. FORMAN. Johns Hopkins Med. Inst., Baltimore, Md.
- C152.** Comparison of Quantitative Shell Vial Culture, Conventional Tube Culture, and Immunoperoxidase Staining of Leukocytes for Detection of Cytomegalovirus Viremia. (025) P. WELBY,\* M. GAUDREULT-KEENER, R. BULLER, T. BAILEY, T. LANGLOIS, and G. STORCH. Washington Univ. Sch. of Med., St. Louis, Mo.
- C153.** Diagnosis of Cytomegalovirus Viremia—a Comparison of Three Methods: Direct Immunostaining of Peripheral Leukocytes; Spin-Amplified Tube Cultures; and Shell Vial Cultures. (027) P. E. OEFINGER,\* E. B. GOLUNSKI, P. C. JOHNSON, and R. P. HILLAM. Univ. of Texas Med. Sch., Houston, and INCSTAR Corp., Stillwater, Minn.
- C154.** Decreased Incubation for Isolation of Human Cytomegalovirus using Anti-Interferon. (029) N. SWACK,\* S. JIRSA, and J. RODRIQUEZ. Hygienic Lab. and Dept. of Microbiol., Univ. of Iowa, Iowa City.
- C155.** Effect of Preinoculation Sonication of Clinical Specimens on Detection of Cytomegalovirus Using Shell Vial Cultures. (031) S. SELEPAK, J. CALLAWAY, and H. D. ENGLER\* NIH, Bethesda, Md.
- C156.** Detection of a 1991 Outbreak of Echovirus 30 in Canada Using a Novel Agar Diffusion Overlay Method for Typing Enterovirus. (033) S. LEE, J. CAMPBELL, M. DREBOT,\* J. BOUTILIER, M. MACDONALD, and K. FORWARD. Nat. Ctr. for Enteroviruses, VGH, Halifax, Nova Scotia, Canada.
- C157.** Enterovirus Isolation: Shell Vial Centrifugation versus Tube Culture. (035) V. C. SALMON, E. W. TAGGART, and J. C. OVERALL, JR.\* Associated Regional and University Pathologists, Dept. of Pathology and Pediatrics, Univ. of Utah Sch. of Med., Salt Lake City.
- C158.** Polymerase Chain Reaction Technology Enables Rapid and Reliable Diagnosis of Enterovirus in Children with Suspected Aseptic Meningitis. (037) C. MCDOWELL,\* J. DOWNEY, M. FEARON, M. PETRIC, and L. PENN. Hosp. for Sick Children, Toronto, Ontario, Canada.
- C159.** Evaluation of A549 Cells in Centrifugation Culture for the Rapid Detection of Varicella-Zoster Virus. (039) B. HILL and H. VISCOUNT.\* Brooke Army Med. Ctr., Fort Sam Houston, Tex.

### Session 151 (U). MYCOBACTERIA: CULTIVATION, IDENTIFICATION, AND PATHOGENIC MECHANISMS

- U34.** Comparison of Septi-Chek AFB versus BACTEC and Lowenstein-Jensen Agar for Detection and Isolation of Mycobacteria. (041) P. S. WHITTIER,\* K. WESTFALL, S. SETTERQUIST, and R. L. HOPFER. Univ. of North Carolina Hosp., Chapel Hill.
- U35.** Rapid Nonradiometric Identification of *Mycobacterium tuberculosis* and *Mycobacterium avium-intracellulare* Using AccuProbe and Septi-check AFB Systems. (043) M. DRUMMER\* and K. SZABO. Nassau County Med. Ctr., East Meadow, N.Y., and Sch. of Med., SUNY at Stony Brook, Stony Brook, N.Y.
- U36.** Comparative Study on the Recovery of Mycobacteria in Roche Septi-Chek AFB and on Conventional Media. (045) M. T. SHIOZAKI, E. G. FORD, E. P. DESMOND,\* and M. VALESCO. Microbial Diseases Lab., California Dept. of Health Services, Berkeley, and Alameda County Publ. Health Lab., Oakland, Calif.
- U37.** Detection of Acid-Fast Bacteria from Blood Cultures. (047) K. EVANS,\* D. FORTHAL, and E. PETERSON. Univ. of California-Irvine Med. Ctr., Orange.
- U38.** Rapid Assessment of Mycobacterial Growth inside Macrophages and in Mice Using a Radiometric (BACTEC) Method. (049) S. SRINIVASAN,\* M. V. REDDY, B. ANDERSEN, and P. R. J. GANGADHARAM. Univ. of Illinois, Chicago.
- U39.** Improving the Use of BACTEC Radiometry for Testing the Effect of Disinfectants on *Mycobacterium tuberculosis*. (051) R. R. CUTLER,\* P. WILSON, and F. V. CLARKE. Newham District Microbiol. Lab., St. Andrews Hosp., London, England.
- U40.** Recovery and Detection of Mycobacteria with the BacT/Alert System. (053) S. B. WILKINS\* and T. C. THORPE. Organon Teknika Corp. Durham, N.C.
- U41.** Comparison of Decontamination Methods for Recovery of *Mycobacterium avium* Complex from Stools. (055) D. M. YAJKO,\* P. S. NASSOS, C. A. SANDERS, P. C. GONZALEZ, A. L. REINGOLD, C. R. HORSBURGH, D. P. CHIN, P. C. HOPEWELL, and W. K. HADLEY. Univ. of California, San Francisco Gen. Hosp., San Francisco; Univ. of California, Berkeley; and CDC, Atlanta, Ga.

- U42.** Reproducibility of the Lysis-Centrifugation Technique for Quantification of *Mycobacterium avium* Complex Bacteremia. (057) D. HAVLIR, C. A. KEMPER,\* S. DERESINSKI, and THE CALIFORNIA COLLABORATIVE TREATMENT GROUP. Univ. of California, San Diego, and Santa Clara Valley Med. Ctr., San Jose, Calif.
- U43.** Effect of Palmitate on the In Vitro Growth of *Mycobacterium leprae*. (059) M. ISHAQUE. Inst. Armand-Frappier, Applied Microbiol. Res. Ctr., Univ. of Quebec, Laval, Quebec, Canada.
- U44.** Effect of pH on Recovery of *Mycobacterium avium* Complex from Fecal Specimens by Using an Oxalic Acid Decontamination Procedure. (061) P. S. NASSOS,\* D. M. YAJKO, C. A. SANDERS, P. C. GONZALEZ, and W. K. HADLEY. Univ. of California, San Francisco Gen. Hosp., San Francisco.
- U45.** Transposition and Colonial Variation in *Mycobacterium intracellulare*. (063) L. E. VIA\* and J. O. FALKINHAM III. Virginia Polytechnic Inst. and State Univ., Blacksburg.
- U46.** Enhancement of Acid-Fastness in Certain *Mycobacterium* and *Nocardia* Species by Lipid Supplementation. (065) L. SWEENEY,\* S. ZIMMERMAN, and C. NEEDHAM. Lahey Clin. Med. Ctr., Burlington, Mass.
- U47.** Lipopeptides of Potential Importance in *Mycobacterium avium* Glycopeptidolipid Biosynthesis. (067) E. L. WRIGHT\* and W. W. BARROW. Texas Col. of Osteopathic Med., Fort Worth.
- U48.** Identification of Glutaraldehyde-Resistant, Rapidly Growing Mycobacteria Based on Sole-Carbon-Source Utilization. (069) C. ROBERTS,\* S. GUIDA, and H. CHANMYERS. Baxter Healthcare Corp., Edwards CVS Div., Irvine, Calif.
- U49.** Effect of Aggregation or Pelleting on the Metabolic Activity of *Mycobacterium leprae* In Vitro. (071) E. HARRIS\* and R. HASTINGS. G. W. Long Hansen's Disease Ctr., Carville, La.
- U50.** Use of Low Temperature for Efficient Uptake of DNA by *Mycobacterium smegmatis* Spheroplasts. (073) S. A. NASER\* and C. M. MCCARTHY. New Mexico State Univ., Las Cruces.
- U51.** Laboratory Characterization of *Mycobacterium xenopi*. (075) C. F. MARX,\* J. D. MATTHEWS, M. L. WILSON, and A. MORRIS. Duke Univ. Med. Ctr., Durham, N.C.
- U52.** Continuous Growth of *Mycobacterium lepraemurium* in Animal Cell Cultures. (077) D. AJDUKOVIC,\* I. AJDUKOVIC, and M. ISHAQUE. Inst. Armand-Frappier, Laval, Quebec, Canada.
- U53.** Immunological and Ultrastructural Modifications of Murine Cells Exposed to *Mycobacterium avium* Lipids. (079) M. POURSHAFIE,\* Q. AYUB, and W. W. BARROW. Wadley Inst. of Molecular Med., Dallas, Tex., and Texas Col. of Osteopathic Med., Fort Worth.
- U54.** Molecular and Biochemical Analysis of a Cloned *Mycobacterium tuberculosis* Gene Involved in Niacin Production. (081) G. BOMFIM,\* W. D. JOHNSON, JR., and L. W. RILEY. Cornell Univ. Med. Col., New York, N.Y.
- U55.** Induction of Stress Proteins of *Mycobacterium tuberculosis* within Macrophages. (083) M. ALAVI\* and L. F. AFFRONTI. Dept. of Microbiol. and Immunology, George Washington Univ. Med. Ctr., Washington, D.C.
- U56.** Nonopsonic Interactions of *Mycobacterium tuberculosis* with Murine Macrophages of Diverse Phenotypes. (085) R. W. STOKES\* and D. P. SPEERT. Univ. of British Columbia, British Columbia, Canada.

## Session 152 (B). PROTOZOAN PATHOGENS

- B196.** The Enigma of *Trichomonas vaginalis* Contact-Dependent Cytotoxicity. (087) F. F. PINDAK,\* M. MORA DE PINDAK, and W. A. GARDNER, JR. Univ. of South Alabama, Mobile.
- B197.** Effects of Heat Shock on *Trichomonas vaginalis*. (089) L. C. GREEN,\* H. A. SPENCE, and R. B. LUFTIG. Louisiana State Univ. Med. Ctr., New Orleans.
- B198.** Iron Regulates Resistance to Complement in *Trichomonas vaginalis*. (091) M. W. LEHKER\* and J. F. ALDERETE. Univ. of Texas Health Sci. Ctr., San Antonio.
- B199.** Viruslike Particles of *Trichomonas vaginalis* May Regulate Expression of P270 Surface Immunogen. (093) M. A. KHOSHANAN\* and J. F. ALDERETE. Dept. of Microbiol., Univ. of Texas Health Sci. Ctr., San Antonio.
- B200.** Host Cytoadherence by *Trichomonas vaginalis* Is by Random Interdigitating Contact Points. (095) R. ARROYO,\* A. GONZALEZ-ROBLES, A. MARTINEZ-PALOMO, and J. F. ALDERETE. Univ. of Texas Health Sci. Ctr., San Antonio, and Ctr. de Investigacion y de Estudios Avanzados del IPN, Mexico D.F., Mexico.
- B201.** *Trichomonas vaginalis* Proteases Impair Human Fetal Membrane Strength. (097) D. DRAPER,\* R. RICHTER, E. PATTERSON, P. HEINE, J. FRENCH, W. JONES, and J. MCGREGOR. Dept. of Obstetrics-Gynecology, Univ. of Colorado Health Sci. Ctr., and Children's Hosp., Denver.
- B202.** Host Cell Attachment and Lectin Activity in Three Clones of *Tritrichomonas mobilensis*. (099) D. J. WELLS,\* R. W. HAMPTON, D. O. CULBERSON, and W. A. GARDNER, JR. Univ. of South Alabama, Mobile.
- B203.** Further Characterization of *Tritrichomonas mobilensis* Lectin. (101) P. BABAL,\* D. J. WELLS, F. F. PINDAK, and W. A. GARDNER. Univ. of South Alabama Col. of Med., Mobile.
- B204.** Characterization of Sulfhydryl-Dependent Hydrolase Released by *Tritrichomonas mobilensis*. (103) R. W. HAMPTON,\* D. J. WELLS, P. DEMES, and W. A. GARDNER, JR. Univ. of South Alabama, Mobile.
- B205.** *Acanthamoeba* Keratitis: Synergy between Ameba and Bacterial Contaminants in Lens Care Systems as a Prelude to Infection. (105) E. J. BOTTONE, R. M. MADAYAG,\* and M. N. QURESHI. Mount Sinai Hosp., New York, N.Y.
- B206.** Inhibition of *Acanthamoeba* by *Pseudomonas aeruginosa*: a Rationale for Their Mutual Exclusion in Corneal Ulcers and Contact Lens Care Systems. (107) M. N. QURESHI, A. A. PEREZ II,\* and E. J. BOTTONE. Mount Sinai Hosp., New York, N.Y.
- B207.** Bacterial Endosymbionts in *Acanthamoeba* Isolates from the Human Eye. (109) R. GAUTOM,\* S. SEYEDIRASHTI, D. BERGERON, and T. FRITSCH. Univ. of Washington, Seattle.
- B208.** Potential Role of Glycolipids of Rabbit Corneal Epithelium in the Pathogenesis of *Acanthamoeba* Keratitis. (111) T. S. ZAIDI,\* J. BAUM, and N. PANJWANI. Tufts Univ. Sch. of Med., Boston, Mass.
- B209.** First Case of Keratitis in Mexico. (113) R. NARANJO, V. VANZZINI, A. PEREZ, M. OMANA, S. KILVINGTON, F. RIVERA, P. BONILLA,\* G. VISVESVARA, E. GALIFGOS, and A. CALDERON. Asoc. para Evitar la Ceguera en México and Proyecto de Conservación y Mejoramiento del Ambiente, ENEP-Iztacala, Mexico; Publ. Health Lab., Bath, England; and Div. of Parasitic Diseases, U.S.
- B210.** *Leishmania enrietti*: Colony Expression on Agar and Enumeration by Turbidimetric Assay. (115) R. I. KRASNER\* and D. R. BESSETTE. Dept. of Biol., Providence Col., Providence, R.I.

- B211.** Monoclonal Antibodies Specific for Merozoite Surface Protein 1 in *Plasmodium falciparum* Recognize Epidermal Growth Factor-Like Motifs. (117) J. A. CHAPPEL\* and A. A. HOLDER. Nat. Inst. for Med. Res., Mill Hill, London, U.K.
- B212.** Oxygen Affinities of Clinical Isolates of *Giardia lamblia*. (119) J. E. ELLIS,\* J. M. WINGFIELD, D. COLE, R. CAMPBELL, P. F. L. BOREHAM, and D. LLOYD. Univ. of Wales, Col. of Cardiff, Cardiff, Wales, and Queensland Inst. of Med. Res., Brisbane, Queensland, Australia.
- B213.** Ultrastructural Study of a Hartmannellid Amoeba Responsible for Meningoencephalitis and Respiratory Disease in a Young Male Patient. (121) M. CENTENO, F. RIVERA,\* L. CERVA, V. TSUTSUMI, E. GALLEGOS, A. CALDERON, and R. CARDENAS. Hosp. Univ. Puebla, ENEPI UNAM, and CINVESTAV IPN, Mexico, and Med. and Pharmaceutical Inst., Praha, Czechoslovakia.
- B214.** Role of Mononuclear Hydrolases in Inflammatory Responses to *Toxoplasma gondii* Infection. (123) R. TACKLEY\* and O. KASSIM. Howard Univ. Col. of Med., Washington, D.C.
- B215.** Immunodeficient Mouse Model of Cryptosporidiosis. (125) G. J. LEITCH,\* F. H. BRANDT, and P. J. LAMMIE. Morehouse Sch. of Med. and CDC, Atlanta, Ga.

### Session 153 (O). APPLIED MICROBIOLOGY

- O33.** Mycoparasitism of *Aspergillus flavus* by *Paecilomyces lilacinus*. (127) S. C. GUPTA,\* T. D. LEATHERS, and D. T. WICKLOW. Nat. Ctr. for Agricultural Utilization Res., USDA, Agricultural Res. Service, Peoria, Ill.
- O34.** Dynamics of Soil Populations of *Aspergillus flavus* in Furrow-Irrigated Cotton Fields in the Desert Southwest. (129) R. K. SOUFI,\* P. J. COTTY, and M. R. NELSON. Univ. of Arizona, Yuma Valley Agricultural Ctr., Yuma; USDA, Agricultural Res. Service, Southern Regional Res. Ctr., New Orleans, La.; and Univ. of Arizona, Tucson.
- O35.** Utility of a Monoclonal Antibody to  $\beta$ -Galactosidase in the Detection of  $\alpha$ -Peptide and  $\alpha$ -Peptide Fusions. (131) M. BEAUREGARD, M. A. HEFFORD, and R. M. TEATHER.\* Ctr. for Food and Animal Res., Agriculture Canada, Ottawa, Ontario, Canada.
- O36.** Use of a Nonisotopic Gene Probe and 4-Methylumbelliferyl Glucuronide Methods for Detection of *Escherichia coli* in Water. (133) A. E. MCDANIELS, E. W. RICE,\* A. L. REYES, and G. N. STELMA, JR. U.S. EPA, Cincinnati, Ohio.
- O37.** Accelerated Fermentation of Antifungal Metabolites by *Streptomyces rimosus*. (135) S. C. CROAN\* and T. L. HIGHLEY. USDA, Forest Service, Forest Products Lab., Madison, Wis.
- O38.** The Role of Sugars in Molluscicidal Activity of *Bacillus brevis* SS86-4. (137) S. SINGER,\* T. B. BAIR, and T. B. HAMMILL. Western Illinois Univ., Macomb.
- O39.** Acetate and Calcium Magnesium Acetate Production by a Mutant Strain of *Clostridium thermoaceticum* ATCC 49707. (139) M. CHERYAN and S. PAREKH.\* Dept. of Food Sci., Agricultural Bioprocess Lab., Univ. of Illinois, Urbana.
- O40.** Production of a Siderophore from *Corynebacterium glutamicum* ATCC 13058 and Growth Parameters under Iron-Limited Conditions. (141) A. SEIFFERT\* and H. ZAHNER. Dept. of Microbiol. I, Univ. of Tübingen, Tübingen, Germany.
- O41.** Relationship of Acetyl Composition to Rheological Functions in *Arthrobacter* Heteropolysaccharides. (143) J. S. NOVAK,\* S. W. TANENBAUM, and J. P. NAKAS. SUNY Col. of Environmental Sci. and Forestry, Syracuse, N.Y.

- O42.** Extracellular Acidic Heteropolysaccharide Production from Wood Hydrolysates. (145) M. J. MEADE,\* S. W. TANENBAUM, and J. P. NAKAS. SUNY Col. of Environmental Sci. and Forestry, Syracuse, N.Y.
- O43.** Presence of Alginate Genes in Bacteria Isolated from Corrosion Tubercles and the Surface of Corroded Metals. (147) J. F. RICE,\* W. H. WALLACE, and D. C. WHITE. Ctr. for Environmental Biotechnology, Univ. of Tennessee, Knoxville.
- O44.** Development of a Novel Sensor for Bioreactor Operation. (149) B. HUANG,\* T. W. WANG, R. BURLAGE, and G. SAYLER. Univ. of Tennessee, Knoxville.
- O45.** Bacterial Polyglutamic Acid as an Aid in Ceramic Processing. (151) T. REN,\* J. T. STALEY, N. B. PELLERIN, and I. AKSAY. Dept. of Microbiol. and Dept. of Material Sci., Univ. of Washington, Seattle.
- O46.** A Positive Effect of *par* Sequence on the Growth Rate of Recombinant *Escherichia coli*. (153) J.-Y. KIM\* and D. Y. RYU. Microbiol. Graduate Group and Dept. of Chemical Engineering, Univ. of California, Davis.
- O47.** Removal of Mycoplasmas from Biological Fluids by Filtration using Mycotrap, a Receptor Analog Solid-Phase Support. (155) L. A. PLOSILA\* and H. C. KRIVAN. MicroCarb Inc., Gaithersburg, Md.
- O48.** Research Support in Applied Microbiology and Biotechnology in Chile and Their Relationship to the Productive Sector. (157) L. A. SALICRUP,\* L. GIL, and M. RODRIGUEZ LEIVA. Rutgers Univ., New Brunswick, N.J., and Univ. de Chile, Santiago, Chile.

### Session 154 (Q). NITRATE REMOVAL AND BIODEGRADATION OF NITROAROMATICS AND AZO-DYES

- Q131.** Inhibition of Preexisting Denitrification Enzyme Activity by Chloramphenicol. (159) M. H. BROOKS\* and R. L. SMITH. U.S. Geological Survey, Boulder, Colo.
- Q132.** Denitrification in Shallow-Placed Low-Pressure Distribution Systems. (161) M. M. IJZERMAN, C. HAGEDORN,\* and R. B. RENEAU, JR. Virginia Polytechnic Inst. and State Univ., Blacksburg.
- Q133.** Autotrophic Hydrogen Oxidation by Denitrification as a Potential Mechanism for Bioremediation of Nitrate-Contaminated Groundwater. (163) R. L. SMITH\* and M. L. CEAZAN. U.S. Geological Survey, Boulder, Colo.
- Q134.** Denitrification of Nitrate Wastes by Alkalophilic Halophiles. (165) A. TIEN\* and G. ANDREWS. Idaho Nat. Engineering Lab., Idaho Falls.
- Q135.** Initial Steps in the Bacterial Degradation of 1,3-Dinitrobenzene. (167) S. F. NISHINO\* and J. C. SPAIN. Air Force Civil Engineering Support Agency, Tyndall Air Force Base, Fla.
- Q136.** Bacterial Degradation of 2,4-Dinitrotoluene. (169) B. E. HAIGLER,\* S. F. NISHINO, J. C. SPAIN, and R. J. SPANGGORD. Air Force Civil Engineering Support Agency, Tyndall Air Force Base, Fla., and SRI Internat., Menlo Park, Calif.
- Q137.** Biotransformation of Nitrosubstituted Aromatic Compounds by Polychlorinated Biphenyl-Degrading Bacteria. (171) A. A. KHAN\* and S. K. WALIA. Oakland Univ., Rochester, Mich.
- Q138.** Intermediary Metabolism during Anaerobic Degradation of Trinitrotoluene (TNT) from Munitions-Contaminated Soil. (173) D. J. ROBERTS,\* S. B. FUNK, and R. A. KORUS. Univ. of Idaho, Moscow.
- Q139.** Bioremediation of 2,4,6-Trinitrotoluene (TNT) by a Mixed Microbial Ecosystem. (175) M. MONDECAR,\* J.

## Session 155 (Q). ENVIRONMENTAL VIROLOGY AND AEROBIOLOGY

- BENDER, J. ROSS, W. GEORGE, and K. DUMMONS. Xavier Univ. of Louisiana, New Orleans; Clark Atlanta Univ., Atlanta, Ga.; and Tulane Med. Sch., New Orleans, La.
- Q140.** Biodegradation of Trinitrotoluene (TNT) by Fungi in Liquid Culture. (177) P. BAYMAN,\* W. L. ALWORTH, and J. W. BENNETT. Tulane Univ., New Orleans, La.
- Q141.** Trinitrotoluene (TNT) Degradation by Fungi Isolated from Explosives-Contaminated Soil. (179) J. E. CRUZ\* and P. BAYMAN. Tulane Univ., New Orleans, La.
- Q142.** Physical Parameters Affecting the Anaerobic Degradation of 2,4,6-Trinitrotoluene (TNT) in Munitions-Contaminated Soil. (181) S. B. FUNK,\* D. J. ROBERTS, and R. A. KORUS. Univ. of Idaho, Moscow.
- Q143.** Biotransformation of 2,4,6-Trinitrotoluene by a Sulfate-Reducing Bacterium (B Strain) Isolated from an Anaerobic Reactor Treating Furfural. (183) R. BOOPATHY,\* M. WILSON, and C. F. KULPA. Dept. of Biol. Sci., Univ. of Notre Dame, Notre Dame, Ind.
- Q144.** Metabolism of 7-Nitrobenz[a]anthracene by the Anaerobic Intestinal Populations of Different Animal Species. (185) M. C. MOREHEAD,\* W. FRANKLIN, and P. P. FU. Nat. Ctr. for Toxicological Res., Jefferson, Ark.
- Q145.** Optimization of an Anaerobic Biological Treatment Process for Soils Contaminated with 2-sec-Butyl-4,6-dinitrophenol (Dinoseb). (187) R. H. KAAKE,\* D. J. ROBERTS, and R. L. CRAWFORD. Univ. of Idaho, Moscow.
- Q146.** Effects of Alternate Substrates on the Degradation of Toxic Chemicals in Industrial Wastewater Stream by Inoculated Bacteria. (189) B. ZAIDI\* and N. MEHTA. Univ. of Puerto Rico, Mayaguez, Puerto Rico.
- Q147.** Induction of *p*-Nitrophenol (PNP) Degradation in Actinomycetes by Structural Analogs of PNP. (191) L. F. HANNE,\* L. L. KIRK, S. M. APPEL, and A. D. NARAYAN. California State Univ., Chico.
- Q148.** Reductive Mechanism in the Aerobic Bacterial Degradation of Picric Acid. (193) H. LENKE,\* P.-G. RIEGER, and H.-J. KNACKMÜSS. Fraunhofer Inst. für Grenzflächen- und Bioverfahrenstechnik and Inst. für Mikrobiologie der Univ. Stuttgart, Stuttgart, Germany.
- Q149.** Degradation of 2,4-Dinitrophenol by a Gram-Positive Bacterium. (195) Y. SUWA,\* M. DIAZ, M. FUKUI, and Y. URUSHIGAWA. Nat. Inst. for Resources and Environment, Tsukuba, Japan, and Neuvo Leon Univ., Mexico.
- Q150.** Structure-Activity Studies with the Aryl Acylamidase from Acetanilide-Degrading Bacteria. (197) D. T. VILLARREAL,\* R. F. TURCO, and A. E. KONOPKA. Purdue Univ., West Lafayette, Ind.
- Q151.** 16S rDNA Probes of Bacterial Isolate C7, an Aerobic Degradator of Azo Dyes. (199) M. GOVINDASHWAMI\* and J. C. LOPER. Dept. of Molecular Genetics, Univ. of Cincinnati Col. of Med., Cincinnati, Ohio.
- Q152.** Degradation of Azo Dye by White Rot Fungi. (201) W.-L. CHAO\* and S.-L. LEE. Dept. of Microbiol., Soochow Univ., Taipei, Taiwan, Republic of China.
- Q153.** Transformation of Azo Dyes by Actinomycetes: Involvement of Oxidative Enzymes. (203) M. B. PASTI,\* S. GOSZCZYNSKI, W. CAO, and Z. WANG. Dept. of Bacteriol. and Biochemistry, Univ. of Idaho, Moscow.
- Q154.** Characterization and Survey of the Ability to Decolorize 22 Azo Dyes by Bacterial Isolates from Several Bioreactors. (205) E. L. HOLDER\* and P. L. BISHOP. Univ. of Cincinnati, Cincinnati, Ohio.
- Q155.** Evaluation of Nonradioactive DNA Probe Systems To Detect Poliovirus in Water Samples from New Hampshire. (207) N. J. MOORE,\* T. S. TALBOT, and A. B. MARGOLIN. Univ. of New Hampshire, Durham.
- Q156.** Evaluation of a <sup>32</sup>P-Labeled RNA Probe for the Detection of Enteroviruses in Ogunquit, Maine, Municipal Sludge. (209) A. E. SUFAT\* and A. B. MARGOLIN. Univ. of New Hampshire, Durham.
- Q157.** Establishment and Maintenance of Lysogeny under Conditions Simulating a Freshwater Environment. (211) T. A. KOKJOHN and R. V. MILLER.\* Argonne Nat. Lab., Argonne, Ill., and Oklahoma State Univ., Stillwater.
- Q158.** Inactivation and Utilization of Coliphages T1 and P1 and Reovirus Type 3 as Carbon, Nitrogen, and Energy Sources by Bacteria. (213) L. A. FINDLAY\* and G. STOTZKY. Biol. Dept., NYU, New York, N.Y.
- Q159.** Characterization of a Bacteriophage from Bioreactors Treating Contaminated Soil. (215) T. A. KOKJOHN,\* C. D. MONTEMAGNO, and J. F. MANNING, JR. Argonne Nat. Lab., Argonne, Ill.
- Q160.** Viruses in Marine Environments: Seasonal Abundance and Contribution to Dissolved DNA. (217) S. C. JIANG\* and J. H. PAUL. Univ. of South Florida, St. Petersburg.
- Q161.** Does Human Immunodeficiency Virus Type 1 (HIV-1) Persist in Wastewater? Detection of HIV-1 Specific Nucleic Acid, Using Polymerase Chain Reaction. (219) S. A. ANSARI,\* S. R. FARRAH, and G. R. CHAUDHRY. Oakland Univ., Rochester, Mich., and Univ. of Florida, Gainesville.
- Q162.** Assessment of In Vitro Biototoxicity of Indoor Air Pollutants. (221) G. PAQUETTE\* and S. LAROCHE. Inst. Armand-Frappier, Univ. du Québec, Laval, Quebec, Canada.
- Q163.** Seasonal Variation of Free-living Amoebae Isolated from the Atmosphere of San Luis Potosi, S.L.P., Mexico. (223) S. RODRIGUEZ-ZARAGOZA,\* P. BONILLA, E. RAMIREZ, and R. ORTIZ. Proyecto de Conservación y Mejoramiento del Ambiente, UIICSE, ENEP-Iztacala, UNAM, Mexico.
- Q164.** A One-Year Survey of Airborne Fungi in Residential Environments. (225) J. R. MELDRUM,\* M. P. BUTTNER, L. E. M. PIFER, and L. D. STETZENBACH. Harry Reid Ctr. for Environmental Studies, Univ. of Nevada, Las Vegas.
- Q165.** Effectiveness of Aerobiological Sampling for the Detection of Indoor Fungal Contamination. (227) M. P. BUTTNER,\* J. R. MELDRUM, L. E. M. PIFER, and L. D. STETZENBACH. Harry Reid Ctr. for Environmental Studies, Univ. of Nevada, Las Vegas.
- Q166.** Environmental Mycological Sampling as an Aid to Diagnosis of Extrinsic Allergic Alveolitis. (229) M. J. MARKOVIC\* and G. R. SELICK. St. Vincent Hosp., Cleveland, Ohio.
- Q167.** Gas Chromatography for Identification of Airborne Bacteria. (231) L. E. M. PIFER,\* J. R. MELDRUM, G. CAIXIA, S. C. HERN, and L. D. STETZENBACH. Harry Reid Ctr. for Environmental Studies, Univ. of Nevada, and U.S. EPA, Las Vegas.
- Q168.** Assessment of Aerosol Fallout during Working Procedures in Dental Operatories. (233) J. W. BEIERLE. USC, Los Angeles, Calif.

## Session 156 (H). GENE REGULATION IN ANAEROBIOSIS AND IN PHOTOSYNTHESIS

- H145.** Autoregulation of the *arcA* Gene of *Escherichia coli*. (235) S. J. PARK,\* P. A. COTTER, and R. P. GUNSALUS. UCLA, Los Angeles, Calif.
- H146.** Role of Heme in Regulation of Respiratory Pathway Operons in *Escherichia coli*. (237) P. A. COTTER\* and R. P. GUNSALUS. UCLA, Los Angeles, Calif.
- H147.** Integration Host Factor Is Involved in Regulation of *Escherichia coli* Nitrate Reductase (*narGHJ*) Operon Expression. (239) I. SCHRODER\* and S. DAIRE. UCLA, Los Angeles, Calif.
- H148.** Regulation of *narK* Gene Expression in *Escherichia coli* by Oxygen, Nitrate, Nitrite, Molybdenum, and Iron. (241) T. SONNABEND\* and I. SCHROEDER. UCLA, Los Angeles, Calif.
- H149.** Identification and Characterization of a Third Gene (*narQ*) Required for Nitrate-Dependent Gene Regulation in *Escherichia coli*. (243) R. C. CHIANG\* and R. P. GUNSALUS. UCLA, Los Angeles, Calif.
- H150.** Identification of *narQ*, a Gene Encoding a Second Sensor for Nitrate Regulation of Anaerobic Respiration in *Escherichia coli* K-12. (245) R. S. RABIN\* and V. STEWART. Cornell Univ., Ithaca, N.Y.
- H151.** Alkaline Phosphatase Expression in *Escherichia coli*: Possible Regulation by DNA Topology. (247) T. M. AL-CORN,\* J. C. O'NEILL, R. J. WIGENT, and P. CAMPBELL. Philadelphia Col. of Pharmacy and Sci., Philadelphia, Pa., and Beaver Col., Glenside, Pa.
- H152.** *oxrA* (*fnr*) Suppressors Which Restore Anaerobic Induction in *rpoA* Mutants. (249) M.-J. LOMBARDO,\* J. JANCZAK, and C. G. MILLER. Univ. of Illinois, Urbana.
- H153.** Regulation of Cytochrome *aa<sub>3</sub>* in *Bradyrhizobium japonicum*. (251) C. GABEL\* and R. J. MAIER. Johns Hopkins Univ., Baltimore, Md.
- H154.** Gene Regulation in *Halobacterium halobium*: Possible Involvement of DNA Supercoiling in Oxygen Regulation. (253) C.-F. YANG\* and S. DASSARMA. Univ. of Massachusetts, Amherst.
- H155.** Cyclic AMP (cAMP)-cAMP Receptor Protein-Dependent Anaerobic Induction of a Mutant *pepT* Gene. (255) A. A. MANTIA\* and C. G. MILLER. Univ. of Illinois, Urbana.
- H156.** The *lct* Operon Encoding L-Lactate Permease and L-Lactate Dehydrogenase in *Escherichia coli*. (257) J. M. DONG, J. H. SCOTT, A. ARISTARKHOV, S. IUCHI, and E. C. C. LIN.\* Dept. of Microbiol. and Molecular Genetics, Harvard Med. Sch., Boston, Mass.
- H157.** Analysis of a Chromosomal Locus Involved in the Synthesis of Isocytochrome *c<sub>2</sub>* in *Rhodobacter sphaeroides*. (259) M. A. ROTT,\* V. C. WITTHUHN, and T. J. DONOHUE. Univ. of Wisconsin, Madison.
- H158.** Identification of an Additional Regulatory Gene Controlling Light Harvesting and Reaction Center Gene Expression in *Rhodobacter capsulatus*. (261) C. S. MOSLEY,\* C. E. BAUER, and H. GEST. Indiana Univ., Bloomington.
- H159.** Analysis of a Locus in *Rhodobacter sphaeroides* 2.4.1 Involved in Regulation of Photosynthetic Functions. (263) J. M. ERASO\* and S. KAPLAN. Univ. of Texas Health Sci. Ctr., Houston.
- H160.** Characterization of an Oxygen-Dependent Regulator of the *nuc* Operon of *Rhodobacter sphaeroides*. (265) M. S. WOOD\* and S. KAPLAN. Univ. of Texas Health Sci. Ctr., Houston.
- H161.** Genetic Characterization of  $\delta$ -Aminolevulinate-Dependent Regulation of Cytochrome *c<sub>2</sub>* Gene Expression in *Rhodobacter sphaeroides*. (267) B. SCHILKE\* and T. J. DONOHUE. Univ. of Wisconsin, Madison.

- H162.** Analysis of Complementary Chromatic Adaptation in the Cyanobacterium *Fremyella diplosiphon* Using In Vivo Footprinting and Two-Dimensional Polyacrylamide Gel Electrophoresis. (269) N. FEDERSPIEL,\* C. SCHMIDT, and T. RIDGEWAY. Univ. of Idaho, Moscow.
- H163.** Light Regulation of Gene Expression in *Rhodobacter capsulatus*. (271) J. J. BUGGY,\* M. W. SGANGA, and C. BAUER. Indiana Univ., Bloomington.

## Session 157 (H). TRANSLATION

- H164.** Effect of Temperature on Protein Chain Elongation Rate in *Escherichia coli*. (273) A. FAREWELL\* and F. C. NEIDHARDT. Univ. of Michigan, Ann Arbor.
- H165.** Unusual Event in the Synthesis of a *Bacteroides rumicola* B<sub>14</sub> Endoglucanase. (275) D. K. CHUNG, J. B. RUSSELL, and D. B. WILSON.\* Cornell Univ. and USDA-Agricultural Res. Service, Cornell Univ., Ithaca, N.Y.
- H166.** Phosphorylation Control of Bacterial Translation. (277) E. S. ROBERTSON and A. W. NICHOLSON.\* Wayne State Univ., Detroit, Mich.
- H167.** In Vitro Translation of Full-Length Transcript of Figwort Mosaic Virus. (279) R. S. RANU,\* S. GOWDA, H. SCHOLTHOF, F. C. WU, and R. J. SHEPHERD. Colorado State Univ., Fort Collins, and Univ. of Kentucky, Lexington.
- H168.** Conservation of Base Pairs within 16S rRNA Helices Disrupted in Temperature-Sensitive Mutants of *Escherichia coli*. (281) K. TRIMAN. Franklin & Marshall Col., Lancaster, Pa.
- H169.** High-Level Ribosomal Frameshift Error in the *argI* Message of *Escherichia coli*. (283) C. FU and J. PARKER.\* Southern Illinois Univ., Carbondale.
- H170.** Effects of Mutations in 4.5S RNA on Protein Synthesis in *Escherichia coli*. (285) D. BOURGAIZE\* and L. GIRARD. Colby Col., Waterville, Maine.
- H171.** Factors Increasing Protein Synthesis of the Eukaryotic Firefly Luciferase Gene in an *Escherichia coli* S30 Transcription/Translation Extract System. (287) G. BECKLER,\* D. THOMPSON, J. VAN HERWYNEN, and K. WOOD. Promega Corp., Madison, Wis.
- H172.** Functional Characterization of Elongation Factor Effector Domains. (289) E. S. YASKOWIAK\* and P. E. MARCH. Univ. of Med. and Dent. of New Jersey-Robert Wood Johnson Med. Sch., Piscataway.
- H173.** Mutation, Repair, and Codon Usage in *catC*, the Structural Gene for Muconolactone Isomerase in *Pseudomonas putida*. (291) G. KOWALCHUK,\* J. E. HOUGHTON, and L. N. ORNSTON. Dept. of Biol., Yale Univ., New Haven, Conn.
- H174.** Analysis of the 5' End of the *recA* mRNA. (293) X. JIN\* and G. M. WEINSTOCK. Univ. of Texas Med. Sch., Houston.
- H175.** Expression of the Overlapping Genes for an Arginine tRNA (*argU*) and a Defective Prophage Integrase of *Escherichia coli*. (295) D. F. LINDSEY and J. R. WALKER.\* Univ. of Texas, Austin.

## Session 158 (S). VIRAL DISEASES AND DIAGNOSTICS

- S10.** Evaluation of DNA Probes to Specific Detection by Nucleic Acid Hybridization of Human Respiratory Adenovirus. (297) F. GARCIA, G. GALLEGRO, M. DOMINGUEZ, and I. BORRERO.\* Microbiol. Dept. and Biol. Dept., Univ. del Valle, Cali, Colombia.

- S11.** Evaluation of HPV Profile, a New Dot Blot Test for Detecting an Expanded Set of Human Papillomavirus Types. (299) A. CULLEN,\* I. MIELZYNSKA, M. GREENBERG, and S. CHALLBERG. Digene Diagnostics, Inc., Silver Spring, Md., and Reid Inst., Southfield, Mich.
- S12.** Detection of Human Papillomavirus DNA in Cervical Specimens by a Fast, Highly Sensitive, Chemiluminescent Assay. (301) C. IMPRAIM, M. GARCIA, A. FERRIE, A. LORINCZ, and S. CHALLBERG.\* Digene Diagnostics, Inc., Silver Spring, Md.
- S13.** Isolation, Purification, and Characterization of the Causative Virus of Cowpea Golden Mosaic, a Serious Tropical Disease. (303) S. K. SRIVASTAVA\* and A. VARMA. Dept. of Microbiol., SSN Col., Delhi Univ. Alipur, Delhi, India, and Advanced Ctr. for Plant Virology, Indian Agricultural Res. Inst., New Delhi, India.
- S14.** Transformation of Human Keratinocytes by Herpes Simplex Virus 2 and Human Papillomavirus Types 16 and 18. (305) K. R. DHANWADA,\* L. GARRETT, K. D. THOMPSON, and C. JONES. Loyola Univ. of Chicago, Maywood, Ill.; Fred Hutchinson Cancer Res. Ctr., Seattle, Wash.; and Univ. of Nebraska, Lincoln.
- S15.** Crude Extracts from *Guirea senegalensis* Exhibit Antiviral Activity against Herpes Simplex Virus Type 2 In Vitro. (307) G. B. MULAMBA,\* M. R. KARIM, and G. N. K. MBUY. West Chester Univ., West Chester, Pa., and Univ. of Minnesota, Duluth.
- S16.** Epstein-Barr Virus Subtypes in Blood of Immunocompromised Hosts. (309) A. TELENTI, R. MALINVERNI, F. MARCHESI, A. MONTANDON, and D. GERMANN.\* Inst. of Med. Microbiol. and Dept. of Internal Med., Univ. of Berne, Berne, Switzerland.
- S17.** Epstein-Barr Virus (EBV) Antibody Patterns and Circulating EBV in Immunocompromised Hosts. (311) A. TELENTI, M. GORGIEVSKI, R. MALINVERNI, A. MONTANDON, D. GERMANN, and L. MATTER.\* Inst. of Med. Microbiol. and Dept. of Internal Med., Univ. of Berne, Berne, Switzerland.
- S18.** Polymerase Chain Reaction Detection of Cytomegalovirus DNA in the Cerebrospinal Fluid of AIDS Patients with Neurologic Disease. (313) R. BULLER,\* D. CLIFFORD, S. MOHAMMED, M. KEENER, and G. STORCH. Washington Univ. Sch. of Med., St. Louis, Mo., and St. Luke's Hosp., Chesterfield, Mo.
- S19.** Polymerase Chain Reaction for Diagnosis of Cytomegalovirus Hepatitis in Liver Transplant Recipients. (315) M. WOLFF,\* K. RAND, and H. HOUCK. Univ. of Florida, Gainesville.
- S20.** Detection of a Human Cytomegalovirus Late mRNA by a Reverse Polymerase Chain Reaction. (317) J. GOZLAN,\* F. CABURET, and J. C. PETIT. Hôpital Saint-Antoine, Paris, France.
- S21.** Sample Treatment for Detection of Cytomegalovirus in Cell Cultures. (319) J. MENDOZA,\* J. M. NAVARRO, M. ROSA, M. D. ROJO, and A. ROJAS. Microbiol., Virgen de las Nieves Hosp., Granada, Spain.
- S22.** Lack of Recovery of Cytomegalovirus (CMV) from the Cerebrospinal Fluid of Immunocompromised Individuals with Active CMV Infections. (321) S. HENRY,\* M. HOLM, and H. H. BALFOUR, JR. Univ. of Minnesota Health Sci. Ctr., Minneapolis.
- S23.** Quantitative Detection of Cytomegalovirus Polymerase Chain Reaction Products by High-Pressure Liquid Chromatography in Peripheral Blood Leukocytes. (323) A. CHAN,\* M. KRAJDEN, J. ZHAO, L. DUNKLEY, H. DEDIER, and E. P. DIAMANDIS. Dept. of Microbiol. and Clin. Biochemistry, Toronto Hosp., and Univ. of Toronto, Toronto, Ontario, Canada.
- S24.** Useful Serological Criterion for Diagnosis of Cytomegalovirus Reactivation. (325) L. HERRERO,\* R. DUARTE, and K. A. VISONA. Univ. of Costa Rica and Louisiana State Univ.-Internat. Ctr. for Med. Res. and Training, San José, Costa Rica.
- S25.** Purification and Properties of a Casein Kinase Activity from a Human Cytomegalovirus-Transformed Cell Line (327) R. BERNAL,\* A. FISCHER, A. MOLINA, J. HERNANDEZ, and P. MUGANDA. Univ. of Texas, El Paso.
- S26.** Cytomegalovirus Infection: Case Report. (329) P. EDGAR,\* D. N. HERNDON, and J. P. HEGGERS. Shriners Burns Inst. and Univ. of Texas Med. Branch, Galveston.
- S27.** Prospective Evaluation of an Automated Microparticle Enzyme Immunoassay (IMx System, Abbott) for Detection of Serum Cytomegalovirus Immunoglobulin G (IgG) and IgM Antibodies. (331) P. C. GILL,\* A. L. PETERSON, C. L. DIRKSEN, A. ERICE, and H. H. BALFOUR, JR. Univ. of Minnesota Health Sci. Ctr., Minneapolis.
- S28.** Interaction of Human Herpesvirus Type 6 and Human T-Lymphotropic Virus Type 1 (HTLV-1) in HTLV-1-Transformed T Cells. (333) W. CAO\* and D. C. SULLIVAN. Univ. of Mississippi Med. Ctr., Jackson.
- S29.** Indirect Immunofluorescence Assay To Detect Varicella Virus in MRC-5 Cell Culture. (335) K. ABRAHAM,\* M. F. VARILLA, and M. A. CARSON. West Point, Pa.
- S30.** DNA Sequencing and Transcriptional Analyses of the UL3 and UL4 Genes of Equine Herpesvirus 1. (337) Y. ZHAO,\* V. R. HOLDEN, R. N. HARTY, and D. J. O'CALLAGHAN. Louisiana State Univ. Med. Ctr., Shreveport.
- S31.** Immunosuppression in Suid Herpesvirus I Asymptomatic Carrier Phase-Infected Miniature Pigs. (339) P. P. WILLIAMS. Nat. Animal Disease Ctr., VSRU, USDA, Agricultural Res. Service, Ames, Iowa.
- S32.** Method for Target DNA Detection Utilizing Alkaline Phosphatase, Digoxigenin-dUTP, and Chemiluminescent Substrate. (341) H. ROGERS\* and D. GOODALL. Indiana Univ. Sch. of Med.-Evansville Ctr., Evansville.
- S33.** Prevalence of ICMRT Non-A, Non-B Markers in Different Risk Populations. (343) L. TAYLOR,\* K. A. VISONA, C. VARGAS, and M. AGUILAR. Louisiana State Univ.-Internat. Ctr. for Med. Res. and Training, San José, Costa Rica.
- S34.** Prevalence of Hepatitis C Virus Compared with Hepatitis B Virus in Central America. (345) K. A. VISONA,\* D. PETERSON, L. VINELLI, G. DE HERNANDEZ, and L. TAYLOR. Louisiana State Univ.-Internat. Ctr. for Med. Res. and Training, San José, Costa Rica; Abbott, Chicago, Ill.; Red Cross, Honduras and El Salvador.
- S35.** Comparison of Enzyme Immunoassays for the Detection of Markers of Hepatitis Virus Infection. (347) T. L. GREENE,\* H. A. FIELDS, and M. HANSON. CDC, Atlanta, Ga., and Mem. Blood Ctr., Minneapolis, Minn.
- S36.** Syva Microtrak II Hepatitis System: Evaluation of New Microwell Assays for Hepatitis A Antibodies. (349) S. J. CHEW,\* C. T. TROISI, and H. I. KIM. Damon Reference Lab., Newbury Park, Calif., and Baylor Col. of Med., Houston, Tex.
- S37.** Chemiluminescent Assay for the Detection of Hepatitis B Virus DNA in Serum Using a Digoxigenin-Labeled Probe. (351) T. MORRIS,\* M. GALLAGHER, and H. FIELDS. Hepatitis Branch, Nat. Ctr. for Infectious Diseases, CDC, Atlanta, Ga.
- S38.** Evaluation of a New Immunoglobulin M Anti-Hepatitis B Core Assay. (353) B. BETLACH\* and C. TROISI. Sacramento Med. Fdn. Ctr. for Blood Res., Sacramento, Calif., and Baylor Col. of Med., Houston, Tex.
- S39.** Evaluation of Enzyme Immunoassay Methods for Hepatitis B Surface Antigen and Antibody. (355) M. HANSON,\* B. BETLACH, and P. GARRETT. Mem. Blood Ctr. of Minne-

- apolis, Minn.; Sacramento Blood Ctr., Sacramento, Calif., and Boston Biomedica, Inc., West Bridge, Mass.
- S40.** Antibodies to Hepatitis B Virus Pre-S Derived Synthetic Peptides as Serological Marker. (357) M. S. RAJAGOPALAN,\* K. V. S. RAO, P. SRIDHAR, A. RAJPUT, and H. E. BLUM. Nat. Inst. of Immunology and Internat. Ctr. for Genetic Engineering & Biotechnology, New Delhi, India, and Univ. Hosp., Zurich, Switzerland.
- S41.** Evaluation of the MicroTrak II Hepatitis B e Antigen and Antibody Assays in a Clinical Setting. (359) C. TROISI\* and M. HANSON. Baylor Col. of Med., Houston, Tex., and Mem. Blood Ctr., Minneapolis, Minn.
- S42.** Hybrid Capture HBV DNA Assay: a Fast and Sensitive Chemiluminescent Test for Quantitation of Hepatitis B Virus DNA in Human Serum. (361) M. GARCIA,\* J. LAZAR, C. IMPRAIM, S. CHALLBERG, A. DIBISCEGLIE, and A. LORINCZ. Digene Diagnostics, Inc., Silver Spring, Md., and NIH, Bethesda, Md.
- S43.** Quantitative Detection of Hepatitis B Virus DNA in Human Sera. (363) D. A. HENDRICKS,\* B. S. HOO, B. J. RATHBUN, M. YANO, M. S. URDEA, and P. D. NEUWALD. Chiron Corp., Emeryville, Calif., and WHO Collaborating Ctr. for Reference and Res. on Viral Hepatitis, Nagasaki, Japan.
- S44.** Quantitation of Hepatitis C Viral RNA in Serum or Plasma. (365) J. C. WILBER,\* P. J. JOHNSON, P. J. DAILEY, C. S. CHAN, R. SANCHEZ-PESCADOR, P. D. NEUWALD, and M. S. URDEA. Chiron Corp., Emeryville, Calif.

## POSTER SESSIONS

Thursday, 3:00-4:30 P.M., Exhibit Hall C

(Board numbers in parentheses)

### Session 159 (C). VIRAL DETECTION II

- C160.** Evaluation of the VIDAS HSV Assay. (002) J. K. HOUGLAND,\* R. L. HOPFER, and J. H. BOWDRE. Univ. of North Carolina Hosp., Chapel Hill.
- C161.** Survey of Clinical Specimens for Herpesvirus DNA Sequences by Polymerase Chain Reaction. (004) M. J. ESPY\* and T. F. SMITH. Mayo Clin. and Fndn., Rochester, Minn.
- C162.** Comparison of the New Ortho Herpes Simplex Virus Antigen Enzyme Immunoassay on Direct Specimens and Spin-Enhanced Cultures versus Traditional Cell Culture. (006) I. PATTERSON and K. REKRUT.\* Kaiser Permanente Regional Virus Lab., N. Hollywood, Calif.
- C163.** Detection of Herpes Simplex Virus Polymerase Chain Reaction (PCR) Product by Using a Digoxigenin-Labeled, PCR-Produced Probe. (008) B. HARRISON,\* M. J. BANKOWSKI, N. B. WOOD, L. KERNS, G. TRENHOLME, C. BENSON, M. E. PEEPLES, and A. LANDAY. Rush-Presbyterian-St. Luke's Med. Ctr., Chicago, Ill., and Diagnostic Services, Inc./Naples Community Hosp., Naples, Fla.
- C164.** Polymerase Chain Reaction for Detection of Herpes Simplex Virus from Cerebrospinal Fluid of Patients with Acute Meningoencephalitis. (010) J. ASLANZADEH,\* D. R. OSMON, M. P. WILHELM, and T. F. SMITH. Univ. of Connecticut Health Ctr., Farmington, and Mayo Clin., Rochester, Minn.
- C165.** Evaluation of a New Monoclonal Antibody Stain for Detection of Herpes Simplex Virus from Clinical Specimens. (012) S. L. JOHNSTON. Virology Lab., St. Vincent Hosp., Green Bay, Wis.
- C166.** Evaluation of an Improved Enzyme-Linked Immunosorbent Assay for Direct Detection of Herpes Simplex Virus and/or Culture Confirmation after Growth in Spin-Amplified Culture. (014) B. A. BODY,\* D. L. WILLIS, W. H. CARSON, and M. R. ROBERTS. Roche Biomed. Lab., Inc., Burlington, N.C.
- C167.** Evaluation of the Vitek Vidas HSV Assay versus Shell Vial Culture for the Detection of Herpes Simplex Virus in Patient Specimens. (016) A. M. MCNAMARA, J. CALLAWAY,\* and S. SELEPAK. NIH, Bethesda, Md.
- C168.** Detection of Herpes Simplex Virus Antigen in Clinical Specimens by a Sensitive Enzyme Immunoassay. (018) P. D. SWENSON,\* R. W. CONE, A. C. HOBSON, M. REMINGTON, and L. COREY. Seattle-King County Dept. of Publ. Health and Univ. of Washington, Seattle.
- C169.** Detection and Differentiation of Human T-Lymphotropic Virus Type I and II DNA in Intravenous Drug Abusers. (020) T. FRENKL,\* D. GALLO, C. HANSON, S. KWOK, J. SNINSKY, and R. POTTATHIL. Roche Diagnostic Systems, Inc., Fair Lawn, N.J.; California Dept. of Health Services, Berkeley; and Cetus Corp., Emeryville, Calif.
- C170.** Simultaneous Detection of Human Immunodeficiency Virus Type I Targets and an HLA DQ $\alpha$  Control Target in a Multiplexed Polymerase Chain Reaction Assay. (022) J. S. KLEIN\* and C. B. INDERLIED. Childrens Hosp. Los Angeles and USC, Los Angeles, Calif.
- C171.** Evaluation of a Rapid Influenza A Enzyme Immunoassay in Comparison with Indirect Immunofluorescence, Centrifugation Culture, and Conventional Culture. (024) H. BLOY and S. L. JOHNSTON.\* Virology Lab., St. Vincent Hosp., Green Bay, Wis.
- C172.** Rapid Detection of Measles Virus Using Immunofluorescence. (026) R. L. HODINKA,\* R. L. STETSER, and J. WAINWRIGHT. Children's Hosp. of Philadelphia, Philadelphia, Pa.
- C173.** Detection of Human Papillomavirus in Urine and Biopsy Specimens from Male Patients by Polymerase Chain Reaction. (028) C. H. WU,\* M. F. LEE, D. M. YANG, and S. F. CHENG. Taichung Veterans Gen. Hosp. and China Med. Col., Taichung, Taiwan, Republic of China.
- C174.** Evaluation of the VIDAS RSV Antigen Assay. (030) K. WESTFALL,\* J. K. HOUGLAND, and J. BOWDRE. Univ. of North Carolina Hosp., Chapel Hill.
- C175.** Comparison of Rapid Methods for Respiratory Syncytial Virus Detection. (032) S. RUETHER,\* L. PAUL, and C. R. LIBERTIN. Loyola Univ. of Chicago, Maywood, Ill.
- C176.** Comparison of Improved Directigen RSV with Testpack and Viral Culture for Diagnosis of Respiratory Syncytial Virus Infection. (034) C. G. WREN,\* H. B. MASTERS, B. J. BATE, J. C. CLARK, P. YOUNG, J. A. ALLAMAN, S. A. SCHNEIDER, and A. WEINBERG. Univ. of Colorado Sch. of Med., Denver.
- C177.** Direct Fluorescent Antibody Testing Is Crucial for Detection of Respiratory Syncytial Virus in Nasopharyngeal Specimens Collected from Remote Locations. (036) D. CAUEFFIELD,\* M. A. NEUMANN, and M. J. BANKOWSKI. Diagnostic Services, Inc., and Naples Community Hosp., Naples, Fla.
- C178.** Comparison of Abbott Test Pack, Kallestad Pathfinder, and Becton Dickinson Directigen for Detection of Respiratory Syncytial Virus Antigen in Respiratory Samples. (038) T. J. MASON\* and D. S. LELAND. Indiana Univ. Med. Ctr., Indianapolis.
- C179.** Rapid, Fully Automated Enzyme-Linked Fluorescent Assay for Direct Detection of Rotavirus Antigen from Fecal Specimens. (040) T. MCGOVERN\* and F. LIMMONE. BioMerieux Vitek, Inc., Rockland, Mass., and BioMerieux, S.A., Lyon, France.
- C180.** Comparison of Difco Rota-CUBE and API Rotavirus Test Kit for Detection of Rotavirus in Pediatric Specimens. (042) J. GREATOREX,\* G. M. THORNE, S. SPENCER,

and K. MCINTOSH. Children's Hosp. and Harvard Med. Sch., Boston, Mass.

### Session 160 (E). IMPROVED METHODS OF PROTECTIVE IMMUNITY: GENETICALLY ATTENUATED ORGANISMS AND CONJUGATE VACCINES

- E66. Octylglucopyranoside-Extracted Major Outer Membrane Protein as an Antitrichoma Vaccine? (044) J. WHITTUM-HUDSON,\* T. P. O'BRIEN, M. CAMPOS, S. PAL, H. R. TAYLOR, and R. A. PRENDERGAST. Johns Hopkins Univ., Baltimore, Md., and Univ. of Melbourne, Melbourne, Australia.
- E67. Immunogenicity of Gonococcal Pilin Peptides Conjugated to Diphtheria Toxoid or Encapsulated in Liposomes. (046) K. RAMSEY,\* H. COLLINS, R. RICHARDS, C. ALVING, and C. DEAL. Walter Reed Army Inst. of Res., Washington, D.C.
- E68. Phase II Clinical Study with an Anti-*Haemophilus influenzae* Type b (Hib) Conjugate Vaccine Containing CRM 197 as Carrier for Capsular Hib Oligosaccharide. (048) P. COSTANTINO, S. VITI, A. PODDA, M. G. GALLI, C. LAZZERONI, L. NENCIONI,\* and R. RAPPUOLI. Sclavo Res. Center, Siena, Italy, and Inst. of Hygiene, Univ. of Milan, Milan, Italy.
- E69. Recombinant Hybrids of *Haemophilus influenzae* Outer Membrane Lipoproteins as Vaccine Candidates. (050) R. A. DEICH,\* A. ANILIONIS, J. P. FULGINITI, T. QUINNDEY, G. ZLOTNICK, and B. A. GREEN. Praxis Biologics, Rochester, N.Y.
- E70. Preparation and Characterization of Oligosaccharide-Protein Conjugates to *Neisseria meningitidis* Lipooligosaccharide. (052) X.-X. GU\* and C.-M. TSAI. Ctr. for Biologics Evaluation and Res., FDA, Bethesda, Md.
- E71. Phase I Clinical Study of a Conjugate Vaccine against Meningococcus A and C. (054) P. COSTANTINO, S. VITI, A. PODDA, M. A. VELMONTE, M. BARTALINI, L. NENCIONI,\* and R. RAPPUOLI. Sclavo Res. Center, Siena, Italy, and Univ. of the Philippines, Manila, Philippines.
- E72. Cholera Toxin B-Subunit Expression by *ctxA* *Vibrio cholerae* O1 Deletion Mutants. (056) P. A. FOXALL, A. P. D. SILVEIRA, and R. H. HALL.\* Div. of Infectious Diseases, Univ. of Maryland Sch. of Med., Baltimore, and Div. of Microbiol., FDA, Washington, D.C.
- E73. Protecting Fish against Vibriosis by Immunization with Genetically Attenuated Live *Vibrio anguillarum*. (058) J. T. SINGER,\* K. A. SCHMIDT, and C. A. HOPPER. Univ. of Maine, Orono.
- E74. Isolation of Temperature-Sensitive Mutants of *Escherichia coli* for the Development of a Vaccine Strain. (060) T. S. AGIN\* and A. MORRIS-HOOKE. Miami Univ., Oxford, Ohio.
- E75. Protective Immunity against *Yersinia pseudotuberculosis* Induced by Invasin. (062) M. SIMONET,\* I. RAZAFIMANANTSOA, J. L. BERETTI, and P. BERCHE. Lab. de Microbiol., Faculté de Méd., Necker-Enfants Malades, Paris, France.
- E76. Persistence and Immunogenicity of Temperature-Sensitive Mutants of *Salmonella enteritidis* after Intra-gastric Immunization. (064) M. M. GHERARDI, V. E. GARCIA, D. O. SORDELLI, V. BRIZIO, and M. C. CERQUETTI.\* CEF-YBO-CONICET and Univ. of Buenos Aires, Buenos Aires, Argentina.
- E77. Comparative Studies of Adherence and Invasiveness of *Salmonella typhi* Ty 2 and Its Temperature-Sensitive Deriva-

ts. ts 51-1. (066) B. J. ZELIGS,\* E. REY, R. FRIEDLANDER, M. J. MALAVASIC, and J. A. BELLANTI. Georgetown Univ. Sch. of Med., Washington, D.C.

- E78. Effect of *Salmonella* Carrier in Modulating Host Responses to Expressed Cloned Surface Protein Antigen A (SpaA) of *Salmonella sobrinus*. (068) T. K. REDMAN,\* C. C. HARMON, G. J. RICHARDSON, N. K. CHILDERS, and S. M. MICHALEK. Univ. of Alabama, Birmingham.
- E79. Live Oral  $\Delta$ *cya*  $\Delta$ *crp* *Salmonella typhimurium*  $\chi$ 3985 Vaccine Strain Protects Chickens from Challenge with Virulent *Salmonella* Serotypes. (070) J. O. HASSAN\* and S. M. KELLY. Washington Univ., St. Louis, Mo.
- E80. Immunoglobulin G Responses of Periodontitis and Diabetic Subjects to Outer Membrane Proteins of *Porphyromonas gingivalis*. (072) J. DYER,\* M. PECK, R. REINHARDT, and C. MAZE. Univ. of Nebraska Med. Ctr., Col. of Dent., Lincoln.
- E81. Temperature-Sensitive Mutants of *Staphylococcus aureus*: Isolation and Preliminary Characterization. (074) D. O. SORDELLI,\* M. F. IGLESIAS, M. CATALANO, and A. MORRIS-HOOKE. Univ. of Buenos Aires Med. Sch., Buenos Aires, Argentina, and Miami Univ., Oxford, Ohio.

### Session 161 (N). PLANT-MICROBE INTERACTIONS

- N48. Organization of Cellulose Synthesis Genes from *Agrobacterium tumefaciens*. (076) A. G. MATTHYSSE\* and T. ROSCHE. Univ. of North Carolina, Chapel Hill.
- N49. Altered Function Mutations of VirG in *Agrobacterium tumefaciens*. (078) C.-Y. CHEN,\* D. C. HAN, and S. C. WINANS. Sect. of Microbiol., Cornell Univ., Ithaca, N.Y.
- N50. Evidence of Conjugation of the IAA Plasmid of *Pseudomonas syringae* subsp. *savastanoi*. (080) S. E. SILVERSTONE. California State Univ., Bakersfield.
- N51. DNA Base Ratios and Hexose Catabolism of *Azolla*-Associated *Arthrobacter* Species. (082) B. T. SHANNON,\* J. E. GATES, and S. M. MCCOWEN. Virginia Commonwealth Univ., Richmond.
- N52. Use of *TnphoA* Mutagenesis To Probe Interactions between *Pseudomonas putida* GR12-2 and Canola. (084) C. BAYLISS,\* G. BROWN, B. LASBY, and J. M. WOOD. Univ. of Guelph, Guelph, Ontario, Canada, and ESSO Ag Biologicals, Saskatoon, Saskatchewan, Canada.
- N53. Comparative Analysis of Fatty Acid and Protein Profiles of Potato Scab-Inducing Bacteria. (086) E. PARADIS, C. N. HODGE, R. E. STALL, and C. BEAULIEU.\* Univ. of Sherbrooke, Sherbrooke, Quebec, Canada, and Univ. of Florida, Gainesville.
- N54. Terrestrial Halophilic Bacteria: Normal Inhabitants of Desert Plants. (088) R. D. SIMON\* and S. BELKIN. Biol., SUNY-Geneseo, Geneseo, N.Y., and Blaustein Inst. for Desert Res., Sede Boker, Israel.
- N55. Do Bacteriocins Affect the Succession of Bacteria Infecting Newly Injured Cactus Tissue? (090) J. L. M. FOSTER\* and J. C. FOGLEMAN. Metropolitan State Col. of Denver and Univ. of Denver, Denver, Colo.
- N56. Activated/Germinated *Aspergillus amstelodami* Spores Grow on Dried-Rehydrated Leaves but Not Live Leaves. (092) R. ALBERT. TransAgra Int., Storm Lake, Iowa, and Chr. Hansen's Labs, Milwaukee, Wis.
- N57. Effect of NaCl and Ethanol on Alginate Production by Fluorescent *Pseudomonads* In Vitro. (094) S. SINGH,\* B. KOEHLER, and W. F. FETT. Dept. of Chemistry, Pennsylvania State Univ., Hazleton, and Eastern Regional Res. Ctr., USDA, Agricultural Res. Service, Philadelphia, Pa.



- N58.** Effect of Soil Moisture and Organic Amendment on Survival of *Fusarium oxysporum* and *Trichoderma harzianum*. (096) M.-M. KAO\* and T.-S. HSEIH. Nat. Cheng Kung Univ., Tainan, Taiwan, Republic of China.
- N59.** Induction of Substrate-Specific Extracellular Polypeptides in the Biological Control Fungus *Gliocladium virens*. (098) A. VAN TILBURG and M. THOMAS.\* Texas A&M Univ. and USDA, Agricultural Res. Service, College Station.

### Session 162 (Q). GENERAL ENVIRONMENTAL MICROBIOLOGY

- Q169.** Isolation and Partial Characterization of an Anaerobic Bacterium Capable of Utilizing Perchlorate as an Electron Acceptor. (100) H. ATTAWAY\* and M. SMITH. ManTech Environmental Technologies, Inc., and U.S. Air Force, AFCE-SA, Tyndall Air Force Base, Fla.
- Q170.** mRNA Analysis of Rubisco Gene Expression and Carbon Fixation in Natural Marine Phytoplankton Populations. (102) S. L. PICHARD,\* M. E. FRISCHER, and J. H. PAUL. Univ. of South Florida, St. Petersburg.
- Q171.** Iodine Susceptibility of Mucoïd and Nonmucoïd *Pseudomonas aeruginosa* in Relation to Extracellular Polysaccharide Production. (104) J. J. SMITH,\* B. H. PYLE, and G. A. MCFETERS. Microbiol. Dept., Montana State Univ., Bozeman.
- Q172.** Factors Influencing Resistance to Iodine by a Biofilm of *Pseudomonas aeruginosa* Are More Dependent on Cell Density than Physiological State. (106) M. L. BROWN\* and J. J. GAUTHIER. Univ. of Alabama, Birmingham.
- Q173.** Variability and Partitioning of DNA in an Oligotrophic, Sewage-Contaminated Sandy Aquifer. (108) D. W. METGE\* and R. W. HARVEY. U.S. Geological Survey, Boulder, Colo.
- Q174.** Regulation of Bacterial Penetration by the Geophysicochemical Environment. (110) P. K. SHARMA. Univ. of Oklahoma, Norman.
- Q175.** Microbiological Profile of Persian Gulf Sand. (112) D. M. ROLLINS, R. L. HABERBERGER, E. M. LANE,\* I. BROOK, A. L. RICHARDS, and K. C. HYAMS. Naval Med. Res. Inst., Nat. Naval Med. Ctr., and Armed Forces Radiobiology Res. Inst., Bethesda, Md.
- Q176.** Impact of Toxic Organic Chemicals on Hydrogenotrophic Methanogenesis. (114) I. S. KIM,\* J. C. YOUNG, and H. H. TABAK. Univ. of Cincinnati, Cincinnati, Ohio; Pennsylvania State Univ., University Park; and U.S. EPA, Cincinnati, Ohio.
- Q177.** Comparison of Microbial Mass and Activity in Aerobically and Anaerobically Incubated Solid Waste. (116) D. E. JONES\* and R. J. MURPHY. Univ. of South Florida, Tampa.
- Q178.** Lipid Analysis of Microbial Populations To Detect Organic Enrichment. (118) R. H. FINDLAY\* and T. E. SAWYER. Dept. of Biochemistry, Microbiol. and Molecular Biol., and Ctr. for Marine Studies, Univ. of Maine, Walpole.
- Q179.** Complete Factorial Analysis of the Effects of Temperature on Biomass and Geosmin Synthesis by *Streptomyces tendae* and *Penicillium expansum*. (120) D. INGRAM\* and C. DIONIGI. USDA, Food Flavor Quality Unit, New Orleans, La.
- Q180.** Release of Microcystin from *Microcystis aeruginosa* Cells. (122) M. NAKANO,\* M. SHIRAI, K. KUSHIDA, M. ASAYAMA, K. HARADA, A. SATO, and T. AIDA. Jichi Med. Sch., Tochigi, Japan; Ibaraki Univ., Ibaraki, Japan; and Meijo Univ., Nagoya, Japan.
- Q181.** Interactions between Insecticidal Bacteria and Biocontrol Fungi. (124) P. A. W. MARTIN\* and S. MISCHKE. USDA, Agricultural Res. Service, Insect Biocontrol and Biocontrol of Plant Diseases Lab., Beltsville, Md.
- Q182.** Detection and Differentiation of the Microbial Insecticide *Bacillus thuringiensis* Strains by Specific Amplification of Toxin Gene Sequences Using Multiplex Polymerase Chain Reaction. (126) S. N. BOURQUE,\* J. MERCIER, J. R. VALERO, M. C. LAVOIE, and R. C. LEVESQUE. Laurentian Forestry Ctr., Laval Univ., Ste-Foy, Quebec, Canada.
- Q183.** Expression and Physiological Studies of a Genetically Altered Mosquitocidal Cyanobacterium. (128) R. C. MURPHY\* and S. E. STEVENS, JR. Memphis State Univ., Memphis, Tenn.
- Q184.** Mathematical Modeling of CO<sub>2</sub> and CH<sub>4</sub> Fluxes from Environmental Microbial Sources/Sinks. (130) D. LEWIS,\* W. SAID, and D. GATTIE. U.S. EPA and Technology Applications, Inc., Environmental Res. Lab., Athens, Ga.
- Q185.** Oxygen Sources for In Situ Subsurface Bioremediation. (132) S. J. VESPER, W. DAVIS-HOOVER,\* and L. C. MURDOCH. Dept. of Civil and Environmental Engineering, Univ. of Cincinnati, and U.S. EPA, Center Hill Lab., Cincinnati, Ohio.
- Q186.** Optimization of Solid Growth Medium for Isolation and Culture of Microorganisms from the Terrestrial Subsurface. (134) T. O. STEVENS,\* H. D. WATTS, J. J. WALKER, and J. K. FREDRICKSON. Pacific Northwest Lab., Richland, Wash.
- Q187.** Bacteria in the Deep Subsurface: a Factor in the Use of Ammonium in Clays as a Petroleum Exploration Tool? (136) M. WALSH,\* L. WILLIAMS, R. FERRELL, and R. PORTIER. Louisiana State Univ., Baton Rouge, and Arizona State Univ., Tempe.
- Q188.** Microbially Enhanced Oil Recovery: a Field Study. (138) J. D. COATES,\* M. J. MCINERNEY, R. M. KNAPP, V. K. BHUPATHIRAJU, and J. L. CHISHOLM. Univ. of Oklahoma, Norman.
- Q189.** Microbially Enhanced Oil Recovery from Unconsolidated Carbonate Cores. (140) J. P. ADKINS\* and R. S. TANNER. Univ. of Oklahoma, Norman.
- Q190.** Facultatively and Obligately Anaerobic Bacteria from the Deep Subsurface. (142) M. ROTHSCHILD,\* S. E. STEVENS, JR., and K.-T. CHUNG. Memphis State Univ., Memphis, Tenn.
- Q191.** Pentachlorophenol Effects on Microbial Community Function in Estuarine Sediment Microcosms. (144) J. KURTZ,\* T. BARKAY, R. DEVEREUX, and R. B. JONAS. EPA Gulf Breeze Environmental Res. Lab., Gulf Breeze, Fla., and George Mason Univ., Fairfax, Va.

### Session 163 (Q). BIOTRANSFORMATION AND DEGRADATION II: AROMATICS AND HALOGENATED AROMATICS

- Q192.** Biotransformation of Monochlorobenzoates under Different Reducing Conditions in Nile River Sediments. (146) J. KAZUMI,\* M. M. HAGGBLOM, and L. Y. YOUNG. Dept. of Microbiol. and Environmental Med., NYU Med. Ctr., New York, N.Y.
- Q193.** Degradation of 3-Chloro, 4-Hydroxybenzoate in Freshwater Sediment. (148) X. ZHANG\* and J. WIEGEL. Dept. of Microbiol. and Ctr. for Biol. Resource Recovery, Univ. of Georgia, Athens.
- Q194.** Reductive Dehalogenation of Chlorophenols by *Desulfomonile tiedjei* DCB-1. (150) W. W. MOHN\* and K. J. KENNEDY. Nat. Res. Council Canada, Ottawa, Ontario, Canada.
- Q195.** Effects of Heavy Metals on Reductive Dechlorination of Chlorophenols in Anoxic Freshwater Sediment. (152) I.-C.

KONG,\* D. A. WUBAH, and W. J. JONES TAI, Univ. of Georgia, and U.S. EPA, Athens.

**Q196.** Anaerobic Degradation of Chlorinated Anisole. (154) J. A. LADAPPO\* and J. E. ROGERS. Univ. of Georgia and U.S. EPA, Athens.

**Q197.** Enrichment and Isolation of a Novel Bacterium Growing by Anaerobic Reductive Dehalogenation of 2-Chlorophenol. (156) A. L. FOXWORTHY, W. W. MOHN, and J. R. COLE.\* Michigan State Univ., East Lansing.

**Q198.** Anaerobic Degradation of Halogenated Phenols by a Sulfate-Reducing Consortium. (158) M. M. HAGGBLOM,\* M. D. RIVERA, D. OLIVER, and L. Y. YOUNG. NYU Med. Ctr., New York, N.Y.

**Q199.** Degradation of 2,4,6-Tribromophenol by Mixed Bacterial Cultures Enriched from the Burrows of *Saccoglossus kowalevskii*, a Bromophenol-Producing Marine Worm. (160) C. C. STEWARD,\* T. C. DIXON, and C. R. LOVELL. Univ. of South Carolina, Columbia.

**Q200.** Aerobic and Anaerobic Dehalogenation of Nitrapyrin by the Ammonia-Oxidizing Bacterium *Nitrosomonas europaea*. (162) T. VANNELLI\* and A. B. HOOPER. Univ. of Minnesota, St. Paul.

**Q201.** Degradation of Mixed Chloro- and Methyl-Aromatic Compounds by Bacterial Pure Cultures and Consortia. (164) S. W. HOOPER\* and J. T. MCINTIRE. Univ. of Mississippi, University.

**Q202.** Distribution of Plasmid- and Chromosome-Mediated Catabolism of Chlorobenzoates in *Pseudomonas putida* P111. (166) V. BRENNER,\* B. S. HERNANDEZ, and D. D. FOCHT. Univ. of California, Riverside, and Univ. de Panama, Panama.

**Q203.** Productive *meta* Cleavage of a Chloromethyl Catechol by *Pseudomonas cepacia* MB2. (168) F. K. HIGSON\* and D. D. FOCHT. Univ. of California, Riverside.

**Q204.** Effect of Environmental and Matrix Conditions on the Biotreatability of Polychlorinated Biphenyls-Contaminated Soils and Sludges. (170) M. J. R. SHANNON,\* R. K. ROTHMEL, S. BLANCHARD, and R. UNTERMAN. Envirogen, Inc., Lawrenceville, N.J.

**Q205.** Biodegradation of Chlorobenzene and Nitrobenzene in Sludge. (172) R. J. STEFFAN\* and A. F. THOMAS. Envirogen Inc., Lawrenceville, N.J.

**Q206.** Usefulness of DNA Probes for the Isolation of Efficient Polychlorinated Biphenyl-Degrading Bacteria from Toxic Chemical-Contaminated Environments. (174) A. A. KHAN and S. K. WALIA.\* Oakland Univ., Rochester, Mich.

**Q207.** Molecular Analysis of the Pathway for Dibenzofuran Degradation by *Sphingomonas* sp. Strain RW1. (176) B. AVERHOFF,\* B. HAPPE, H. POTH, and K. TIMMIS. Nat. Res. Ctr. for Biotechnology, Braunschweig, Germany.

**Q208.** Transformation of Anisole and Phenetole by Aerobic Cultures of Bacteria. (178) S. M. RESNICK\* and D. T. GIBSON. Dept. of Microbiol., Univ. of Iowa, Iowa City.

**Q209.** In Situ Degradation of *m*-Cresol in Creosote-Contaminated Soil. (180) B. EVANSHEN, C. KNIGHT, A. ZASLOW, P. R. SCHEUERMAN,\* and G. R. LANZA. East Tennessee State Univ., Johnson City.

**Q210.** Expansion of the Range of Chloroaromatic Compounds Degraded by the Trichloroethylene-Degrading Strain *Pseudomonas cepacia* G4 5223 Phe1. (182) R. R. GERGER\* and M. S. SHIELDS. Univ. of Wisconsin, La Crosse; U.S. EPA Environmental Res. Lab., Gulf Breeze, Fla.; and Ctr. for Environmental Diagnostics and Bioremediation, Univ. of West Florida, Pensacola.

**Q211.** Mechanistic Study of the Inhibition of Pentachlorophenol Degradation in *Pseudomonas* sp. Strain RA2. (184) P. M. RADEHAUS,\* M. SCHWIERSKOTT, and S. K. SCHMIDT. Univ. of Colorado, Boulder.

**Q212.** Role of *cis,cis*-Muconate in Activation of the *catBC* Operon Involved in Benzoate Degradation in *Pseudomonas putida*. (186) M. R. PARSEK,\* D. SHINABARGER, and R. K. ROTHMEL. Univ. of Illinois, Chicago.

**Q213.** *CleR* Binds and Autoregulates the *cacR* Promoter and Inducibly Activates the *clcA* Promoter. (188) W. M. COCO. Univ. of Illinois, Chicago.

## Session 164 (H). GENOME STRUCTURE AND ANALYSIS

**H176.** Genome Size Estimation and Construction of a Macro-Restriction Map of *Klebsiella pneumoniae*. (190) A. RANDRIAMAHEFA, N. BAKH'ET, and J. RYU.\* Dept. of Microbiol., Loma Linda Univ., Loma Linda, Calif.

**H177.** Characterization of the Genome of *Pasteurella haemolytica* A1 by Pulse-Field Gel Electrophoresis. (192) R. Y. C. LO,\* M. A. WATT, and L. L. BURROWS. Dept. of Microbiol., Univ. of Guelph, Guelph, Ontario, Canada.

**H178.** Macrorestriction Mapping of the *Pseudomonas cepacia* 17616 Genome. (194) H. CHENG\* and T. G. LESSIE. Univ. of Massachusetts, Amherst.

**H179.** Dissection of *Salmonella typhimurium* Genome with Transposon Tn5(*psf*) Carrying Rare Restriction Enzyme Cutting Sites. (196) K. K. WONG\* and M. MCCLELLAND. California Inst. of Biol. Res., La Jolla.

**H180.** Macrorestriction Mapping of the Chromosome of *Treponema pallidum* subsp. *pallidum*. (198) E. M. WALKER,\* J. K. ARNETT, J. D. HEATH, and S. J. NORRIS. Univ. of Texas Med. Sch., Houston.

**H181.** Preliminary Physical Map of *Enterococcus hirae* ATCC 9790. (200) F. M. ZUCCON, L. A. SECHI, and L. DANEO-MOORE.\* Dept. of Microbiol. and Immunology, Temple Univ. Sch. of Med., Philadelphia, Pa.

**H182.** Chromosome Organization of *Streptococcus mutans* GS-5. (202) M. J. HANTMAN,\* S. SUN, P. J. PIGGOT, and L. DANEO-MOORE. Dept. of Microbiol. and Immunology, Temple Univ. Sch. of Med., Philadelphia, Pa.

**H183.** Genomic Organization of the Halophilic Archaeum *Haloferax mediterranei*. (204) P. LOPEZ, J. ANTON,\* J. P. ABAD, C. L. SMITH, and R. AMILS. Ctr. de Biol. Molecular, Univ. Autónoma de Madrid, Madrid, Spain, and Univ. of California and Lawrence Berkeley Lab., Berkeley.

**H184.** Genomic Repository for *Saccharomyces cerevisiae*. (206) T. FELDBLYUM,\* I. BRYAN, L. HOLLOWAY, and W. NIERMAN. American Type Culture Collection, Rockville, Md.

**H185.** A Chromosome-Compactness Mutant of *Deinococcus radiodurans*. (208) S. T. TAN,\* C. S. LIN, T. H. JU, and C. L. LIN. Inst. of Radiation Biol., Nat. Tsing Hua Univ., Hsinchu, Taiwan, Republic of China.

**H186.** Automated DNA Sequencing with Alternative Gel Sizes and Matrices. (210) S. ROEMER,\* L. MIDDENDORF, D. STEFFENS, and S. SUTTER. LI-COR Inc., Lincoln, Nebr.

**H187.** Detection of DNA and RNA Targets by Using Microtiter Plate Formats. (212) N. M. J. VERMEULEN,\* K. DIX, J. U'REN, and J. VAN NESS. Diagnostic Div., MicroProbe Corp., Bothell, Wash.

## Session 165 (K). ENZYMES

**K55.** Kinetic Analysis of Iodoacetate-Modified Histidine Ammonia Lyase: Role of Cys-273 in Enzyme Activity. (214) D. HERNANDEZ\* and A. T. PHILLIPS. Pennsylvania State Univ., University Park.

- K56.** Nucleotide Sequence of *tbaD*, the Gene Encoding Phenol Hydroxylase from *Pseudomonas putida* PK01, and Functional Analysis of the Encoded Peptide (216) J. J. KUKOR\* and R. H. OLSEN, Univ. of Michigan Med. Sch., Ann Arbor
- K57.** Site-Directed Mutagenesis of Phosphomannose Isomerase-GDP-Mannose Pyrophosphorylase Involved in the Biosynthesis of Alginate by Mucoid *Pseudomonas aeruginosa*. (218) T. B. MAY,\* D. SHINABARGER, and A. BOYD, Univ. of Illinois, Chicago
- K58.** Site-Directed Mutagenesis of the Essential Cysteine Residue in *Klebsiella aerogenes* Urease (220) P. R. MARTIN\* and R. P. HAUSINGER, Michigan State Univ., East Lansing
- K59.** Characterization and Cloning of a Membrane-Associated Lactate Dehydrogenase of *Neisseria meningitidis*. (222) A. I. ERWIN\* and E. C. GOTSCHLICH, Rockefeller Univ., New York, N.Y.
- K60.** Detection of Dehydrogenase Enzymes of *Blattella germanica*. (224) P. SUMMANEN\* and S. M. FINEGOLD, VA Wadsworth Med. Ctr. and UCLA Sch. of Med., Los Angeles, Calif.
- K61.** Topography of Anaerobic Respiration in Benzoate-Grown Dissimilatory Iron-Reducing Isolate GS-15 (226) J. E. CHAMPINE\* and S. GOODWIN, Univ. of Massachusetts, Amherst
- K62.** Role of Histidine-245 in Catalysis by *Escherichia coli* Thioredoxin Reductase as Probed by Site-Directed Mutagenesis. (228) S. B. MULROONEY\* and C. H. WILLIAMS, JR, Univ. of Michigan and Dept. of Veterans Affairs Med. Ctr., Ann Arbor.
- K63.** In Vivo Phosphorylation of Glutamate Dehydrogenase from *Escherichia coli*. (230) H.-P. P. LIN,\* M. T. TRÄURIG, and H. C. REEVES, Dept. of Microbiol., Arizona State Univ., Tempe.
- K64.** Identification of GlpB as the [FeS]-Containing Subunit of Anaerobic sn-Glycerol-3-Phosphate Dehydrogenase of *Escherichia coli*. (232) M. E. VARGA, R. ROTHERY, and J. H. WEINER,\* Univ. of Alberta, Edmonton, Alberta, Canada.
- K65.** Purification and Characterization of  $\beta$ -D-Glucuronidase from *Escherichia coli* K-12. (234) S. W. HUANG\* and T. C. CHANG, Food Industry Res. and Development Inst., Hsinchu, Taiwan, Republic of China.
- K66.** Lactate Oxidase: Site-Directed Mutagenesis of Residues Involved in Binding and Catalysis. (236) U. MUH,\* V. MASSEY, and C. H. WILLIAMS, JR, Univ. of Michigan and VA Med. Ctr., Ann Arbor.
- K67.** ADP-Ribosylation of Proteins in *Mycobacterium smegmatis*. (238) M. H. SERRES\* and J. C. ENSIGN, Univ. of Wisconsin, Madison.
- K68.** Low-Molecular-Weight Thiols in Phototrophic Anoxygenic Bacteria. (240) W. M. HIPPE\* and H. G. TRUPER, Univ. of Bonn, Inst. of Microbiol. and Biotechnology, Bonn, Germany.
- K69.** Purification and Properties of Macrolide Reductase from *Streptomyces fradiae*. (242) S.-L. HUANG,\* T. C. HASSELL, and W.-K. YEH, Eli Lilly and Co., Indianapolis, Ind.
- K70.** Haloperoxidase from *Streptomyces aurcofaciens* Tu24: Reaction Mechanism and Biological Function. (244) K. H. VAN PEE,\* H. HACKER, T. HAAG, and F. LINGENS, Inst. für Mikrobiologie, Univ. Hohenheim, Stuttgart, Germany.
- K71.** Purification and Characterization of Phosphoenolpyruvate Carboxykinase from *Anaerobiospirillum succiniciproducens*. (246) S. PODKOYROV\* and J. G. ZEIKUS, Michigan State Univ., East Lansing, and Michigan Biotechnology Inst., Lansing.
- K72.** Purification and Characterization of Selenate Reductase from a Selenate-Respiring Organism. (248) S. RECH\* and J. MACY, Univ. of California, Davis.
- K73.** Molecular Structure of *Rhodobacter lactatibadius* Protease I: a Yeast-Lytic Serine Protease Having Mannose Binding Activity (250) H. SHIMOI,\* Y. HIMURA, I. OHATA, and M. TADENUMA, Nat. Res. Inst. of Brewing, Tokyo, Japan
- K74.** (+)-Mandelate Dehydrogenase from *Rhodospirillum rubrum* Is a Flavocytochrome (252) M. YASIN and C. A. FEWSON,\* Univ. of Glasgow, Glasgow, Scotland
- K75.** Properties of Methanol Dehydrogenase from *Pseudomonas denitrificans* (254) V. I. DAVIDSON,\* J. WU, B. MILLER, I. HSU, JONES, and M. A. KUMAR, Univ. of Mississippi Med. Ctr., Jackson
- K76.** Purification and Characterization of 3-Hydroxybutyryl-Coenzyme A Dehydrogenase from *Clostridium beijerinckii* NRRL B593 (256) G. D. COLBY\* and J.-S. CHEN, Dept. of Anaerobic Microbiol., Virginia Polytechnic Inst. and State Univ., Blacksburg.
- K77.** *Methanobacterium thermoautotrophicum* Has Two Methylviologen Hydrogenase Activities (258) G. J. WOO,\* A. WASSERFALLEN, and R. S. WOLFE, Univ. of Illinois, Urbana, and Mikrobiologisches Inst., Zurich, Switzerland
- K78.** Analysis of Structure-Function Relationships in the NiFe-Hydrogenase from *Azotobacter vinelandii*: C-Terminal Processing during Maturation (260) D. J. GOLLIN,\* A. I. MENON, L. E. MORTENSON, and R. L. ROBSON, Univ. of Georgia, Athens.
- K79.** Monoclonal Antibodies to *Azotobacter vinelandii* Nitrogenase (262) L. L. KERBER,\* D. S. GONZALEZ, L. E. MORTENSON, and R. L. ROBSON, Univ. of Georgia, Athens.
- K80.** Temporal Appearance of Nitrogen-Fixing and Hydrogen-Producing Activities in Immobilized Synchronously Grown Cyanobacterial Colonies. (264) H. TAKEYAMA,\* C. CAMPBELL,\* M. KOMATSU, and A. MITSUI, Sch. of Marine and Atmospheric Sci., Univ. of Miami, Miami, Fla.
- K81.** Alternative Ammonium Assimilation Pathways in the Cyanobacterium *Agmenellum quadruplicatum* PR-6 (266) S. P. THOMAS\* and S. E. STEVENS, JR, Memphis State Univ., Memphis, Tenn.
- K82.** The Cytochrome *b*-Containing Nitrate Reductase of *Xanthomonas maltophilia*. (268) P. A. KETCHUM, Dept. Biol. Sci., Oakland Univ., Rochester, Mich.
- K83.** Purification and Initial Characterization of the Membrane-Bound (Cofactor-Independent) Sorbitol Dehydrogenase Cytochrome Complex from *Gluconobacter oxydans*. (270) I. J. VAN LARE\* and G. W. CLAUS, Virginia Polytechnic Inst. and State Univ., Blacksburg.
- K84.** Isolation and Characterization of Nitrite Reductase-Deficient Mutants of *Haemophilus parainfluenzae* by Introduction of Tn916. (272) J. NAU,\* F.-H. LEE, and H. C. DAVIES, Univ. of Pennsylvania, Philadelphia.
- K85.** Nitrate Reductase from *Geobacter metallireducens* GS-15 (274) J. F. STOLZ\* and R. R. NAIK, Dept. of Biol. Sci., Duquesne Univ., Pittsburgh, Pa.

## Session 166 (H). ENVIRONMENTAL SENSING: PRESSURE AND HEAT

- H188.** *osmY*, a New Hyperosmotically Induced Gene in *Escherichia coli*. (276) H. H. YIM\* and M. R. VILLAREJO, Univ. of California, Davis
- H189.** Genetic Mapping of the *ompR*- and *arcA*-Like *agmR* Gene of *Pseudomonas aeruginosa*. (278) V. D. SHORTRIDGE\* and H. P. SCHWEIZER,\* Dept. of Microbiol. and Immunology, Univ. of Colorado, Denver, and Dept. of Microbiol. and Infectious Diseases, Univ. of Calgary, Calgary, Alberta, Canada

- H190.** Signal Transduction in Alginate Synthesis. Phosphorylation of the Response Regulator AlgR1 and AlgR2. (280) S. ROYCHOUDHURY,\* K. SAKAI, and A. M. CHAKRABARTY. Univ. of Illinois Col. of Medicine, Chicago.
- H191.** *osmZ* Regulation of Expression of the pH-Induced Amino Acid Decarboxylases Encoded by *cadA* and *adi*. (282) X. SHI,\* B. WAASDORP, and G. N. BENNETT Rice Univ., Houston, Tex.
- H192.** Functional Analysis of Conserved Aspartic Acid Residues of OmpR, a Transcriptional Activator for *ompF* and *ompC* in *Escherichia coli*. (284) J. DELGADO\* and M. INOUE. Dept. of Biochemistry, Robert Wood Johnson Med. Sch.-Univ. of Med. and Dent. of New Jersey-Rutgers, Piscataway.
- H193.** Isolation and Characterization of KdpE, an Effector Protein That Couples Reduced Turgor Pressure to Expression of the *kdpABC* Operon of *Escherichia coli*. (286) L. BRANDON\* and W. EPSTEIN. Univ. of Chicago, Chicago, Ill.
- H194.** Regulation of *ompH* Gene Expression by Hydrostatic Pressure in a Deep-Sea *Photobacterium* spp., SS9. (288) E. CHI\* and D. H. BARTLETT. Scripps Inst. of Oceanography, Univ. of California-San Diego, La Jolla.
- H195.** Pressure Stress Response in *Escherichia coli*. (290) T. WELCH\* and D. H. BARTLETT. Scripps Inst. of Oceanography, Univ. of California-San Diego, La Jolla.
- H196.** Interaction of the Heat Shock Protein GroEL of *Escherichia coli* with Single-Stranded DNA-Binding Protein: Suppression of *ssb-113* by *groEL46*. (292) P. S. LAINE\* and R. R. MEYER. Dept. of Biol., Xavier Univ., Cincinnati, Ohio.
- H197.** *arc*-Dependent Heat-Shock Regulation and Extragenic Suppression of the *Escherichia coli* Cytochrome *d* Operon. (294) D. WALL\* and C. GEORGOPOULOS. Univ. of Utah Med. Ctr., Salt Lake City.
- H198.** Physical Association of the 70-kDa Heat Shock Protein (hsp70) with the Smith Autoantigens of the Small Nuclear Ribonucleoproteins. (296) S. A. TENENBAUM\* and R. F. GARRY. Tulane Univ. Sch. of Med., New Orleans, La.
- H199.** One-Carbon Metabolism and the Modulation of the Heat Shock Response in *Escherichia coli*. (298) D. J. GAGE\* and F. C. NEIDHARDT. Univ. of Michigan, Ann Arbor.
- H200.** Cloning and Characterization of the *groESL* Operon from *Bacillus subtilis*. (300) M. LI, X.-C. WU, and S.-L. WONG.\* Univ. of Calgary, Calgary, Alberta, Canada.

### Session 167

(Eligible for continuing education credit)

#### Eli Lilly Award Address

### VIRUS-RECEPTOR INTERACTION IN POLIOVIRUS ENTRY AND PATHOGENESIS

VINCENT R. RACANIELLO, Columbia Univ. Col. of Physicians and Surgeons, New York, N.Y.

Thursday, 4:45 P.M., Ballroom IB

### Session 168

(Eligible for continuing education credit)

### PRESIDENT'S FORUM

(Sponsored by the New Brunswick Scientific Company)

### BIOLOGICAL WARFARE: AN OLD PROBLEM AND FUTURE CONCERNS

Thursday, 8:00 P.M., Grand Ballroom, Sheraton New Orleans

DAVID L. HUXSOLL, Louisiana State Univ., Baton Rouge

MATTHEW S. MESELSON, Harvard University, Cambridge, Mass.

NANCY CONNELL, Albert Einstein Col. of Med., Bronx, N.Y.

Moderator: RICHARD L. CROWELL, Hahnemann Univ. Sch. of Med., Philadelphia, Pa.

The President's Reception follows immediately in the Pontchartrain Ballroom of the Sheraton New Orleans.

### Session 169 (L, Society of Hospital Epidemiology of America). Seminar

(Eligible for continuing education credit)

### PROTECTING WORKERS/PROTECTING PATIENTS: AN INFECTION CONTROL DILEMMA FOR THE 1990s

Friday, 8:30 A.M., Ballroom IA

Convenors: MICHAEL L. TAPPER, Lenox Hill Hosp., New York, N.Y., and FRANK S. RHAME, Univ. of Minnesota Hosp., Minneapolis

Introduction: an Overview of Infectious Risks to Health Care Workers in the 1990s

MICHAEL L. TAPPER, Lenox Hill Hosp., New York, N.Y.

Tuberculosis and the Health Care Worker  
DIXIE SNIDER, CDC, Atlanta, Ga.

Hepatitis and the Health Care Worker  
CRAIG SHAPIRO, CDC, Atlanta, Ga.

Human Immunodeficiency Virus and the Health Care Worker  
DAVID BELL, CDC, Atlanta, Ga.

The Role of the State Health Department  
DALE L. MORSE, New York State Dept. of Health, Albany

Legal Issues and Health Care Worker Risks  
MARK BARNES, New York Law Sch., New York, N.Y.

FRIDAY

**Session 170 (C). Seminar**  
(Eligible for continuing education credit)

**PITFALLS IN ANTIMICROBIAL  
SUSCEPTIBILITY TESTING**

Friday, 8:30 A.M., Ballroom IB

*Convenors:* STEPHEN G. JENKINS, Baptist Med. Ctr., Jacksonville, Fla., and MICHAEL SAUBOLLE, Good Samaritan Med. Ctr., Phoenix, Ariz.

The Actinomycetes and Rapidly Growing Mycobacteria  
MICHAEL SAUBOLLE, Good Samaritan Med. Ctr., Phoenix, Ariz.

The Streptococci, Enterococci, and Staphylococci  
DANIEL SAHM, Univ. of Chicago Med. Ctr., Chicago, Ill.

The Fastidious Microorganisms  
JAMES JORGENSEN, Univ. of Texas Health Sci. Ctr., San Antonio

The Anaerobes  
KENNETH ALDRIDGE, Louisiana State Univ. Med. Ctr., New Orleans

The Fungi  
MICHAEL RINALDI, Univ. of Texas Health Sci. Ctr., San Antonio

The Enterics and Other Gram-Negative Bacilli  
STEPHEN JENKINS, Baptist Med. Ctr., Jacksonville, Fla.

**Session 171 (F)**

**MYCOSES: EPIDEMIOLOGY, HOST  
RESPONSE, AND TREATMENT**

Friday, 8:30 A.M., Room 10

*Moderators:* RICHARD HAMILL, Baylor Univ. Med. Sch., Houston, Tex., and DAVID W. DENNING, Univ. of Manchester, Manchester, England

8:30

F69. Heterogeneity of *Pneumocystis* Isolates by Pulsed-Field Gradient Electrophoresis. M. T. CUSHION,\* M. KASELIS, and J. ZHANG. Univ. of Cincinnati Col. of Med., Cincinnati, Ohio.

F70. Electrophoretic Karyotypes of *Coccidioides immitis*. S. PAN\* and G. COLE. Univ. of Texas, Austin.

F71. Identification and Characterization of the Yeast *Kloeckera* in Human Stool Samples. M. LEE,\* L. SHERLIN, and B. CUPP. Great Smokies Diagnostic Lab., Asheville, N.C.

F72. Survival, Persistence, and Dissemination of *Trichosporon beigelii* from the Gastrointestinal Tract. M. J. KENNEDY,\* D. HOSPENTHAL, A. L. ROGERS, and R. J. YANCEY, JR. Upjohn Co., Kalamazoo, Mich.; Walter Reed Army Inst. of Res., Washington, D.C.; and Michigan State Univ., East Lansing.

9:30

F73. Diagnosis of Pneumonia Due to *Cryptococcus neoformans* in AIDS Patients. J. HANANEL, T. HULBERT,\* R. LARSEN, L. VASHON, P. CHANDRASOMA, and S. EVANS. Los Angeles County-USC Med. Ctr., Los Angeles, Calif.

F74. Prevalence of Human Serum Antibodies against a 33-kDa Antigen from *Coccidioides immitis* and Its Expression in Different Morphologic Forms of Fungal Growth. J. N. GALGANI,\* S. H. SUN, K. O. DUGGER, G. G. GRACE, J. HARRISON, and M. A. WIEDEN. VA Med. Ctr. and Univ. of Arizona, Tucson.

F75. Phagolysosomes Containing *Histoplasma capsulatum* Fail To Acidify Normally. L. G. EISSENBERG,\* B. GOLDMAN, and P. H. SCHLESINGER. Washington Univ. Sch. of Med., St. Louis, Mo.

F76. Phenotypic and Functional Characterization of Human Lymphocytes Activated by Interleukin-2 To Inhibit *Cryptococcus neoformans*. S. M. LEVITZ\* and M. P. DUPONT. Boston Univ. Sch. of Med., Boston, Mass.

10:30

F77. Disseminated Trichosporonosis: Novel Murine Model and Experimental and Clinical Therapy. E. ANAISSIE,\* A. GOKASLAN, R. HACHEM, and C. STEPHENS. Univ. of Texas M. D. Anderson Cancer Ctr., Houston. and Becton Dickinson France S.A., Meylan Cedex, France.

F78. Cilofungin Effectiveness in Murine *Aspergillus fumigatus* Infections Correlates with Its Inhibition of  $\beta(1,3)$ -Glucan Synthase but Not Its MIC. D. BEAULIEU, D. ZECKNER, J. TANG,\* R. S. GORDEE, and T. R. PARR, JR. Lilly Res. Lab., Eli Lilly and Co., Indianapolis, Ind.

F79. Strain Variation and In Vitro Susceptibility Patterns in AIDS Patients Receiving Fluconazole for Oral Candidiasis. M. A. PFALLER,\* J. RHINE-CHALBERG, S. W. REDDING, A. W. FOTHERGILL, and M. G. RINALDI. Oregon Health Sci. Univ., Portland, and Univ. of Texas Health Sci. Ctr., San Antonio.

F80. Fluconazole Has Distinct Pharmacokinetic Properties in Children with Neoplastic Diseases. J. W. LEE,\* N. L. SEIBEL, M. AMANTEA, P. WHITCOMB, P. A. PIZZO, and T. J. WALSH. Nat. Cancer Inst. and Clin. Ctr., Bethesda, Md., and Children's Nat. Med. Ctr., Washington, D.C.

**Session 172 (H). Seminar**

(Eligible for continuing education credit)

**TRANSCRIPTION ACTIVATION: ACTIVATOR-  
RNA POLYMERASE CONTACTS**

Friday, 8:30 A.M., Room 43

*Convenors:* RICHARD H. EBRIGHT, Rutgers Univ., New Brunswick, N.J., and THOMAS J. SILHAVY, Princeton Univ., Princeton, N.J.

Transcription Activation by CAP: Identification and Characterization of the Activation Surface  
RICHARD H. EBRIGHT, Rutgers Univ., New Brunswick, N.J.

Transcription Activation by CAP: Mapping of Contact Sites on Polymerase Subunits  
AKIRA ISHIHAMA, Nat. Inst. of Genetics, Shizuoka, Japan

Transcription Activation by CAP: Physical Studies of CAP-RNA Polymerase Interaction in Solution

TOMASZ HEYDUK, Univ. of Texas Med. Branch, Galveston

Transcription Activation by FNR: Identification and Characterization of the Activation Surface

STEVEN BUSBY, Univ. of Birmingham, Birmingham, U.K.

Transcription Activation by FNR: *rpoA* Mutations Affecting Transcription Control by FNR

CHARLES MILLER, Univ. of Illinois, Urbana

Transcription Activation by OmpR: Mutational Analysis of OmpR Structure and Function

MASAYORI INOUE, Univ. of Med. and Dent. of New Jersey, Piscataway

R6. Phylogeny of *Rickettsia tsutsugamushi* as Deduced from the Sequence of Its 16S rRNA Gene. G. DASCH\* and K. SWINSON. Naval Med. Res. Inst., Bethesda, Md.

R7. *Treponema denticola* (ex Brumpt 1925) sp. nov., nom. rev., Isolated from Periodontal Pockets. E. C. S. CHAN,\* R. SIBOO, T. KENG, N. PSARRA, R. HURLEY, S.-L. CHENG, and I. IUGOVAZ. McGill Univ., Montreal, Quebec, Canada.

R8. Population Genetic Analysis of *Borrelia burgdorferi* Isolates by Multilocus Enzyme Electrophoresis. P. BOERLIN, O. PETER, A. G. BRETZ, D. POSTIC, G. BARANTON, and J. C. PIFFARETTI.\* Istituto Cant. Batteriologico, Lugano, Switzerland; Inst. Central des Hôpitaux Valaisans, Sion, Switzerland; and Unité de Bactériol. Moléculaire et Méd., Inst. Pasteur, Paris, France.

## Session 173 (R)

### SYSTEMATICS AND MOLECULAR DIVERSITY OF PROKARYOTES

Friday, 8:30 A.M., Room 37

Moderators: DAVID STAHL, Univ. of Illinois, Urbana, and DAVID P. LABEDA, USDA, Agricultural Res. Service, Nat. Ctr. for Agricultural Utilization Res., Peoria, Ill.

#### 8:30 Divisional Lecture

(Eligible for continuing education credit)

Interrelationships of Genomic DNA and rRNA Similarity Values

JOHN L. JOHNSON, Virginia Polytechnic Inst., Blacksburg

9:30

R1. Proposal for a New Genus: *Alicyclobacillus* gen. nov., Based on 16S rRNA (rDNA) Phylogeny Analyses on the *Bacillus* Group IV Thermoacidophiles. P. JURTSCHUK, JR.,\* J. D. WISOTZKEY, G. E. FOX, G. DEINHARD, and K. PORALLA. Univ. of Houston, Houston, Tex., and Univ. of Tübingen, Tübingen, Germany.

R2. DNA Relatedness among Strains of the *Streptomyces lavendulae* Cluster. D. P. LABEDA. Microbial Properties Res., Nat. Ctr. for Agricultural Utilization Res., Agricultural Res. Service, USDA, Peoria, Ill.

R3. Phylogenetic Analysis of *Chroococcidiopsis* and Related Unicellular Genera of Cyanobacteria. R. H. REEVES, M. S. HUA, R. OCAMPO-FRIEDMANN, and E. I. FRIEDMANN.\* Florida State Univ. and Florida A&M Univ., Tallahassee.

R4. Characterization of a Sulfate-Reducing Bacterium Isolated from an Anaerobic 3-Chlorobenzoate-Dechlorinating Coculture. B. R. SHARAK GENTHNER,\* G. MUNDFROM, and R. DEVEREUX. Technical Resources, Inc., and U.S. EPA, Gulf Breeze, Fla.

10:30

R5. Characterization of an Etiologic Agent of Chronic Otitis Media by Fatty Acid Analysis, DNA-DNA Hybridization, and 16S rRNA Sequencing. G. BOSLEY,\* S. O'CONNOR, W. MOSS, M. DANESHVAR, and R. FACKLAM. CDC, Atlanta, Ga.

## Session 174 (K, I). Seminar

(Eligible for continuing education credit)

### IRON AND SULFUR CHEMOLITHOTROPHY

Friday, 8:30 A.M., Room 41

Convenors: JESSUP M. SHIVELY, Clemson Univ., Clemson, S.C., and ROBERT C. BLAKE II, Meharry Med. Col., Nashville, Tenn.

*Leptospirillum ferrooxidans* or *Thiobacillus ferrooxidans*: Who Contributes More to Microbial Metal Leaching?

W. SAND, Hamburg Univ., Hamburg, Germany

Enzymes of Respiratory Iron Oxidation

R. C. BLAKE II, Meharry Med. Col., Nashville, Tenn.

Microbial Diversity and Interactions in Iron-Rich Acidic Waters

D. B. JOHNSON, Univ. of Wales, Bangor, United Kingdom

Aerobic and Anaerobic Metabolism of Formic Acid by *Thiobacillus ferrooxidans*

J. T. PRONK, J. P. VAN DIJKEN, P. BOS, and J. G. KUENEN, Delft Univ. of Technology, Delft, The Netherlands

Oxidation of Elemental Sulfur by *Thiobacillus ferrooxidans*

S. C. LORBACH and J. M. SHIVELY, Clemson Univ., Clemson, S.C.

Metabolism of Soluble Sulfur Compounds by *Thiobacillus acidophilus*

R. MEULENBERG, J. T. PRONK, W. HAZEU, P. BOS, and J. G. KUENEN, Delft Univ. of Technology, Delft, The Netherlands

**Session 175 (C). Round Table**  
(Eligible for continuing education credit)

**UPDATE ON THE IMPLEMENTATION OF  
THE 1988 CLINICAL LABORATORY  
IMPROVEMENT ACT AMENDMENTS**

Friday, 8:30 A.M., Room 26

Convenors: JAMES W. SMITH, Indiana Univ. Med. Ctr., Indianapolis, and JOHN P. SMITH, HCA Wesley Med. Ctr., Wichita, Kans.

The implementation of the regulations of the 1988 amendments to the Clinical Laboratory Improvement Act (CLIA '88) will affect all clinical laboratories. The proposed regulations published in 1990 resulted in greater than 50,000 comments and the shifting of responsibility for developing revised regulations from the Health Care Financing Administration to the Centers for Disease Control. The revised regulations will address personnel standards, proficiency testing, and levels of clinical microbiology testing. This session will review what is anticipated to be final published regulations. The final regulations represent the total effort on the part of the federal agencies to respond to the greater than 50,000 comments. The content, interpretation, and implementation of the revised regulations will be presented.

**Session 176 (BET). Seminar**  
(Eligible for continuing education credit)

**INCORPORATING VIROLOGY INTO THE  
UNDERGRADUATE MICROBIOLOGY  
CURRICULUM**

Friday, 8:30 A.M., Room 103

Convenors: JANICE MATTHEWS-GREER, Centenary Col. of Louisiana, Shreveport, and TOM BRAWNER, Carthage Col., Kenosha, Wis.

**Bacteriophages**

HARRY HOLLOWAY, Univ. of North Dakota, Grand Forks

**Plant Viruses**

EDWARD NELSON and WILLIAM BOND, Univ. of Southeastern Louisiana, Hammond

**Cell Culture**

TOM BRAWNER, Carthage Col., Kenosha, Wis.

**Animal Viruses**

DON DOWNER, Mississippi State Univ., Mississippi State

**Animal Viruses**

RICHARD JAMISON, Louisiana State Univ. Med. Ctr., Shreveport

**Introduction**

RUTH RUSSELL, California State Univ., Long Beach

**Session 177 (D)**

**ORAL COLONIZATION AND CARIOGENIC  
ACTIVITIES OF STREPTOCOCCI AND OTHER  
MICROORGANISMS**

Friday, 8:30 A.M., Room 13

Moderators: A. S. BLEIWEIS, Univ. of Florida, Gainesville, and JACK LONDON, Nat. Inst. of Dent. Res., Bethesda, Md.

8:30

**D107.** Isolation of *Streptococcus gordonii* DL1 Coaggregation-Defective Mutants by Transposon Tn916 Mutagenesis. D. L. CLEMANS and P. E. KOLENBRANDER.\* NIH, Bethesda, Md.

**D108.** Allelic Replacement of *fimA* Results in Decreased Adhesion of *Streptococcus sanguis* FW213 to Hydroxyapatite. J. C. FENNO\* and P. FIVES-TAYLOR. Univ. of Vermont, Burlington.

**D109.** Genetic Analysis of Cell Surface Adhesins of *Streptococcus gordonii*. C. J. WHITTAKER,\* P. S. HANDLEY, and A. E. JACOB. Univ. of Manchester, Manchester, U.K.

**D110.** Characterization of a Unique Fluoride-Resistant Mutant of *Streptococcus mutans*. J. M. HIGH,\* C. C. BOYLES, and M. C. HUDSON. Univ. of North Carolina, Charlotte.

9:30

**D111.** Characterization of a Glycogen Gene Locus Which Contributes to *Streptococcus mutans* Virulence. G. SPATAFORA HARRIS. Univ. of Alabama, Birmingham.

**D112.** Generation of Internal Nested Deletions in the *spaP* Gene Encoding the P1 (I/II) Major Surface Adhesin of *Streptococcus mutans*. P. C. F. OYSTON,\* L. J. BRADY, and A. S. BLEIWEIS. Dept. of Oral Biol., Univ. of Florida, Gainesville.

**D113.** Allelic Exchange Mutagenesis of *spaP* from *Streptococcus mutans* and Characterization of the P1 Mutant. P. J. CROWLEY, L. J. BRADY, D. A. PIACENTINI, and A. S. BLEIWEIS.\* Univ. of Florida, Gainesville.

**D114.** Cloning of Polymerase Chain Reaction-Derived Regions of *spaP* from *Streptococcus mutans* for Expression and Purification of Truncated P1(I/II) Polypeptides. P. J. CROWLEY\* and A. S. BLEIWEIS. Dept. of Oral Biol., Univ. of Florida, Gainesville.

10:30

**D115.** Molecular Cloning and Sequencing of *scrA* and *scrB* from *Streptococcus sobrinus* 6715. Y. M. CHEN\* and D. J. LEBLANC. Univ. of Texas Health Sci. Ctr., San Antonio.

**D116.** Studies on the Function of Dextranase Inhibitor from *Streptococcus sobrinus*. J. W. SUN\* and S. Y. WANDA. Washington Univ., St. Louis, Mo.

**D117.** Nucleotide Sequence Analysis of the Region Upstream of the *Actinomyces viscosus* T14V Type 1 Fimbrial Subunit Gene. M. K. YEUNG. Univ. of Texas Health Sci. Ctr., San Antonio.

**D118.** Translation of a *Prevotella loescheii* Gene Encoding a Lectinlike Adhesin Requires a +1 Frameshift. J. MANCHITRON,\* J. ALLEN, M. MOOS, JR., and J. LONDON. Nat. Inst. of Dent. Res. and CBIR, Bethesda, Md.

11:30

**D119.** Directed Mutagenesis of *Streptococcus mutans wapa* Gene: Construction and Influence on Sucrose-Dependent

Adherence. H. QIAN and M. L. DAO.\* Dept. of Biol., Univ. of South Florida, and Inst. for Biomolecular Sci., Tampa.

**Session 178 (E, V). Seminar**  
(Eligible for continuing education credit)

**CYTOKINES AND INFECTIOUS DISEASES**

(Supported by DNAX Research Institute of Molecular and Cellular Biology)

Friday, 8:30 A.M., Room 2

Convenors: TOBY K. EISENSTEIN, Temple Univ. Sch. of Med., Philadelphia, Pa., and HERMAN FRIEDMAN, Univ. of South Florida, Tampa

Role in Inflammation of Members of a Novel Intercrine Family of Chemotactic Cytokines

JOOST J. OPPENHEIM, Frederick Cancer Res. and Development Ctr., Frederick, Md.

Cytokines, Macrophages, and Intracellular Parasites

CAROL A. NACY, Walter Reed Army Inst. of Res., Rockville, Md.

Cytokines, Natural Killer Cells, and Fungal Infections

JULIE Y. DJEU Univ. of South Florida, Tampa

Effects of Cytokines on *Salmonella typhimurium* Infection in Mice

PHILIP J. MORRISEY, Immunex, Seattle, Wash.

Role of Interleukins in Retrovirus Infections in Animals

MAURO BENDINELLI, Univ. of Pisa, Pisa, Italy

**Session 179 (V). Round Table**  
(Eligible for continuing education credit)

**CASE PRESENTATIONS IN CLINICAL AND DIAGNOSTIC IMMUNOLOGY**

Friday, 8:30 A.M., Room 5

Convenors: RONALD J. HARBECK, Nat. Jewish Ctr. for Immunology and Respiratory Med., Denver, Colo., and IRENE CHECK, Emory Univ. Sch. of Med., Atlanta, Ga.

The panelists will present a series of cases in which there were unusual or unexpected laboratory findings, or in which patients presented with recurrent or unusual infections. The cases to be covered will include those in which the assessment of humoral and cellular immunocompetence led to the diagnosis. Emphasis will be placed on the appropriate use of diagnostic immunology strategies and will focus on the current methods available for the evaluation of these patients. The format of the round table will encourage the audience to participate in the discussion and to ask questions. The cases presented will provide practical, take-home lessons for those in attendance.

Participants: RONALD J. HARBECK, IRENE CHECK, SU-ANNA CUNNINGHAM-RUNDLES, and DAVID NORMANSELL

**Session 180 (F). Seminar**  
(Eligible for continuing education credit)

**MOLECULAR CHARACTERIZATION OF VIRULENCE FACTORS IN PATHOGENIC FUNGI**

Friday, 8:30 A.M., Room 21

Convenors: FRANK ODDS, Janssen Res. Fndn., Beerse, Belgium, and RICHARD A. CALDERONE, Georgetown Univ., Washington, D.C.

Phenoloxidase of *Cryptococcus neoformans*

PETER WILLIAMSON, Nat. Inst. of Allergy and Infectious Diseases, Bethesda, Md.

Aspartic Proteinase: a Virulence Factor of *Candida albicans*

THOMAS L. RAY, Univ. of Iowa Hosp. and Clin., Iowa City

Elastase Contributes to Virulence of *Aspergillus flavus*

JUDITH RHODES, Univ. of Cincinnati, Cincinnati, Ohio

Is the 18-kDa Antigen a Virulence Factor for *Aspergillus fumigatus*?

JEAN-PAUL LATGE, Inst. Pasteur, Paris, France

Adhesins of *Candida albicans*

RICHARD A. CALDERONE, Georgetown Univ., Washington, D.C.

**Session 181 (B)**

**BACTERIAL INVASION OF HOST CELLS**

Friday, 8:30 A.M., Room 27

Moderators: THOMAS H. KAWULA, Cornell Univ., Ithaca, N.Y., and VIRGINIA MILLER, UCLA, Los Angeles, Calif.

8:30 Divisional Lecture

(Eligible for continuing education credit)

Bacterial Entry and Growth in Mammalian Cells

RALPH ISBERG, Tufts Univ., Boston, Mass.

9:30

**B216.** Altered Synthetic Response of *Campylobacter jejuni* to Cocultivation with Human Epithelial Cells Promotes Internalization. M. E. KONKEL\* and W. CIEPLAK, JR. Lab. of Vectors and Pathogens, Nat. Inst. of Allergy and Infectious Diseases, Rocky Mountain Lab., Hamilton, Mont.

**B217.** *Proteus mirabilis* Invasion of Human Renal Proximal Tubular Epithelial Cells. G. R. CHIPPENDALE,\* A. I. TRIFILLIS, and J. W. WARREN. Univ. of Maryland Sch. of Med., Baltimore.

**B218.** Novel Bacterial Invasion Mechanism That Is Microfilament Independent and Requires Coated-Pit Formation. T. A. OELSCHLAEGER,\* P. GUERRY, and D. J. KOPECKO



Walter Reed Army Inst. of Res., Washington, D.C., and Naval Med. Res. Inst., Bethesda, Md.

- B219.** *Citrobacter freundii* Uses Microfilament-Dependent and Independent Pathways To Invade Human Epithelial Cells. T. A. OELSCHLAEGER\* and D. J. KOPECKO. Walter Reed Army Inst. of Res., Washington, D.C.

10:30

- B220.** Investigation of the Ability of *Vibrio vulnificus* To Invade HEP-2 Cells. C. C. ELKIND, S. K. PATEL, and R. M. GANDER.\* Univ. of Texas Southwestern Med. Ctr., Dallas.
- B221.** Uptake of Pathogenic and Potentially Pathogenic Intestinal Bacteria by Cultured Enterocytes. R. P. JECHOREK\* and C. L. WELLS. Univ. of Minnesota, Minneapolis.
- B222.** Invasion of Rainbow Trout Gonad and Kidney Cells by *Yersinia ruckeri*. T. H. KAWULA\* and D. J. WATTENDORF. Cornell Univ., Ithaca, N.Y.
- B223.** Pathogenicity of Invasion-Defective *Yersinia enterocolitica*. J. C. PEPE\* and V. L. MILLER. UCLA, Los Angeles, Calif.

11:30

- B224.** Analysis of the In Vitro and In Vivo Phenotypes of an *ail* Mutant in *Yersinia enterocolitica*. M. R. WACHTEL\* and V. L. MILLER. UCLA, Los Angeles, Calif.
- B225.** Invasion of Respiratory Epithelium by *Pseudomonas cepacia*. J. L. BURNS,\* C. D. WADSWORTH, E. CHI, and M. JONAS. Children's Hosp. and Med. Ctr. and Univ. of Washington, Seattle.

**Session 182 (A). Seminar**  
(Eligible for continuing education credit)

**NONQUINOLONE INHIBITORS OF DNA  
GYRASE**

(Dedicated to John S. Wolfson)

Friday, 8:30 A.M., Room 16

*Convenors:* JOYCE SUTCLIFFE, Pfizer Central Res., Groton, Conn., and STEVE GRACHECK, Parke-Davis Pharmaceutical, Ann Arbor, Mich.

DNA Gyrase: Structure, ATP Hydrolysis, and Interaction with Coumarin Drugs  
ANTHONY MAXWELL, Univ. of Leicester, Leicester, England

Drug Interactions with DNA Gyrase from Different Bacterial Species  
KEITH BARRETT-BEE, ICI Pharmaceuticals, Macclesfield, United Kingdom

Strategies for the Detection of Gyrase Inhibitors from Natural Sources  
DAVID KNOWLES, MARTIN BURNHAM, JUDITH WARD, ESME HAYES, and JOHN HODGSON, Smith-Kline Beecham, Surrey, United Kingdom

Isolation and Characterization of a Novel Gyrase Inhibitor from Natural Sources  
PRABHA FERNANDES, Bristol-Myers/Squibb, Princeton, N.J.

Interaction of Structurally Novel Inhibitors with DNA Gyrase  
JOYCE SUTCLIFFE, Pfizer Central Res., Groton, Conn

**Session 183 (O). Seminar**  
(Eligible for continuing education credit)

**ANTIBODY ENGINEERING IN MICROBES**

Friday, 8:30 A.M., Room 85

*Convenors:* DAVID FILPULA, ENZON, Inc., Gaithersburg, Md., and DAVID J. FITZGERALD, Nat. Cancer Inst., Bethesda, Md.

Production and Uses of Single-Chain Antigen-Binding Proteins from *Escherichia coli*  
DAVID FILPULA, ENZON, Inc., Gaithersburg, Md

Expression and Scale-Up of Engineered Antibody Fragments  
MARC BETTER, XOMA Corp., Santa Monica, Calif.

Combinatorial Antibody Libraries on the Surface of Phage: Opportunities in Therapy and Antibody Engineering  
CARLOS F. BARBAS III, Scripps Res. Inst., La Jolla, Calif.

Single-Chain Immunotoxins made in *Escherichia coli* for Treatment of Human Diseases  
DAVID J. FITZGERALD, Nat. Cancer Inst., Bethesda, Md

In Vivo Catalysis of Metabolically Essential Reactions by Catalytic Antibodies  
DONALD HILVERT, Scripps Res. Inst., La Jolla, Calif

**Session 184. Divisional Group IV  
Symposium**

(Eligible for continuing education credit)

**CELLULAR RECEPTORS FOR ANIMAL  
VIRUSES**

Friday, 8:30 A.M., Room 93

*Convenors:* KATHRYN V. HOLMES, Uniformed Services Univ. of the Health Sci., Bethesda, Md., and JAMES STRAUSS, California Inst. of Technology, Pasadena

How Many Cell Surface Receptors Does Herpes Simplex Virus Need?  
PAT SPEAR, Northwestern Univ. Med. and Dent. Sch., Chicago, Ill.

Coronavirus Receptors  
KATHRYN V. HOLMES, Uniformed Services Univ. of the Health Sci., Bethesda, Md.

Cellular Receptors for Sindbis Virus  
JAMES H. STRAUSS, California Inst. of Technology, Pasadena

Receptors for Murine Retroviruses  
JAMES M. CUNNINGHAM, Harvard Med. Sch., Boston, Mass.

## Session 185 (E)

### NEW DEVELOPMENTS IN VACCINES: VEHICLES FOR EFFECTIVE ANTIGEN DELIVERY

Friday, 8:30 A.M., Room 1

*Moderators:* PAUL A. GULIG, Univ. of Florida Col. of Med., Gainesville, and ROY CURTISS III, Washington Univ., St. Louis, Mo.

8:30

- E82.** Induction of Cell-Mediated Immune Response Using a Chimeric Flagellin Vaccine. N. K. VERMA,\* H. K. ZIEGLER, B. A. D. STOCKER, and G. K. SCHOOLNIK. Stanford Univ. Sch. of Med., Stanford, Calif., and Emory Univ., Atlanta, Ga.
- E83.** *Salmonella* as a Vaccine Vector: Controlled De Novo Expression of Antigen in Mice for Immunization with Toxic Proteins. S. E. ERVIN,\* P. A. SMALL, JR., and P. A. GULIG. Univ. of Florida Col. of Med., Gainesville.
- E84.** Avirulent *Salmonella typhimurium* and *Salmonella typhi* Expressing Hybrid Hepatitis B Virus Core/Pre-S Genes for Oral Vaccination. F. SCHODEL,\* S. M. KELLY, H. WILL, and R. CURTISS III. Max-Planck-Inst. für Biochemie, Martinsried, Germany, and Dept. of Biol., Washington Univ., St. Louis, Mo.
- E85.** In Vitro Responses to *Escherichia coli* Heat-Labile Enterotoxin (LT-B) and LT-B-Dextranase Fusion Proteins Expressed by a *Salmonella typhimurium* Vaccine Strain. T. A. DOGGETT,\* E. K. JAGUSTZYN-KRYNICKA, S. M. KELLY, and R. CURTISS III. Washington Univ., St. Louis, Mo.

9:30

- E86.** Expression of *Plasmodium falciparum* Erythrocyte-Binding Antigen Peptide 4 in Salmonellae. F. A. RUBIN,\* B. K. L. SIM, L. E. LINDLER, F. KOSTER, B. FRAIN, and R. L. WARREN. Walter Reed Army Inst. of Res., Washington, D.C., and Univ. of New Mexico, Albuquerque.
- E87.** Immunogenicity of Outer Membrane Protein P2 of *Haemophilus influenzae* in Mice after Oral Immunization with an Attenuated Mutant of *Salmonella typhimurium* Expressing P2. J. BELL,\* T. DOGGETT, and R. S. MUNSON, JR. Washington Univ., St. Louis, Mo.
- E88.** Heterologous Antigen Expression on the Surface of *Streptococcus gordonii*. G. POZZI,\* M. CONTORNI, M. R. OGGIONI, R. MANGANELLI, M. TOMMASINO, F. CAVALIERI, and V. A. FISCHETTI. Univ. of Siena and Sclavo Res. Ctr., Siena, Italy, and Rockefeller Univ., New York, N.Y.
- E89.** Lactobacilli as a Vehicle for Antigen Delivery to the Genital Tract. C. RUSH,\* L. HAFNER, and P. TIMMS. Ctr. for Molecular Biotechnology, Queensland Univ. of Technology, Brisbane, Australia.

10:30

- E90.** Oral Immunization of Rats with Influenza Virus M Protein (M1) Microspheres. N. SANTIAGO,\* S. MILSTEIN, T. RIVERA, E. GARCIA, T. C. CHANG, and D. BUCHER. Clin. Technologies Assoc., Inc., Elmsford, N.Y., and New York Med. Col., Valhalla.
- E91.** Immunogenicity of Enterotoxigenic *Escherichia coli* Colonization Factor Antigens (CFA/II) Encapsulated in Biode-

gradable Polymer Microspheres. E. BOEDEKER,\* R. REID, C. MCQUEEN, Y.-L. TSENG, H. BHAGAT, R. NELLORE, C. TACKETT, and R. EDELMAN. Walter Reed Army Inst. of Res., Washington, D.C., and Univ. of Maryland, Baltimore

## Session 186 (U). Seminar

(Eligible for continuing education credit)

### LEPROSY RESEARCH: PRESENT AND FUTURE

Friday, 8:30 A.M., Room 80

*Convenors:* PATRICK J. BRENNAN, Colorado State Univ., Fort Collins, and JOSEPHINE E. CLARK-CURTISS, Washington Univ., St. Louis, Mo.

#### Identification and Characterization of Antigens

CRISTINA PESSOLANI, Colorado State Univ., Fort Collins

#### Diagnosis and Epidemiology

THOMAS P. GILLIS, Nat. Hansen's Disease Ctr., Carville, La.

#### Animal Models

PAUL CONVERSE, Johns Hopkins Univ., Baltimore, Md.

#### Cell-Mediated Immunity

ROBERT L. MODLIN, UCLA Sch. of Med., Los Angeles, Calif.

#### Studies on Pathogenesis

JOSEPHINE E. CLARK-CURTISS, Washington Univ., St. Louis, Mo.

## Session 187 (B). Seminar

(Eligible for continuing education credit)

### MOLECULAR BIOLOGY OF UROPATHOGENS

Friday, 8:30 A.M., Room 19

*Convenors:* HARRY L. T. MOBLEY, Univ. of Maryland Sch. of Med., Baltimore, and JAMES R. JOHNSON, Univ. of Minnesota Med. Sch., Minneapolis

#### Virulence Determinants of Uropathogenic *Escherichia coli*

JAMES R. JOHNSON, Univ. of Minnesota Med. Sch., Minneapolis

#### Hemolysins of *Escherichia coli* and *Proteus*

WILLIAM D. THOMAS, JR., Univ. of Wisconsin Sch. of Med., Madison

#### Chaperone-Assisted Assembly and Molecular Architecture of Adhesive Pili

SCOTT HULTGREN, Washington Univ. Sch. of Med., St. Louis, Mo.

#### Virulence Determinants of *Proteus*

HARRY L. T. MOBLEY, Univ. of Maryland Sch. of Med., Baltimore

Genetic Analysis of *Proteus mirabilis* Swarmer Cell Differentiation

M. ROBERT BELAS, Ctr. of Marine Biotechnology and Univ. of Maryland, Baltimore

Virulence Determinants of *Klebsiella pneumoniae*

CARLEEN M. COLLINS, Univ. of Miami Sch. of Med., Miami, Fla.

### Session 188 (O)

## BIOTRANSFORMATIONS AND BIOCONVERSIONS

Friday, 8:30 A.M., Room 33

*Moderators:* JEFFREY S. KARNS, USDA, Beltsville, Md., and JOANNE M. HORN, Ctr. for Environmental Diagnostics & Bioremediation, Pensacola, Fla.

8:30

O49. Aerobic and Anaerobic Degradation of Atrazine by Surface and Subsurface Microbial Consortia. M. RADOSEVICH,\* O. H. TUOVINEN, and S. J. TRAINA. Ohio State Univ., Columbus.

O50. EPTC-Degrading *Rhodococci* sp. Isolates TE1 and B30 Degrade the Herbicide Atrazine. R. BEHKI, E. TOPP,\* and W. A. DICK. CLBRR, Agriculture Canada, CEF Ottawa, Ontario, Canada, and Ohio Agricultural Res. and Development Ctr., Ohio State Univ., Wooster.

O51. *N*-Deisopropylation and *N*-Deethylation of Atrazine by a Streptomycete. B. M. POGELL. Ctr. for Agriculture and Biotechnology, Univ. of Maryland, College Park, and PDL, USDA, Beltsville, Md.

O52. Purification and Characterization of Cyanuric Acid Amidohydrolase, the Enzyme Responsible for Cleavage of the *s*-Triazine Ring. J. S. KARNS. Pesticide Degradation Lab., Nat. Resources Inst., USDA, Agricultural Res. Service, Beltsville, Md.

9:30

O53. Isolation of a Gamma-Lindane-Degrading Microorganism. D. B. RIVERS\* and L. A. DECKARD. Southern Res. Inst., Birmingham, Ala.

O54. Metabolism of Methyl-Substituted Arenes by *Alcaligenes eutrophus* JMP 134. D. H. PIEPER,\* J. EGESTORFF, K. N. TIMMIS, and H.-J. KNACKMUSS. Natl. Res. Ctr. for Biotechnology, Braunschweig, Germany, and Univ. of Stuttgart, Stuttgart, Germany.

O55. Constitutive Overexpression of Mercury Resistance for the Biotransformation of Mercury-Containing Wastes. M. BRUNKE, K. N. TIMMIS, W.-D. DECKWER, and J. M. HORN.\* Univ. of West Florida, Pensacola, and Nat. Res. Ctr. for Biotechnology, Braunschweig, Germany.

O56. Introduction of Arsenic Resistance Genes into *Acidiphilium facilis*. D. F. BRUHN,\* F. F. ROBERTO, and T. E. WARD. Idaho Nat. Engineering Lab., Idaho Falls.

10:30

O57. Origin of Enzymatic Activities Responsible for Detoxication and Roots Softening in Retting, a Cassava Lactic

Fermentation. A. BRAUMAN\* and F. AMPE. ORSTOM, Brazzaville, Congo.

O58. Bioconversion of Peat to Reducing Sugars by a Multienzyme System of *Trichoderma harzianum* FP108 and *Trichoderma reesei* QM9414. Z.-Y. GU\* and F. H. CHANG. Bemidji State Univ., Bemidji, Minn.

O59. Anaerobic Bioconversion of Tuna Processing Wastes. N. J. NAGLE\* and C. J. RIVARD. Biotechnology Res. Branch, Fuels and Chemicals Res. and Engineering Div., Nat. Renewable Energy Lab., Golden, Colo.

O60. Modification of Macromolecular Coal by *Phanerochaete chrysosporium*. J. K. POLMAN,\* K. M. DELEZENE-BRIGGS, and C. R. BRECKENRIDGE. INEL, EG&G Idaho, Inc., Idaho Falls.

### Session 189 (BET). Round Table

(Eligible for continuing education credit)

## SCIENCE LITERACY: A FABLE FOR OUR TIME

Friday, 8:30 A.M., Room 95

*Convenors:* NORMAN P. WILLETT, Temple Univ. Sch. of Med., Philadelphia, Pa., and FRANK X. BIONDO, Long Island Univ./C.W. Post Col., Brookville, N.Y.

The crisis over science literacy in this country has reached epidemic proportions. It stretches from the public through all levels of our educational hierarchy, affecting student and teacher alike, and even manifests itself in the research community. The explanations for this crisis and the issues involved are manifold. Even the definition of science literacy becomes a function of the particular vantage point and the constituency attempting to extract the meaning of the term. One is reminded of the fable concerning the blind men and the elephant, in which each individual, touching only a small section of the animal, attempted to explain its characteristics only in the terms of his immediate perspective. The objective of this session will focus on scientific literacy with a microbiological emphasis, bringing together different constituencies. Representatives of the research community, pre-college educators, the public realm, and professional societies will discuss their concepts of science literacy, its importance, and the role each group can take in implementation. Participants will form a panel at the completion of their talks to respond to questions and comments from the audience. We will attempt to define key issues which must be addressed to see the "entire beast."

*Participants:* F. BIONDO, D. SCOTT, J. SPITZNAGEL, N. WILLETT, and S. ZABLOTNEY

**Session 190 (Professional Affairs Committee, PSAB; AAM). Round Table**  
(Eligible for continuing education credit)

**THE REGULATORY AND LEGISLATIVE PERSPECTIVE FOR CLINICAL MICROBIOLOGISTS: STATENET—WHAT IS IT? HOW DO I GET INVOLVED?**

New Time: Friday, 1:30 P.M., Room 20

*Convenors:* JACK DEBOY, American Academy of Microbiology and State of Maryland Lab. Administration, Baltimore, and ALICE WEISSFELD, Public and Scientific Affairs Board and Microbiology Specialists Inc., Houston, Tex.

STATENET is a program of the Public and Scientific Affairs Board that tracks and monitors legislation and regulations relating to clinical microbiology in all 50 states. Approximately 200 ASM members have volunteered to be key contacts in 44 states. These key contacts are becoming involved in legislation and regulations pertaining to clinical microbiology. The program utilizes the expertise of ASM members to provide analysis of certain legislation or regulations if necessary. ASM Headquarters coordinates the program and offers advice on legislative or regulatory strategy if requested. This round table will seek to inform current key contacts and any potentially interested key contacts about the legislative and regulatory process, how it works, how to become involved in the process, and the positive impact participation in the program can have on the profession of microbiology. The members of the round table will focus on the procedures necessary for individuals or branches to become involved with legislative and regulatory state issues and will share their first-hand experiences with the program. The meeting will be open for discussion and comments from the audience.

*Participants:* J. DEBOY, L. GARCIA, A. MELNICK, H. POLLOCK, and A. WEISSFELD

**Session 191 (Q). Seminar**  
(Eligible for continuing education credit)

**USE OF POLYMERASE CHAIN REACTION FOR ENVIRONMENTAL MONITORING**

Friday, 8:30 A.M., Room 82

*Convenors:* BETTY H. OLSON, Univ. of California, Irvine, and JOSEPH L. DICESARE, Perkin Elmer Cetus, Norwalk, Conn.

An Overview of Polymerase Chain Reaction for Environmental Analysis

JOSEPH L. DICESARE, Perkin Elmer Cetus, Norwalk, Conn.

Polymerase Chain Reaction Technology in the Tenth Year  
JON RAYMOND, Cetus Corp., Emeryville, Calif.

Use of Polymerase Chain Reaction for Detection of *Legionella* in Environmental Samples

SHAWN MCCARTHY and RONALD M. ATLAS, Louisville Water Co. and Univ. of Louisville, Louisville, Ky.

Future Applications of Polymerase Chain Reaction in Environmental Testing

RONALD M. ATLAS, Univ. of Louisville, Louisville, Ky.

Polymerase Chain Reaction Technology for Detection of Enteric Viruses in Environmental Samples

RICARDO DELEON, Univ. of North Carolina, Chapel Hill

**Session 192 (P). Seminar**  
(Eligible for continuing education credit)

**DETECTION OF PATHOGENS BY CONDUCTANCE MICROBIOLOGY**

Friday, 8:30 A.M., Room 87

*Convenors:* NORMAN STERN, USDA, Agricultural Res. Service, Russell Agricultural Res. Ctr., Athens, Ga., and PHILIP COOMBS, Radiometer America, Inc., Westlake, Ohio

*Salmonella*

FRAN MARLATT, Radiometer America, Inc., Westlake, Ohio

*Listeria in Food*

ERIC BOLTON, Malthus Instruments Ltd., Crawley, U.K.

*Listeria in the Environment*

MICHAEL CIRIGLIANO, T. J. Lipton Co., Englewood Cliffs, N.J.

*Campylobacter*

NORMAN STERN and ERIC BOLTON, USDA, Agricultural Res. Service, Athens, Ga., and Malthus Instruments Ltd., Crawley, U.K.

Regulatory Approvals: Update

PHILIP COOMBS, Radiometer America, Inc., Westlake, Ohio

**Session 193 (M). Seminar**  
(Eligible for continuing education credit)

**CAPSID ASSEMBLY AND PACKAGING IN BACTERIOPHAGES**

Friday, 8:30 A.M., Room 38

*Convenors:* ROGER W. HENDRIX, Univ. of Pittsburgh, Pittsburgh, Pa., and SHERWOOD R. CASJENS, Univ. of Utah Med. Ctr., Salt Lake City

Bacteriophage P22: Capsid Structure and Assembly Mechanism  
PETER PREVELIGE, MIT, Cambridge, Mass.

DNA Packaging by Phage P22

SHERWOOD CASJENS, Univ. of Utah, Salt Lake City

Packaging of Foreign Molecules into Phage Capsids

LINDSAY BLACK, Univ. of Maryland, Baltimore

Studies on the Mechanism of Phage  $\phi$ 29 DNA-gp3 Packaging

DWIGHT ANDERSON, Univ. of Minnesota, Minneapolis

FRIDAY

## POSTER SESSIONS

Friday, 9:00-10:30 A.M., Exhibit Hall C

(Board numbers in parentheses)

### Session 194 (Q). MICROBIAL DETECTION METHODOLOGY

- Q214.** Rapid Assessment of Genotoxic Contaminants from Freshwater Sediments. (001) B. T. JOHNSON. National Fisheries Contaminant Res. Ctr., FWS, U.S. Dept. of the Interior, Columbia, Mo.
- Q215.** New Method for Rapidly Determining Microbiological Utilization of Volatile Contaminants. (003) J. M. STRONG-GUNDERSON,\* A. V. PALUMBO, and S. O. SCARBOROUGH. Environmental Sci. Div., Oak Ridge Nat. Lab., Oak Ridge, Tenn.
- Q216.** Identification of Genes Capable of Biodegrading Toluene in Several Microorganisms. (005) M. A. KESON\* and S. K. DUTTA. Howard Univ., Washington, D.C.
- Q217.** Fast Nonradioactive Method for Enumeration of TOL Plasmid-Containing Bacteria in Gasoline-Contaminated Aquifer. (007) K. G. KORTLI\* and B. B. HEMMINGSEN. Dept. of Biol., San Diego State Univ., San Diego, Calif.
- Q218.** Molecular Environmental Diagnostics in Contaminated Subsurface Sites. (009) L. JIMINEZ,\* I. ROSARIO, C. WERNER, S. KOH, and G. S. SAYLER. Ctr. for Environmental Biotechnology, Univ. of Tennessee, Knoxville.
- Q219.** Identification of Aeromonads by Using Polyclonal Antisera Raised against Outer Membrane Proteins. (011) D. P. FOLEY,\* D. J. MCGAREY, and D. V. LIM. Univ. of South Florida, Tampa.
- Q220.** Identification of *Edwardsiella tarda* by Fatty Acid Composition. (013) W. L. LANDRY,\* C. N. RODERICK, and M. V. GIPSON. U.S. FDA, Dallas, Tex.
- Q221.** Beta-Hemolytic Streptococcal Pharyngeal Carriers among Children at the UAE and Evaluation of Two Rapid Detection Tests. (015) E. S. HASSAN. UAE Univ., Al-Ain, United Arab Emirates.
- Q222.** Phage Typing Scheme for *Bacillus cereus*. (017) R. AHMED,\* P. SANKAR-MISTRY, S. JACKSON, H. W. ACKERMANN, and S. KASATIYA. Ottawa and Hamilton Publ. Health Lab., Ontario Ministry of Health, Ontario, Canada; Laval Univ., Quebec, Quebec, Canada; and Univ. of Ottawa, Ottawa, Ontario, Canada.
- Q223.** Reactions of *Bdellovibrio* Isolates in Miniature Rapid Test Systems. (019) D. L. GUETHER\* and H. N. WILLIAMS. Dept. of Microbiol., Univ. of Maryland Dent. Sch., Baltimore.
- Q224.** Aquatic Microbial Community Health Assessment by DNA Hybridization and Microbial Identification and Enumeration: a Methodological Comparison. (021) S. E. PALMER,\* B. R. NEIDERLEHNER, and J. CAIRNS, JR. Univ. Ctr. for Environmental and Hazardous Materials Studies, Virginia Polytechnic Inst., Blacksburg.
- Q225.** Differentiation of Human from Nonhuman Contamination by Amplification of Multicopy Human-Specific DNA Sequences. (023) S. C. EDBERG,\* P. JAY, and D. CALLAN. Yale Univ. Sch. of Med., New Haven, Conn.
- Q226.** The Use of Phospholipid Fatty Acid Profiles in Determining Phylogenetic Relationships among Dissimilatory Sulfate-Reducing Bacteria. (025) L. L. KOHRING,\* D. B. RINGELBERG, M. W. MITTELMAN, and D. C. WHITE. Univ. of Tennessee, Ctr. for Environmental Biotechnology, Knoxville.
- Q227.** Identifying Combinations of Bacteria in Frozen Yogurt by Multivariate Cluster Analysis of the Cellular Fatty Acid Profiles. (027) M. G. SINCLAIR. Microcheck, Inc., Northfield, Vermont.
- Q228.** Examination of *Pseudomonas diminuta* Used in Filter Retention Testing Using Environmental Scanning Electron Microscopy. (029) L. LAVELLE,\* M. BRINKLEY, and M. UMANA-MURRAY. Glaxo Inc., Research Triangle Park, N.C.
- Q229.** Diluent Matrix Effect Considerations on Developing Microbiological Protocols. (031) A. H. T. CHAN\* and J. GIGLIOTTI. QA Management Inc., Ancaster, Ontario, Canada.
- Q230.** Formulation of Culture Media for Measuring Capacitance Changes during Bacterial Growth. (033) P. A. NOBLE,\* M. DZIUBA, and W. L. ALBRITTON. Provincial Lab. of Publ. Health, Univ. of Alberta, Edmonton, Alberta, Canada, and Univ. of Saskatchewan, Saskatoon, Saskatchewan, Canada.
- Q231.** A 12-h Model Method for Detection of *Staphylococcus aureus* from Bovine Mastitis. (035) J. A. MANNING, JR.,\* and S. E. KATZ. Bristol-Myers Squibb Co., Princeton, N.J., and Rutgers Univ., New Brunswick, N.J.

### Session 195 (Q). BIOTRANSFORMATION AND DEGRADATION III: AROMATIC AND HETEROCYCLIC COMPOUNDS

- Q232.** Metabolites Observed during Anaerobic Toluene Degradation by Strain T1. (037) A. C. FRAZER,\* W. LING, P. J. EVANS, and L. Y. YOUNG. NYU Med. Ctr., New York, N.Y.
- Q233.** Anaerobic Degradation of Toluene under Denitrifying Conditions in Bacterial Isolate Tol-4. (039) J. CHEE-SANFORD,\* M. FRIES, and J. M. TIEDJE. Michigan State Univ., East Lansing.
- Q234.** Kinetics of Toluene and *o*-Degradation by a Methanogenic Consortium. (041) E. A. EDWARDS\* and D. GRBIGALIC. Environmental Engineering and Sci., Dept. of Civil Engineering, Stanford Univ., Stanford, Calif.
- Q235.** Biotransformation of Monoaromatic Hydrocarbons under Anoxic Conditions. (043) H. A. BALL,\* M. REINHARD, and P. L. MCCARTY. Western Region Hazardous Substance Res. Ctr., Stanford Univ., Stanford, Calif.
- Q236.** Characterization of the Veratrate Induction of Anaerobic *O*-Demethylation in *Eubacterium limosum*. (045) A. C. FRAZER\* and M. H. BERMAN. NYU Med. Ctr., New York, N.Y.
- Q237.** H<sub>2</sub>/CO<sub>2</sub>-Assisted Anaerobic *O*-Demethylation Activity in Subsurface Sediments. (047) S. LIU\* and J. M. SUFLITA. Univ. of Oklahoma, Norman.
- Q238.** Use of Fluorophenols and 3-Fluorobenzoic Acid To Study the Transformations of Phenol under Methanogenic Conditions. (049) K. L. LONDRY\* and P. M. FEDORAK. Univ. of Alberta, Edmonton, Alberta, Canada.
- Q239.** Microbiological Study of Anaerobic Biodegradation of *p*-Cresol by Methanogenic Fermentation. (051) R. BEAUDET\* and J. G. BISAILLON. Inst. Armand-Frappier, Univ. du Québec, Ville de Laval, Quebec, Canada.
- Q240.** Fermentative Degradation of Hydroaromatic Compounds. (053) A. BRUNE\* and B. SCHINK. Univ. Tübingen, Tübingen, Germany.

- Q241.** Biotransformation of Indole and Quinoline under Denitrifying Conditions. (055) J. N. P. BLACK,\* R. M. KAUFFMAN, and D. E. GALIC. Stanford Univ., Stanford, Calif.
- Q242.** Microbial Transformation of Quinoline and Acenaphthene under Sulfate-Reducing Conditions. (057) I. MRAKOVIC\* and D. GRBIC-GALIC. Dept. of Civil Engineering, Stanford Univ., Stanford, Calif.
- Q243.** Biotransformation of Quinoline and Methyl Quinolines in Anoxic Freshwater Sediment. (059) S.-M. LIU,\* W. J. JONES, and J. E. ROGERS. Univ. of Georgia and U.S. EPA, Athens.
- Q244.** Biotransformation of Quinoline by a Soil Bacterium. (061) S. SUTTON\* and J. R. VESTAL. Univ. of Cincinnati, Cincinnati, Ohio.
- Q245.** Biodegradation of 6-Methylquinoline by *Pseudomonas putida* in an Immobilized Cell Bioreactor. (063) S. ROTHENBURGER\* and R. M. ATLAS. Dept. of Biol., Univ. of Louisville, Louisville, Ky.
- Q246.** The Metabolic Fate of Halogenated and Nonhalogenated *N*-, *S*-, and *O*-Heterocyclic Compounds in Anoxic Aquifer Slurries. (065) N. R. ADRIAN\* and J. M. SUFLITA. Univ. of Oklahoma, Norman.
- Q247.** Characterization of 2-Methylpyridine-Degrading Bacterium Isolated from Subsurface Sediments. (067) E. O'LOUGHLIN,\* G. SIMS, and S. TRAINA. Ohio State Univ., Columbus, and DowElanco, Midland, Mich.
- Q248.** Fed Batch Model for Design, Interpretation, and Performance Evaluation of Bioremediation Enrichments. (069) S. M. ARNOLD, R. F. HARRIS, and W. J. HICKEY.\* Environmental Toxicology Ctr. and Dept. of Soil Sci., Univ. of Wisconsin, Madison.
- Q249.** Effects of Selected Agrochemicals and Insecticide Metabolites on Growth and Carbofuran Degradation by a Carbofuran-Hydrolyzing Bacterium. (071) E. TOPP. CLBRR, Agriculture Canada, CEF Ottawa, Ontario, Canada.
- Q250.** Disposal of Carbofuran Using Solid-State Fermentation Techniques. (073) R. H. TARABAN,\* D. F. BERRY, R. A. TOMKINSON, and D. E. MULLINS. Virginia Polytechnic Inst. and State Univ., Blacksburg.

### Session 196 (I). MICROBIAL SYMBIOSIS AND DEVELOPMENT

- I68.** The Largest Prokaryote. (075) E. R. ANGERT,\* K. D. CLEMENTS, and N. R. PACE. Indiana Univ., Bloomington, and Univ. of Sydney, Sydney, Australia.
- I69.** Characterization of a Predaceous Bacterium That Utilizes Only *Caulobacter crescentus* as Its Prey. (077) S. F. KOVAL\* and S. H. HYNES. Univ. of Western Ontario, London, Ontario, Canada.
- I70.** Transcripts Expressed during Macrocyst Development in *Dictyostelium mucoroides*. (079) M. LARSON\* and A. T. WEBER. Univ. of Nebraska, Omaha.
- I71.** Acid-Activatable Cysteine Proteinases in *Dictyostelium discoideum*: Studies of Reversibly Blocked Aggregations in Microtitre Plates. (081) D. A. COTTER,\* T. W. SANDS, and M. J. NORTH. Dept. of Biol. Sci., Univ. of Windsor, Windsor, Ontario, Canada, and Dept. of Biol. and Molecular Sci., Univ. of Stirling, Stirling, Scotland.
- I72.** Spore Germination in *Dictyostelium discoideum*: Pharmacological Studies of Autoactivation. (083) K. J. VIRDY,\* D. A. COTTER, and T. W. SANDS. Dept. of Biol. Sci., Univ. of Windsor, Windsor, Ontario, Canada.
- I73.** *pdsA* Mutations Block *Dictyostelium discoideum* Development by Posttranscriptionally Reducing Levels of Cyclic Nucleotide Phosphodiesterase mRNA. (085) G. J. PODGOR-

- SKI,\* D. L. WELKER, and D. HANSEN. Utah State Univ., Logan.
- I74.** Detection of *Vibrio fischeri* Autoinducer in Symbiotic Squid Light Organs. (087) K. J. BOETTCHER\* and E. G. RUBY. USC, Los Angeles, Calif.
- I75.** Ecological Interactions between Luminous *Vibrio fischeri* and Their Symbiotic Animal Hosts. (089) K.-H. LEE,\* J. N. DESIMONE, and E. G. RUBY. USC, Los Angeles, Calif.
- I76.** Nonmotile *Vibrio fischeri*: Construction by Transposon Mutagenesis and Infectivity in Light Organ Symbiosis. (091) J. GRAF,\* P. V. DUNLAP, and E. G. RUBY. USC, Los Angeles, Calif., and Woods Hole Oceanographic Inst., Woods Hole, Mass.
- I77.** Regulation of a Signal-Dependent Gene Expressed Early during *Myxococcus xanthus* Development. (093) H. B. KAPLAN. Univ. of Texas Health Sci. Ctr., Houston.
- I78.** Critical Domains on the C-Signal of *Myxococcus xanthus*. (095) J. ROBLES\* and L. J. SHIMKETS. Dept. of Microbiol., Univ. of Georgia, Athens.
- I79.** Second-Site Mutations That Restore Development to a Cell-Cell Signaling Mutant of *Myxococcus xanthus*. (097) K. LEE\* and L. SHIMKETS. Dept. of Microbiol., Univ. of Georgia, Athens.
- I80.** Developmentally Regulated Promoters in *Streptomyces coelicolor*. (099) F. BASALYGA,\* H. MA, and K. KENDALL. Tulane Univ., New Orleans, La.
- I81.** Cloning and Sequence Analysis of a Cell Division Penicillin-Binding Protein from *Bacillus subtilis*. (101) A. YANOURI\* and C. BUCHANAN. Southern Methodist Univ., Dallas, Tex.
- I82.** *Rhizobium meliloti* Contains Two Distinct Homologs of the Essential Cell Division Gene *ftsZ*. (103) W. MARGOLIN\* and S. R. LONG. Stanford Univ., Stanford, Calif.
- I83.** Characterization of FtsA Protein from Wild-Type *Escherichia coli* Cells by Western Blotting. (105) H. WANG\* and R. GAYDA. Dept. of Microbiol., Louisiana State Univ., Baton Rouge.

### Session 197 (K). OUTER AND INNER MEMBRANES: STRUCTURE AND FUNCTION

- K86.** An Outer Membrane Protein of *Escherichia coli* Which Retains Its Association with Lipopolysaccharide after Denaturation. (107) M. A. STEIN,\* J. COLEMAN, and D. L. DIEDRICH. Idaho State Univ. Col. of Pharmacy, Pocatello, and Louisiana State Univ. Med. Ctr., New Orleans.
- K87.** Effect of Photo-Cross-Linking on Membrane Proteins of *Escherichia coli*. (109) M. H. BAYER\* and M. E. BAYER. Fox Chase Cancer Ctr., Inst. for Cancer Res., Philadelphia, Pa.
- K88.** Assembly and Targeting of *Escherichia coli* Outer Membrane Proteins. (111) R. MISRA. Arizona State Univ., Tempe.
- K89.** Reevaluation of the Role of EDTA in Lysis of *Pseudomonas aeruginosa* Cell Walls. (113) S. WATT\* and A. J. CLARKE. Dept. of Microbiol., Univ. of Guelph, Guelph, Ontario, Canada.
- K90.** Chlorine-Induced Disruption of Outer Membrane Lipids and Proteins of Drinking-Water Bacteria. (115) J. J. CALO-MIRIS. Johns Hopkins Univ., Baltimore, Md.
- K91.** Translocation of an Outer Membrane Protein into Prey Cytoplasmic Membranes by *Bdellovibrios*. (117) J. J. TUDOR\* and M. A. KARP. St. Joseph's Univ., Philadelphia, Pa.
- K92.** Localization of Cytochromes to the Outer Membrane of Anaerobically Grown *Shewanella putrefaciens* MR-1. (119) C. R. MYERS\* and J. M. MYERS. Dept. of Pharmacology and Toxicology, Med. Col. of Wisconsin, Milwaukee.

- K93.** Hydrogen-Ubiquinone Oxidoreductase Activity by *Bradyrhizobium japonicum* Membrane-Bound Hydrogenase. (121) D. M. FERBER,\* B. MOY, and R. J. MAIER. Johns Hopkins Univ., Baltimore, Md.
- K94.** Modulation of Membrane Proteins of *Shewanella colwelliana* in Response to Nutrient Flux. (123) D. POWELL,\* R. M. WEINER, and A. ENRIQUEZ. Univ. of Maryland, College Park.
- K95.** Structure, Function, and Expression of TolA, a Membrane Protein Required for Uptake of Colicins and Filamentous Phage in *Escherichia coli*. (125) E. M. CLICK,\* M. M. MULLER, S. K. LEVENGOOD, and R. E. WEBSTER. Duke Univ., Durham, N.C.
- K96.** Cloning, Sequencing, and Expression of the *Escherichia coli* *htrD* Gene, Whose Product Is Required for Growth at High Temperature. (127) J. M. DELANEY\* and C. GEORGOPOULOS. Univ. of Utah, Salt Lake City.
- K97.** Association of the PutA Protein with the Cell Membrane in *Escherichia coli* Requires Components of the Aerobic Electron Transport Chain. (129) C. E. DEUTCH. Univ. of Nevada, Las Vegas.
- K98.** Determination of Membrane Topology for Binding Protein-Dependent Transport Systems Using *TnpA*' Prime Elements. (131) W. W. METCALF\* and B. L. WANNER. Purdue Univ., West Lafayette, Ind.
- K99.** Is Signal Sequence Cleavage Required for Outer Membrane Protein Targeting in *Escherichia coli*? (133) J. CARLSON\* and T. SILHAVY. Princeton Univ., Princeton, N.J.
- K100.** *prc* from *Escherichia coli*, a Locus of Suppressors of Signal Sequence Mutations, Is Homologous to the *Salmonella typhimurium* Endopeptidase Gene *opdA*. (135) C. A. CONLIN,\* N. J. THRUN, and C. G. MILLER. Univ. of Illinois, Urbana, and Princeton Univ., Princeton, N.J.
- K101.** SecD and SecE and Protein Export in *Escherichia coli*. (137) J. POGLIANO,\* K. JOHNSON, and J. BECKWITH. Dept. of Microbiol., Harvard Med. Sch., Boston, Mass.
- K102.** Pentose Uptake Insensitive to Inducer Exclusion in *Pediococcus halophilus*. (139) K. ABE,\* K. UCHIDA, and E. NAKANO. Kikkoman Corp., Noda, Chiba Pref., Japan.
- K103.** Characterization of a Monoclonal Antibody Which Inhibits the ATPase Activity of the Molecular Chaperone GroEL. (141) J. L. GOULD-KOSTKA,\* J. L. ARCINIEGA, and D. L. BURNS. Div. of Bacterial Products, FDA, Bethesda, Md.
- K104.** In Vitro Suppression of Translocation Defect of Precursors with Mutated Signal Peptides. (143) N. YU\* and P. C. TAI. Dept. of Biol., Georgia State Univ., Atlanta.
- K105.** Deletion Analysis of the Secretion of the Heat-Stable Enterotoxin of *Escherichia coli* (*estA3*). (145) Y. YANG, Z. GAO, K. TACHIAS, L.-M. GUZMAN-VERDUZCO, and Y. M. KUPERSZTOCH.\* Dept. of Microbiol., Univ. of Texas Southwestern Med. Ctr., Dallas, and Dept. of Microbiol. and Molecular Genetics, Harvard Univ., Boston, Mass.
- K106.** Reevaluation of the Exclusion Limit and Role of Porin OprF in *Pseudomonas aeruginosa* Outer Membrane Permeability. (147) F. BELLIDO,\* N. L. MARTIN, and R. J. SIEHNEL. Univ. of British Columbia, Vancouver, British Columbia, Canada.
- K107.** Immunological Relatedness of Enteric Bacterial Porins Assessed with Monoclonal Antibodies to *Salmonella typhimurium* OmpD and OmpC (149) S. R. SINGH,\* Y. UPSHAW, T. ABDULLAH, P. E. KLEBBA, and S. P. SINGH. Alabama State Univ., Montgomery, and Med. Col. of Wisconsin, Milwaukee.
- K108.** Involvement of His 21 in the pH-Induced Switch in Porin Channel Size. (151) J. C. TODT\* and E. J. MCGROARTY. Michigan State Univ., East Lansing.
- K109.** Purification and Characterization of a Cell Wall-Associated Arginine Carboxypeptidase from *Streptococcus mitis* ATCC 15909. (153) L. E. LINDER,\* M.-L. SUND, and H. LONNIES. Karolinska Inst., Stockholm, Sweden.
- K110.** Site-Directed Mutagenesis within the Ferric Enterobactin- and Colicin-Binding Domains of *Escherichia coli* FepA. (155) J. M. RUTZ,\* J. LIU, J. B. FEIX, and P. E. KLEBBA. Med. Col. of Wisconsin, Milwaukee.
- K111.** *Escherichia coli* Enterobactin Synthetase Need Not Be a Membrane-Bound Multienzyme Complex. (157) M. C. AMMERLAAN\* and C. F. EARHART. Univ. of Texas, Austin.
- K112.** Comparative Molecular Analysis of the Enterobactin Biosynthesis Gene *entD* from Enteric Bacteria. (159) K. A. JOHANSEN,\* S. DE BRITO, and M. A. MCINTOSH. Univ. of Missouri, Columbia.

### Session 198 (C). MOLECULAR TECHNIQUES FOR DETECTION AND CHARACTERIZATION OF ORGANISMS OF CLINICAL SIGNIFICANCE

- C181.** Detection of Genes in Feces by Using Booster DNA Amplification. (161) P. SAULNIER\* and A. ANDREMONT. Inst. Gustave-Roussy, Villejuif, France, and Faculté de Pharmacie, Chatenay-Maiaabry, France.
- C182.** Optimization of Human T-Cell Leukemia Virus (HTLV) Types I and II Polymerase Chain Reaction Amplification Buffer Components Using HTLV-Positive Control and Clinical Samples. (163) R. RESPESS,\* D. CASAREALE, L. WOLFE, and T. FRENKL. Roche Diagnostic Systems, Inc., Fair Lawn, N.J.
- C183.** Characterization of *Listeria monocytogenes* Strains by Pulsed-Field Gel Electrophoresis. (165) M. A. MOORE, F. M. KHAMBATY,\* and A. R. DATTA. Div. of Microbiol., FDA, Washington, D.C.
- C184.** Detection of Low-Copy-Number Meningococci in Cerebrospinal Fluid by Nested Polymerase Chain Reaction and Characterization of the Target Gene by Direct Sequencing. (167) N. B. SAUNDERS,\* V. B. RAO, and W. D. ZOLLINGER. Walter Reed Army Inst. of Res. and Catholic Univ. of America, Washington, D.C.
- C185.** Evaluation of a Reformulated DNA Probe for *Mycobacterium avium* Complex (Gen-Probe) and Comparison with the SNAP *M. avium* Complex DNA Probe (Syngene). (169) P. R. CLARNER,\* D. E. SIMMONS, P. H. VANCE, and A. S. WEISSFELD. Microbiol. Specialists Inc., Houston, Tex.
- C186.** Treatment of Clinical Specimens Containing *Mycobacterium tuberculosis* by Sonication To Remove DNA for Polymerase Chain Reaction. (171) G. BUCK,\* L. C. O'HARA, and J. T. SUMMERSGILL. Alliant Health System and Univ. of Louisville, Louisville, Ky.
- C187.** Genome Analysis of *Pseudomonas cepacia* by Field Inversion Gel Electrophoresis: Preliminary Study. (173) P. S. MITCHELL,\* L. A. CARSON, J. M. MILLER, and D. A. PEGUES. CDC, Atlanta, Ga.
- C188.** rRNA Gene Restriction Patterns of *Pseudomonas cepacia* from Cystic Fibrosis Patients in Summer Camps. (175) L. A. CARSON\* and D. A. PEGUES. CDC, Atlanta, Ga.
- C189.** Antigenic Patterns of *Pseudomonas pseudomallei* by Western Blot Assay. (177) S. CHANTARACHADA, S. REINPRAYOON, P. TIENSIWAKUL,\* A. CHONGTHALEONG, K. SAITANU, N. CHAISIRI, S. WONGSAWANG, and P. PUNYARATABANDHU. Chulalongkorn Univ., Bangkok, Thailand.
- C190.** Molecular Typing of *Staphylococcus aureus* by Polymerase Chain Reaction Analysis of the 3' End of the Staphylo-

coagulase Gene. (179) S. H. GOH,\* S. K. BYRNE, J. L. ZHANG, V. T. LEE, and A. W. CHOW. Univ. of British Columbia and British Columbia Ctr. for Disease Control, Vancouver, British Columbia, Canada.

- C191. Detection and Molecular Characterization of Endemic Strains of Coagulase-Negative Staphylococci in a Neonatal Intensive Care Unit. (181) H. BIALKOWSKA-HOBRZANSKA,\* D. JASKOT, K. MCGEE, W. ZHONG, S. MCVEAN, and O. HAMMERBERG. Lawson Res. Inst., St. Joseph's Health Ctr., London, Ontario, Canada.
- C192. Molecular Characterization of Bloodstream Isolates of Coagulase-Negative Staphylococci in a Neonatal Intensive Care Unit. (183) H. BIALKOWSKA-HOBRZANSKA, D. JASKOT, V. HARRY, and O. HAMMERBERG.\* Lawson Res. Inst., St. Joseph's Health Ctr., London, Ontario, Canada.
- C193. Use of GenProbe Pneumococcus Identification Probe Test To Confirm Identification of *Streptococcus pneumoniae* from Respiratory Specimens. (185) N. E. PIGOTT,\* R. E. DAVIS, and R. R. FACKLAM. CDC, Atlanta, Ga.
- C194. Identification of Nontypeable *Streptococcus pneumoniae* Isolated from Sterile Sources with the GenProbe *Pneumococcus* Identification Test. (187) R. R. FACKLAM\* and N. E. PIGOTT. CDC, Atlanta, Ga.
- C195. Variability of Pneumococcal Surface Protein A (PspA) among Alaskan Isolates of *Streptococcus pneumoniae* Capsular Serotype 6B. (189) M. J. CRAIN,\* Z. LIANG, and A. J. PARKINSON. Univ. of Alabama, Birmingham, and Arctic Investigations Program, Nat. Ctr. for Infectious Diseases, CDC, Anchorage, Alaska.
- C196. Applications of Polymerase Chain Reaction for Detection of Toxin Genes in *Vibrio cholerae* O1 Strains from the Latin American Epidemic. (191) P. FIELDS and T. POPOVIC.\* CDC, Atlanta, Ga.
- C197. Genetic Properties of Toxigenic *Vibrio cholerae* O1 from the Latin American Epidemic. (193) I. K. WACHSMUTH,\* G. M. EVINS, C. A. BOPP, P. I. FIELDS, O. OLSVIK, T. J. BARRETT, and J. G. WELLS. CDC, Atlanta, Ga.
- C198. Three Genotypes of *Vibrio cholerae* O1 Enterotoxin Based on DNA Sequences. (195) O. OLSVIK,\* P. FIELDS, I. K. WACHSMUTH, J. WAHLBERG, B. PETTERSON, and M. UHLEN. CDC, Atlanta, Ga.; Norwegian Col. of Vet. Med., Oslo, Norway; and Royal Inst. of Technology, Stockholm, Sweden.
- C199. Molecular Typing of *Vibrio cholerae* O1 by Pulsed-Field Gel Electrophoresis. (197) T. J. BARRETT,\* D. N. CAMERON, and I. K. WACHSMUTH. Nat. Ctr. for Infectious Diseases, CDC, Atlanta, Ga.
- C200. Comparison of Pulsed-Field Gel Electrophoresis Chemiluminescent Ribotyping and Fatty Acid Analysis for Typing *Xanthomonas maltophilia*. (199) J. R. UHL,\* L. STOCKMAN, N. K. HENRY, C. A. GUSTAFERRO, J. E. ROSENBLATT, B. C. KLINE, and D. H. PERSING. Mayo Clin. and Mayo Fndn., Rochester, Minn.
- C201. Colorimetric Detection Method for Qualitative and Quantitative Analysis of In Vitro-Amplified Material. (201) J. LUNDEBERG,\* A. HEDRUM, J. WAHLBERG, K. HULT, and M. UHLEN. Dept. of Biochemistry and Biotechnology, Royal Inst. of Technology, Stockholm, Sweden.

### Session 199 (G). MOLLICUTES: MOLECULAR AND CELL BIOLOGY

- G13. Clonal Variation in Gene Copy Number in *Mycoplasma hyorhinis*: a Genetic Amplification Process? (203) G. DENG\* and M. MCINTOSH. Univ. of Missouri, Columbia.

- G14. Genomic Rearrangements Involving Insertion Elements Present in *Mycoplasma pulmonis*. (205) B. BHUGRA\* and K. DYBVIK. Univ. of Alabama, Birmingham.
- G15. Molecular Cloning and Nucleotide Sequence of a Putative *infC-rpm1-rplT* Operon from *Mycoplasma fermentans* (*incognitus* Strain). (207) W. S. HU,\* R. WANG, J. SHIH, and S.-C. LO. American Registry of Pathology, Armed Forces Inst. of Pathology, Washington, D.C., and Cinn. Ctr., NIH, Bethesda, Md.
- G16. Identification of a *Mycoplasma arthritidis* Extrachromosomal DNA Element. (209) L. L. VOELKER,\* S. HIRSCH, K. E. WEAVER, and L. R. WASHBURN. Univ. of South Dakota Sch. of Med., Vermillion.
- G17. Targeted Mutagenesis of a Mycoplasma. (211) A. WOODARD\* and K. DYBVIK. Univ. of Alabama, Birmingham.
- G18. Development of an Expression System for the Cloning of Mycoplasma Genes in *Escherichia coli*. (213) B. K. SMILEY\* and F. C. MINION. Vet. Med. Res. Inst., Iowa State Univ., Ames.
- G19. Comparison of the *Mycoplasma hyopneumoniae* and *Mycoplasma flocculare* 5S rRNA genes. (215) Y. HUANG and G. W. STEMKE.\* Univ. of Alberta, Edmonton, Alberta, Canada.
- G20. Relationships between Mycoplasma Phylogeny and Molecular Biology. (217) J. MANILOFF. Univ. of Rochester, Rochester, N.Y.
- G21. Phylogenetic Relationships between *Ureaplasma urealyticum* 16S rRNA Nucleotide Sequences. (219) J. A. ROBERTSON,\* A. VEKRIS, C. BEBEAR, and G. W. STEMKE. Univ. of Alberta, Edmonton, Alberta, Canada, and Univ. de Bordeaux II, Bordeaux, France.
- G22. Fluorometric Quantitation of Broth-Cultured Mycoplasmas Using Alkaline Ethidium Bromide. (221) W. I. SCHAEFFER,\* S. SIMKINS, J. WILSON, and R. MELAMEDE. Univ. of Vermont, Burlington.
- G23. Metabolic Limitations at the Pyruvate Locus in *Ureaplasma urealyticum*. (223) J. W. DAVIS, JR.,\* D. EDWARDS, D. ESTRELLA, E. LORENZO, and L. OKUNOLA. Bronx Community Col., City Univ. of New York, Bronx, N.Y.
- G24. Incorporation of <sup>32</sup>P from Labeled Synthetic Oligodeoxynucleotides into Mycoplasma RNA. (225) L. D. OLSON,\* L. M. NECKERS, and D. A. GESELOWITZ. Lab. of Mycoplasma, Ctr. for Biologics Evaluation and Res., FDA, and Nat. Cancer Inst., Bethesda, Md.
- G25. Continuous Perfusion <sup>13</sup>C-Nuclear Magnetic Resonance Analysis of Arginine and Glucose Metabolism in Mycoplasmas. (227) C. RENSCHAW,\* J. BOAL, S. ROTTEM, W. EGAN, M. BARILE, and L. OLSON. Ctr. for Biologics Evaluation and Res., FDA, Bethesda, Md.
- G26. Preliminary Characterization and Isolation of the *Mycoplasma pulmonis* Membrane-Bound Nucleases. (229) K. JARVILL-TAYLOR\* and F. C. MINION. Vet. Med. Res. Inst., Iowa State Univ., Ames.

### Session 200 (U). DIAGNOSIS OF MYCOBACTERIAL INFECTIONS

- U57. Polymerase Chain Reaction for Detection of Mycobacterial Disease in Africa. (231) G. RODRIGO,\* F. DIAS, R. NORBERG, S. HOFFNER, G. KALLENIUS, and S. B. SVENSON. Lab. Nacional de Saude Publica, Bissau, Guinea Bissau, and Nat. Bacteriol. Lab., Stockholm, Sweden.
- U58. Rapid Typing of Mycobacteria by the Polymerase Chain Reaction. (233) A. TELENTI, C. GERBER, M. MARCHESI, and T. BODMER.\* Inst. of Med. Microbiol., Univ. of Berne, Berne, Switzerland.



- U59. Rapid Detection of *Mycobacterium tuberculosis* by Polymerase Chain Reaction. (235) Y. YAOQIN,\* Z. XIAOPING, T. JINHUI, and L. DERU. Changzheng Hosp., Second Military Med. Univ., Shanghai, Peoples Republic of China.
- U60. Detection of Mycobacteria by Polymerase Chain Reaction and Species Identification by Reverse Dot-Blot Hybridization. (237) K. K. Y. YOUNG,\* E. ROBINSON, A. DARE, and E. H. FISS. Cetus Corp., Emeryville, Calif., and Univ. of California, San Francisco.
- U61. Detection of *Mycobacterium tuberculosis* in Pleural Fluids and Pleural Biopsy Materials by Polymerase Chain Reaction. (239) T-Y LEE\* and S-K. KIM. Dept. of Microbiol., Yeungnam Univ. Col. of Med., Taegu, Korea.
- U62. Detection of *Mycobacterium kansasii* from a Brain Lesion and *Mycobacterium avium* from Blood of an AIDS Patient by Using Polymerase Chain Reaction and Reverse Dot Blot Hybridization. (241) E. FISS,\* M. K. YORK, and G. F. BROOKS. Univ. of California, San Francisco.
- U63. Stability of the DNA Fingerprint of *Mycobacterium tuberculosis*. (243) G. L. TEMPLETON,\* M. SALFINGER, M. D. CAVE, K. D. EISENACH, G. H. MAZUREK, J. T. CRAWFORD, and J. H. BATES. Univ. of Arkansas for Med. Sci. and VA Hosp., Little Rock; CDC, Atlanta, Ga.; Univ. of Zurich, Zurich, Switzerland; and Univ. of Texas Health Sci. Ctr., Tyler.
- U64. DNA Polymorphism in *Mycobacterium tuberculosis* Analyzed by Pulsed-Field Gel Electrophoresis. (245) Y. ZHANG,\* G. H. MAZUREK, M. D. CAVE, K. D. EISENACH, Y. PANG, D. T. MURPHY, and R. J. WALLACE, JR. Univ. of Texas Health Center, Tyler, and Univ. of Arkansas for Med. Sci. and J.L. McClellan Mem. Veterans Hosp., Little Rock.
- U65. Identification of *Mycobacterium avium* Complex Isolates by Means of Two DNA probes. (247) K. G. BEAVIS,\* K. PRATT, and G. KARASKY-HALL. Cleveland Clin. Fndn., Cleveland, Ohio.
- U66. Identification and Prevalence of the X Cluster of *Mycobacterium avium* Complex Isolates in NIH Patients. (249) P. S. CONVILLE,\* J. W. B. ANDREWS, and F. G. WITEBSKY. NIH, Bethesda, Md.
- U67. Rapid Detection of Mycobacteria in a Community Hospital by Using BACTEC 12B Broth and DNA Probes. (251) J. B. FAULK,\* R. B. CAPEY, and A. THOMPSON. St. Francis Hosp., Evanston, Ill.
- U68. Growth Index Cutoff from BACTEC Bottles and Use of 7H9 Broth for Mycobacterial Identification with DNA Probes. (253) K. CHAPIN-ROBERTSON,\* S. DAHLBERG, S. WAYCOTT, and J. CORRALES. Yale Univ. Sch. of Med., New Haven, Conn.
- U69. Automated Identification of Mycobacteria by High-Performance Liquid Chromatography Using Computer-Aided Pattern Recognition Algorithms. (255) K. C. JOST, JR.,\* and D. DUNBAR. Texas Dept. of Health, Austin.
- U70. Utility of High-Performance Liquid Chromatography for Identification of Mycobacteria in Extent-4 Laboratories. (257) L. S. GUTHERTZ,\* S. D. LIM, Y. JANG, and P. S. DUFFEY. Microbial Diseases Lab., California Dept. of Health Services, Berkeley.
- U71. Comparison of Frequency-Pulsed Electron-Capture Gas-Liquid Chromatography (GLC), Electron Impact Mass Spectrometry (MS) GLC, and Chemical Ionization (CI) MSGLC for Detection of Tuberculostearic Acid. (259) J. B. BROOKS. CDC, Atlanta, Ga.
- U72. Identification of Pigmented, Nonpigmented, and Accu-probe-Negative Strains of *Mycobacterium gordonae* by High-Performance Liquid Chromatography of Mycolic Acid Esters. (261) M. M. FLOYD,\* V. A. SILCOX, and C. L. WOODLEY. CDC, Atlanta, Ga.
- U73. Identification of Difficult-To-Grow Mycobacteria with High-Performance Liquid Chromatography. (263) W. R. BUTLER\* and J. O. KILBURN. CDC, Atlanta, Ga.
- U74. Serological Measurements Using A60 Antigen in Diagnosis of Mycobacterial Infections. (265) C. RODRIGUES, A. MEHTA,\* T. R. BHATT, A. HAKIMIYAN, and B. SHAH. Microbiol. Sect., Dept. of Lab. Med., P. D. Hinduja Nat. Hosp. and Med. Res. Ctr., Bombay, India.

### Session 201 (D). POLYMERASE CHAIN REACTION AND OTHER DNA ASSAYS FOR DETECTION OF PATHOGENS

- D120. Uracil-N-Glycosylase Enhances Specificity of Polymerase Chain Reaction Amplifications. (267) S. KWOK,\* C. GATES, R. CASTRO, and J. J. SNINSKY. Cetus Corp., Emeryville, Calif.
- D121. Enhancement of Human T-Lymphotropic Virus Types I and II, Human Immunodeficiency Virus Type 1, and HLA-DQ Alpha Polymerase Chain Reaction Amplification Efficiency Using Uracil-N-Glycosylase. (269) S. KINARD,\* A. BUTCHER, Z. WANG, and J. SPADORO. Roche Diagnostic Systems, Fair Lawn, NJ.
- D122. Nested Primer Sets Avoid False Negatives Due to Inhibitors in Clinical Specimens during Polymerase Chain Reaction Testing for Bacterial DNA Targets. (271) C. M. BLACK,\* T. O. MESSMER, and J. S. THARPE. CDC, Atlanta, Ga.
- D123. Semiautomated Detection of Bacterial DNA or RNA Targets Using Polystyrene Beads and Time-Resolved Fluorescence. (273) D. SHERMAN, L. BENINGSIG, L. DI MICHELLE, R. PETERSON, K. VANDEN BRINK, M. WOODING, and J. GODSEY.\* Baxter-MicroScan Division, West Sacramento, Calif.
- D124. Rapid DNA Probe Assay for Detection of Blood Units Contaminated with Bacteria or Yeasts. (275) W. CURRY and J. J. HOGAN.\* Gen-Probe, Inc., San Diego, Calif.
- D125. Use of a Chemiluminescent Universal Bacterial Probe for Pretransfusion Screening of Blood Products. (277) K. PIPER, M. E. BRECHER, L. BLAND, and D. H. PERSING.\* Mayo Clin./Fndn., Rochester, Minn., and CDC, Atlanta, Ga.
- D126. Epstein-Barr Virus-Related Lymphoma and Semiquantitative Polymerase Chain Reaction in Human Liver Transplantation. (279) M. A. MORGAN,\* N. ALSHAK, A. M. JIMENEZ, M. GEDEBOU, W. S. NICHOLS, and S. A. GELLER. Dept. of Pathology and Lab. Med., Cedars-Sinai Med. Ctr., Los Angeles, Calif.
- D127. Polymerase Chain Reaction for Specific Amplification of *Acanthamoeba* DNA. (281) S. J. GOSS. Tennessee Technological Univ., Cookeville.
- D128. Detection of the Parasite *Toxoplasma gondii* by Amplification of rDNA Sequences using Multiplex Polymerase Chain Reaction. (283) J. M. GUAY,\* D. DUBOIS, M.-J. MORENCY, S. GAGNON, J. MERCIER, and R. C. LEVESQUE. Univ. Laval, Ste-Foy, Quebec, Canada.
- D129. Detection of *Aspergillus fumigatus* by Polymerase Chain Reaction. (285) L. REDDY,\* A. KUMAR, C. ZAMMIT, and V. KURUP. Wayne State Univ., Detroit, Mich., and Med. Col. of Wisconsin, Milwaukee.
- D130. DNA Homologies of Putative *Acinetobacter* sp. Clinical Isolates and Application of DNA Hybridization for Positive Identification. (287) J. B. OLIVER,\* J. D. JOLLIICK, E. A. MACIAS, and M. C. MODRZAKOWSKI. Ohio Univ. Col. of Osteopathic Med., Athens.
- D131. Identification of Pertussis in Children Using Molecular Techniques. (289) Z. M. LI,\* S. A. HALPERIN, D. L.

JANSEN, T. M. FINN, C. R. MANCLARK, and M. J. BRENNAN. Div. of Bacterial Products, Ctr. for Biologics/Evaluation and Res., FDA, Bethesda, Md., and Dalhousie Univ., Halifax, Nova Scotia, Canada.

- D132.** Identification of *Chlamydia pneumoniae* by Polymerase Chain Reaction-Enzyme Immunosorbent Assay. (291) C. A. GAYDOS,\* J. J. EIDEN, L. D. BOBO, and T. C. QUINN. Johns Hopkins Univ., Baltimore, Md., and Nat. Inst. of Allergy and Infectious Diseases, Bethesda, Md.
- D133.** Confirmation of Positive *Chlamydia trachomatis* and *Neisseria gonorrhoeae* Specimens Using a DNA Probe Competition Assay. (293) D. HAND,\* M. BOTT, and R. JOHNSON. Gen-Probe, Inc., San Diego, Calif.
- D134.** Comparative Evaluation of the Gen-Probe GC Assay versus Routine Culture Techniques. (295) R. WELSH, R. BUCK,\* K. STROZEWSKI, and M. MARKOVIC. Kaiser Permanente, St. Luke's Hosp., Cleveland, Ohio.
- D135.** Detection of *Escherichia coli* Serotype O157:H7 Using Specific Oligonucleotides and Polymerase Chain Reaction. (297) M. LOUIE, J. DE AZAVEDO, R. CLARKE, and J. L. BRUNTON.\* Samuel Lunenfeld Res. Inst., Mount Sinai Hosp., Toronto, Ontario, Canada, and Agriculture Canada, Guelph, Ontario, Canada.
- D136.** Molecular Epidemiology of Resistance to Third-Generation Cephalosporins in Isolates of *Klebsiella pneumoniae* in a Children's Hospital. (299) A. SWEET-CORDERO,\* L. E. ESPINOSA, and J. I. SANTOS. Hosp. Infantil de México, Mexico City, Mexico.
- D137.** Amplification of an *invA* Gene Sequence of *Salmonella typhimurium* as a Specific Method of Detection of Salmonella. (301) K. RAHN,\* S. A. DE GRANDIS, R. C. CLARKE, S. A. MCEWEN, J. E. GALAN, C. GINOCCHIO, R. CURTISS III, and C. L. GYLES. Agriculture Canada, Guelph, Allelix Corp., Mississauga, and Univ. of Guelph, Guelph, Ontario, Canada; SUNY Stony Brook, Stony Brook, N.Y.; and Washington Univ., St. Louis, Mo.
- D138.** Polymerase Chain Reaction for Detection of Cholera Toxin Genes in Viable but Nonculturable *Vibrio cholerae*. (303) J. A. K. HASAN,\* M. SHAHABUDDIN, A. HUQ, L. LOOMIS, and R. R. COLWELL. Univ. of Maryland, College Park; NIH, Bethesda, Md.; and New Horizons Diagnostics Corp., Columbia, Md.
- D139.** Polymerase Chain Reaction Amplification of a Hemagglutinin-Protease Gene in *Vibrio mimicus*. (305) M. A. R. CHOWDHURY,\* S. SHINODA, and R. R. COLWELL. Okayama Univ., Okayama, Japan, and Ctr. of Marine Biotechnology, Univ. of Maryland, Baltimore.
- D140.** Rapid Detection of *Vibrio vulnificus* by Using a Fluorescent rDNA Probe. (307) B. BENNISON,\* P. LAROCK, and R. H. REEVES. Florida State Univ., Tallahassee.
- D141.** Short Oligonucleotide Probes for Bacteria Associated with Dental Caries. (309) G. A. CANGELOSI\* and R. J. LAMONT. MicroProbe Corp., Bothell, Wash., and Dept. of Oral Biol., Univ. of Washington, Seattle.
- D142.** Distinguishing between *Mycobacterium paratuberculosis* and *Mycobacterium avium-intracellulare* with a New DNA Probe. (311) D. Y. KUNIMOTO,\* J. SCHAFIQ, and J. COFFIN. Univ. of Alberta, Edmonton, Alberta, Canada.
- D143.** Development of a DNA Probe for *Ureaplasma urealyticum*. (313) J. BROGAN, J. ACCIAI, G. GALLIA, F. MCCLESKEY, and V. DELVECCHIO.\* Univ. of Scranton, Scranton, Pa., and Armstrong Lab./AOEL, Brooks Air Force Base, Tex.

## POSTER SESSIONS

Friday, 10:30-Noon, Exhibit Hall C

(Board numbers in parentheses)

### Session 202 (P). CHARACTERIZATION AND DETECTION OF GRAM-POSITIVE BACTERIA IN FOODS

- P29.** Assessment of the Accuprobe *Listeria monocytogenes* Culture Confirmation Test from Solid and Liquid Cultures. (002) B. NINET, E. BANNERMAN,\* and J. BILLE. Univ. Hosp., Lausanne, Switzerland.
- P30.** Rapid, Sensitive 16S rRNA-Based Polymerase Chain Reaction Method To Detect *Listeria monocytogenes* Cells Added to Foods. (004) R.-F. WANG,\* W.-W. CAO, and M. G. JOHNSON. Food Sci. Dept. and Arkansas Biotechnology Ctr., Univ. of Arkansas, Fayetteville.
- P31.** Sensitivity of Heat-Stressed *Listeria monocytogenes* Cells to Cholic or Deoxycholic Acids. (006) J. EMERSON,\* D. SCOTT, and J. KELLER. Dept. of Food Sci., Univ. of Arkansas, Fayetteville.
- P32.** Assignment of *Listeria monocytogenes* Isolates into Two Major Groups Based on Polymerase Chain Reaction Amplification and Restriction Endonuclease Digestion of the *iap* Gene. (008) E. J. GOLSTEYN THOMAS,\* E. TANAKA, R. KING, and V. P. J. GANNON. Animal Diseases Res. Inst., Agriculture Canada, Lethbridge, Alberta, Canada.
- P33.** Automated Enzyme-Linked Immunosorbent Assay Detection of *Listeria* Contamination Using the VIDAS System. (010) V. ATRACHE,\* M. C. CAVAUD, C. DUPUIS, P. FILLON, C. GRAVENS, R. JOHNSON, J. M. PRADEL, M. RAYMOND, P. RULE, and M. SAULNIER. BioMerieux SA, Marcy l'Etoile, France, and BioMerieux Vitek, Inc., St. Louis, Mo.
- P34.** Occurrence of *Listeria* in Smoked Seafood. (012) R. DILLON,\* T. PATEL, and S. RATNAM. Mem. Univ. of Newfoundland and Publ. Health Ctr., St. John's, Newfoundland, Canada.
- P35.** Effect of Growth Temperature on Proteins Produced by *Listeria monocytogenes*. (014) K. G. COLBURN,\* P. A. TROST, C. A. KAYSNER, C. OMIECINSKI, and M. M. WEKELL. FDA, Bothell, Wash.,
- P36.** In Vitro Murine Macrophagocytosis of *Listeria* Species. (016) H. L. DALLAS\* and A. D. HITCHINS. Div. of Microbiol., FDA, Washington, D.C.
- P37.** Five-Tube Most-Probable-Number Method Using the Fung-Yu Tube for the Enumeration of *Listeria monocytogenes* in Restructured Meat Products during Refrigerated Storage. (018) L. S. L. YU\* and D. Y. C. FUNG. Kansas State Univ., Manhattan.
- P38.** Comparison of the Intestinal Cell Uptake of *Listeria monocytogenes* Strains Isolated from Human Clinical Cases of Listeriosis and from Meat Products. (020) J. LOPEZ,\* E. KARPOWICZ, W. HARGROVE, and S. BECKER. Agriculture Canada, Sackville, New Brunswick, Canada.
- P39.** Attachment of *Listeria monocytogenes* and *Salmonella typhimurium* to Stainless Steel and Buna-N Rubber. (022) E. SOMERS\* and A. C. L. WONG. Food Res. Inst., Univ. of Wisconsin, Madison.
- P40.** Comparison of Two Rapid Serological Methods for Identification of Staphylococcal Enterotoxins in Foods. (024) T. SULLIVAN\* and R. BENNETT. FDA, Washington, D.C.
- P41.** Serological Alteration of *Staphylococcus aureus* Enterotoxin in a Thermally Processed Food. (026) R. BENNETT,\* K. CATHERWOOD, T. SULLIVAN, and L. LUKFY. U.S.

FRIDAY

- FDA, Washington, D.C., and Health and Welfare Canada, Burnaby, British Columbia, Canada.
- P42.** False-Positive Tests for Staphylococcal Enterotoxin with Extracts of Canned Mushrooms Contaminated with *Proteus mirabilis* when Using an Enzyme-Linked Immunosorbent Assay Kit. (028) C. E. PARK,\* M. AKHTAR, and K. F. WEISS. Bureau of Microbial Hazards, Food Directorate, Health Protection Branch. Health and Welfare Canada, Ottawa, Ontario, Canada.
- P43.** Isolation of Staphylococcal Enterotoxins by Immunoaffinity on Hydrazide-Derivatized Solid Support. (030) V. V. MICUSAN,\* F. GAGNON, and A. R. BHATTI. Inst. Armand-Frappier, Laval, Quebec, Canada, and DRES, Ralston, Alberta, Canada.
- P44.** Polymerase Chain Reaction Technique for Detection of *Clostridium botulinum* Type A in Foods. (032) J. L. FERREIRA,\* B. R. BAUMSTARK, M. K. HAMDY, and S. G. MCCAY. FDA and Georgia State Univ., Atlanta, and Univ. of Georgia, Athens.
- P45.** Genome Fingerprint and Physical Map of *Clostridium botulinum* by Pulsed-Field Gel Electrophoresis. (034) W.-J. LIN\* and E. A. JOHNSON. Univ. of Wisconsin, Madison.
- P46.** A 48-kDa Enterotoxin-Related Protein from *Clostridium perfringens* Type A. (036) R. LABBE\* and S. RYU. Univ. of Massachusetts, Amherst.
- P47.** Rapid Method for Production and Purification of *Clostridium perfringens* Type A Enterotoxin. (038) N. L. HEREDIA,\* J. S. GARCIA-ALVARADO, and R. G. LABBE. Univ. A. Nuevo León, San Nicolás, N.L., Mexico, and Univ. of Massachusetts, Amherst.
- P48.** Effects of Modified Atmospheres Containing O<sub>2</sub> and Packaging in Films of Different O<sub>2</sub> Permeability on Toxin Production by *Clostridium botulinum* in Fresh Pork. (040) K. DODDS,\* J. SMITH, and B. BLANCHFIELD. Health and Welfare Canada, Ottawa, Ontario, Canada, and Macdonald Col., Ste. Anne de Bellevue, Quebec, Canada.
- P49.** Further Purification and Immunoassay of Hemolysin BL from *Bacillus cereus*. (042) J. H. HEINRICH,\* P. A. RYAN, C. C. CARSON, B. A. ZILINSKAS, and J. D. MACMILLAN. Cook Col., Rutgers Univ., New Brunswick, N.J.
- N66.** Genetic and Immunological Diversity of Marine Denitrifying Bacteria. (056) B. B. WARD\* and A. R. COCKCROFT. Univ. of California, Santa Cruz.
- N67.** Superoxide Dismutase as a Protective Enzyme against Oxygen Toxicity in the Marine Cyanobacterium *Trichodesmium thiebautii*. (058) K. A. CUNNINGHAM\* and D. G. CAPONE. Chesapeake Biol. Lab., Univ. of Maryland, Solomons.
- N68.** An Indigenous Marine Bacterium as a Reservoir for Genetically Engineered Plasmids in Natural Marine Ecosystems. (060) P. A. SOBECKY,\* M. A. SCHELL, M. A. MORAN, and R. E. HODSON. Univ. of Georgia, Athens.
- N69.** Method for Measuring Virus Production Rates in Aquatic Environments by <sup>32</sup>P Radiolabeling. (062) G. STEWARD,\* J. WIKNER, D. SMITH, W. COCHLAN, and F. AZAM. Scripps Inst. of Oceanography, La Jolla, Calif.
- N70.** Degradation of Viruses in Seawater. (064) R. NOBLE,\* R. WILCOX, and J. FUHRMAN. USC, Los Angeles, Calif.
- N71.** Bacterium-Bacteriophage Interactions in the Chesapeake Bay. (066) R. T. HILL,\* K. E. WOMMACK, and R. R. COLWELL. Ctr. of Marine Biotechnology, Univ. of Maryland, Baltimore.
- N72.** Predation of Nonculturable *Vibrio parahaemolyticus* P-5 by *Bdellovibrio* Isolate SJ. (068) A. J. SCHOEFFIELD,\* H. N. WILLIAMS, and W. A. FALKLER, JR. Loyola Col. and Univ. of Maryland Dent. Sch., Baltimore.
- N73.** Bacterial Biomass and Abundance: Comparison of Bacterial Utilization of Carbon between Tidal Marsh Creeks on the Bayside and Seaside of the Lower Delmarva Peninsula. (070) K. MACMILLIN,\* L. K. BLUM, and A. L. MILLS. Univ. of Virginia, Charlottesville.
- N74.** Adhesion of a Marine Pseudomonad to Solid Substrata: Real-Time Image Analysis of the Effects of Substratum Composition, Time of Exposure, and Shear Stress. (072) K. M. WIENCEK\* and M. FLETCHER. Ctr. of Marine Biotechnology, Univ. of Maryland, Baltimore.
- N75.** Bacterial Numbers and Activity and Microalgal Biomass and Productivity in Sediments Contaminated with Bromophenols Produced by the Marine Polychaete *Notomastus lobatus*. (074) C. C. STEWARD,\* J. PINKNEY, and C. R. LOVELL. Univ. of South Carolina, Columbia.
- N76.** *Streptomyces* in a Salt Marsh Ecosystem: Abundance and Importance for Degradation of Lignin. (076) M. A. MORAN,\* L. T. RUTHERFORD, and R. E. HODSON. Univ. of Georgia, Athens.
- N77.** Growth and Sulfur Transformation of a Black Sea Bacterium That Uses Thiosulfate as an Electron Acceptor. (078) J. KOSTKA,\* K. PERRY, G. LUTHER III, and K. NEALSON. Univ. of Delaware, Lewes, and Ctr. for Great Lakes Studies, Milwaukee, Wis.

### Session 203 (N). MARINE MICROBIAL ECOLOGY

- N60.** Phylogeny of Barophilic and Psychrophilic Deep-Sea Bacteria. (044) E. F. DELONG\* and D. G. FRANKS. Woods Hole Oceanographic Inst., Woods Hole, Mass.
- N61.** Isolation and Phylogenetic Characterization of a Marine Oligobacterium. (046) P. W. LEPP,\* B. R. ROBERTSON, D. K. BUTTON, and T. M. SCHMIDT. Miami Univ., Oxford, Ohio, and Univ. of Alaska, Fairbanks.
- N62.** Novel Bacteria in Marine Plankton as Studied by 16S rRNA Genes Cloned from Biomass. (048) J. A. FUHRMAN,\* K. MCCALLUM, and A. DAVIS. USC, Los Angeles, Calif.
- N63.** Properties of a Deep-Sea Bacterium, DSK-1, Isolated from a Deep-Sea Mud Sample of Japan Trench at 6,500 m Depth. (050) C. KATO,\* S. HATA, and K. HORIKOSHI. DEEPS-TAR Group, Japan Marine Sci. Tech. Ctr., Yokosuka, Kanagawa, Japan.
- N64.** Characterization of New Strains of Nonfermentative, Luminous Bacteria, Isolated from Intermediate Water off Gibraltar. (052) J. MAKEMSON,\* L. AHUMADA, and N. FULAYFIL. Florida Internat. Univ., Miami.
- N65.** Isolation and Ecological Studies of Actinomycetes in the Chesapeake Bay. (054) M. TAKIZAWA\* and R. T. HILL. Ctr. of Marine Biotechnology, Univ. of Maryland, Baltimore.

### Session 204 (H). METABOLIC OPERON ORGANIZATION

- H201.** Cloning of Endo 1,4-β-D-Glucanase Genes from *Ruminococcus* sp. (080) S. K. SRIVASTAVA, A. ALI, and S. KHANNA.\* Microbiol. and Molecular Genetic Unit, Tata Energy Res. Inst., New Delhi, India.
- H202.** Genetic Organization of *Pseudomonas aeruginosa* Acetyl Coenzyme A Carboxylase. (082) E. A. BEST\* and V. C. KNAUF. Calgene, Inc., Davis, Calif.
- H203.** Organization and Regulation of the Mannopine Cyclase-Associated Opine Catabolism Genes in *Agrobacterium tumefaciens* 15955. (084) S. B. HONG,\* Y. DESSAUX, W. S. CHILTON, and S. K. FARRAND. Univ. of Illinois, Urbana; Inst. des Sci. Végétales, France; and North Carolina State Univ., Raleigh.

- H204.** Mutational and Transcriptional Analysis of the *Azotobacter vinelandii* Hydrogenase (*hox*) Gene Cluster. (086) A. L. MENON,\* R. M. ROBSON, L. E. MORTENSON, and R. L. ROBSON. Dept. of Biochemistry, Univ. of Georgia, Athens.
- H205.** Genetic Analysis of Genes Essential for Molybdate Transport in *Escherichia coli*. (088) J. A. MAUPIN\* and K. T. SHANMUGAM. Univ. of Florida, Gainesville.
- H206.** Transcriptional Regulation of the CzcABC Cation Efflux Protein Complex of *Alcaligenes eutrophus* CH34. (090) U. SCHWIDETZKY, K. SCHNEIDER, and D. H. NIES.\* Inst. für Pflanzenphysiologie und Mikrobiologie, Freie Univ. Berlin, Berlin, Germany.
- H207.** Characterization of the *Escherichia coli* *codBA* Operon Encoding Cytosine Permease and Cytosine Deaminase. (092) S. DANIELSEN, M. KILSTRUP, and J. NEUHARD.\* Inst. of Biological Chemistry B, Univ. of Copenhagen, Copenhagen, Denmark.
- H208.** Identification of a *trans*-Acting Factor Involved in *glyA* Gene Control. (094) E. LORENZ,\* P. S. STEIERT, and G. V. STAUFFER. Univ. of Iowa, Iowa City.
- H209.** Genetic Analysis of Lactose Utilization in *Vibrio vulnificus*. (096) P. SHARPE\* and A. MACQUILLAN. Univ. of Maryland, College Park.
- H210.** Cloning and Nucleotide Sequence of Aspartate Transcarbamoylase/Dihydroorotase "AD" Complex in *Pseudomonas putida*. (098) M. J. SCHURR,\* J. F. VICKREY, and G. A. O'DONOVAN. Univ. of North Texas, Denton.
- H211.** Cloning of the Pyruvate Kinase and Phosphoglycerate Mutase Genes from *Zymomonas mobilis*. (100) L. P. YOMANO\* and L. O. INGRAM. Univ. of Florida, Gainesville.
- H212.** Nucleotide Sequence and Expression of Aspartate Transcarbamoylase of *Pseudomonas aeruginosa* and Comparison with Other Transcarbamoylases. (102) J. F. VICKREY,\* M. J. SCHURR, and G. A. O'DONOVAN. Univ. of North Texas, Denton.
- H213.** Creation and Characterization of an *Escherichia coli*/*Pseudomonas* Hybrid Aspartate Transcarbamoylase. (104) J. R. RULEY,\* M. J. SCHURR, A. L. CAMPBELL, and G. A. O'DONOVAN. Univ. of North Texas, Denton.
- H214.** Heterologous Effector Response of the Biosynthetic Enzyme Aspartate Transcarbamoylase among *Pseudomonas* spp. (106) J. F. VICKREY,\* A. LINSKOTT, and A. CAMPBELL. Univ. of North Texas, Denton.
- H215.** Characterization of the Putative Acceptor of Electrons from Hydrogenase, *hoxM*, in *Azotobacter vinelandii*. (108) L. A. SAYAVEDRA-SOTO and D. J. ARP.\* Lab. for Nitrogen Fixation, Botany, Oregon State Univ., Corvallis.
- H216.** Isolation of *Bacillus subtilis* Genes Involved in Siderophore Biosynthesis. (110) T. H. GROSSMAN\* and M. S. OSBURNE. Dept. of Microbial Genetics and Biochemistry, Lederle Lab., Pearl River, N.Y.
- H217.** Characterization of a *Streptomyces coelicolor* DNA Sequence Which in High Copy Globally Blocks Antibiotic Biosynthesis but Not Sporulation. (112) P. RIGGLE,\* P. VANDERVERE, and W. CHAMPNESS. Dept. of Microbiol., Michigan State Univ., East Lansing.
- H218.** Mutations Allowing Expression of the Major Open Reading Frames of the *rhs* Elements of *Escherichia coli*. (114) D. A. VLAZNY\* and C. W. HILL. Milton S. Hershey Med. Ctr., Pennsylvania State Univ., Hershey.
- H219.** Molecular Analysis of the *trpC* Gene of *Zymomonas mobilis*. (116) G. JOHNSON\* and C. K. EDDY. Dept. of Biol. Sci., Mississippi State Univ., Mississippi State.
- H220.** Sequencing and Characterization of the Putative Tylactone Synthase Genes of *Streptomyces fradiae*. (118) B. S. DEHOFF,\* K. L. SUTTON, M. G. GREANEY, C. L. HERSHBERGER, and P. R. ROSTECK, JR. Lilly Res. Lab., Eli Lilly & Co., Indianapolis, Ind.

- H221.** Genes for Quinate and Shikimate Catabolism Are Part of a Supraoperonic Cluster in the *Acinetobacter calcoaceticus* Chromosome. (120) D. ELSEMORE\* and L. N. ORNSTON. Dept. of Biol., Yale Univ., New Haven, Conn.
- H222.** Characterization of *bkdR* and Its Role in the Regulation of *bkd* Operon of *Pseudomonas putida*. (122) K. T. MADHUSUDHAN,\* D. LORENZ, and J. R. SOKATCH. Univ. of Oklahoma, Health Sci. Ctr., Oklahoma City.
- H223.** Mutational Analysis of the Regulation of *cea*, the Gene Encoding Colicin E1. (124) J. D. PERKINS\* and G. M. WEINSTOCK. Univ. of Texas Med. Sch., Houston.
- H224.** Nucleotide Sequence and Transcriptional Analysis of the  $F_1$ -ATP Synthase Operon of *Brucella abortus*. (126) F. M. TATUM,\* S. M. HALLING, M. R. SANBORN, and J. A. BANTLE. Nat. Animal Disease Ctr., Ames, Iowa, and Oklahoma State Univ., Stillwater.

## Session 205 (H). MISCELLANEOUS SHOCK RESPONSES

- H225.** Regulation of Catalase (HPI and HPII) Expression in *Escherichia coli* K-12. (128) H. E. SCHELLHORN,\* V. L. STONES, and S. MUKHOPADHYAY. McMaster Univ., Hamilton, Ontario, Canada.
- H226.** Inducible Hydrogen Peroxide Resistance in *Deinococcus* sp. (130) P. WANG\* and H. E. SCHELLHORN. McMaster Univ., Hamilton, Ontario, Canada.
- H227.** Effects of *himA* and *sox* Mutations on Expression of *sodA* in *Escherichia coli*. (132) L. W. SCHRUM\* and H. M. HASSAN. North Carolina State Univ., Raleigh.
- H228.** Characterization of a *sodA* Mutant of *Escherichia coli*: Cooperativity between *cis*- and *trans*-Acting Regulatory Elements. (134) M. D. BEAUMONT\* and H. M. HASSAN. North Carolina State Univ., Raleigh.
- H229.** Hydrogen Peroxidase I Expression in Stationary Cultures of *Escherichia coli* Is Strongly Induced in Extreme Anaerobiosis. (136) T. M. ALCORN,\* T. A. LUDKA, J. A. KASE, R. J. WIGENT, and P. CAMPBELL. Philadelphia Col. of Pharmacy and Sci., Philadelphia, Pa., and Beaver Col. Glenside, Pa.
- H230.** Cultural Conditions of Basic-pH-Decreased Expression of the Accessory Gene Regulator (*agr*) in *Staphylococcus aureus*. (138) L. B. REGASSA\* and M. J. BETLEY. Univ. of Wisconsin, Madison.
- H231.** Identification of a Periplasmic Protein Encoded by a pH- and Supercoiling-Sensitive Locus, *aniG*, of *Salmonella typhimurium*. (140) K. L. KAREM\* and J. W. FOSTER. Univ. of South Alabama, Col. of Med., Mobile.
- H232.** Induction of *Agrobacterium tumefaciens vir* Genes and Processing of T-DNA at Alkaline pH. (142) C. LIU, T. R. STECK,\* and S. B. GELVIN. Purdue Univ., W. Lafayette, Ind., and Univ. of North Carolina, Charlotte.
- H233.** A Novel Regulator Locus, *exaR*, Is Required for Aerobic Growth at Low pH in *Escherichia coli*. (144) M. LEONARDO, E. R. OLSON, † HERSH, D. P. CLARK, and J. L. SLONCZEWSKI.\* Southern Illinois Univ., Carbondale; Parke Davis, Ann Arbor, Mich.; and Kenyon Col., Gambier, Ohio.
- H234.** Cloning and Characterization of *dinH*, a Newly Identified SOS Gene. (146) L. A. GREGG-JOLLY,\* L. K. LEWIS, I. I. IRBINSKAS, and D. W. MOUNT. Dept. of Molecular and Cellular Biol., Univ. of Arizona, Tucson.
- H235.** The Gene *uspA* Encodes a Universal Stress Protein in *Escherichia coli*. (148) T. NYSTROM\* and F. C. NEIDHARDT. Univ. of Michigan, Ann Arbor.
- H236.** Characterization of *cspB*, an Inducible Cold Shock Gene, in *Bacillus subtilis*. (150) G. WILLIMSKY\* and M. A.

MARAHIEL. Inst. für Biochemie, FB Chemie, Philipps-Univ. Marburg, Marburg, Germany.

H237. Two 16-kDa Proteins Produced in Response to Heterologous Protein Expression in *Escherichia coli*. (152) S. P. ALLEN,\* J. O. POLAZZI, N. M. KIMACK, and A. M. EASTON. Monsanto Corporate Res., St. Louis, Mo.

### Session 206 (C). NONCULTURAL DETECTION OF PATHOGENS AND TOXINS

- C202. Evaluation of the Polymerase Chain Reaction To Detect *Mycobacterium tuberculosis* Directly in Clinical Specimens. (154) B. A. FORBES\* and K. E. HICKS. SUNY Health Sci. Ctr., Syracuse, N.Y.
- C203. Evaluation of GenProbe Pace II for Detection of *Chlamydia trachomatis* and *Neisseria gonorrhoeae* in Urogenital Specimens. (156) K. WESTFALL,\* S. SETTERQUIST, S. JONES, and J. BOWDRE. Univ. of North Carolina Hosp., Chapel Hill.
- C204. Probe Competition Assay for Confirmation of *Chlamydia trachomatis* and *Neisseria gonorrhoeae* in Urine Tested by the Gen-Probe PACE 2 Assays. (158) R. KELLER, W. LEBAR,\* C. JEMAL, and H. SCHUBINER. Delta Col., University Center, Mich.; Providence Hosp., Southfield, Mich.; and Wayne State Univ., Detroit, Mich.
- C205. Incidence of Direct Fluorescent Antibody-Negative DNA Probe-Positive *Neisseria gonorrhoeae* in a Sexually Transmitted Disease Clinic Population. (160) M. RAU, S. FLAGEOLLE, C. SIMMS, B. CALHOON, and J. L. BEEBE.\* Div. of Lab., Colorado Dept. of Health and Univ. Hosp., Denver.
- C206. Evaluation of a Combined Culture and Enzyme-Linked Immunosorbent Assay Format for Detecting *Neisseria gonorrhoeae* in Clinical Specimens. (162) C. A. CARLSON,\* R. CHAN, H. PALMER, C. R. PETER, L. SAMONS, and J. R. SCHWEBKE. Ortho Diagnostic Systems, Carpinteria, Calif.; San Diego County Publ. Health Lab., San Diego, Calif.; and Chicago Dept. of Health and Northwestern Univ., Chicago, Ill.
- C207. Specific Detection of *Neisseria gonorrhoeae* Using the Ligase Chain Reaction. (164) L. BIRKENMEYER,\* W. BRINGER, and A. ARMSTRONG. Abbott Lab., North Chicago, Ill.
- C208. Evaluation of the DNA Probe Direct Test for *Neisseria gonorrhoeae* on Treated Patients. (166) C. BUTLER,\* C. SCOTT, and R. HANKS. Fitzsimons Army Med. Ctr., Aurora, Colo.
- C209. Use of a Probe Competition Assay for Confirmation of *Neisseria gonorrhoeae* in Male Urine Samples. (168) R. KELLER,\* W. LEBAR, C. JEMAL, and M. BOTT. Delta Col., University Center, Mich.; Providence Hosp., Southfield, Mich.; and Gen-Probe, Inc., San Diego, Calif.
- C210. Comparison of DNA Probe, Monoclonal Direct Fluorescent Antibody, and Coagglutination Tests for Culture Confirmation of *Neisseria gonorrhoeae* in a Reference Laboratory. (170) P. B. HANNAH,\* S. FULTON, K. GALLIHER, and D. F. MOORE. Orange County Publ. Health Laboratory, Santa Ana, Calif.
- C211. Comparison of the Gen-Probe Hybridization Assay and Culture for Detection of *Neisseria gonorrhoeae* in Urogenital Specimens. (172) M. J. MILLER,\* P. COLONNA and S. BOVEY. UCLA Med. Ctr., Los Angeles, Calif.
- C212. Direct DNA Probe Assay for *Neisseria gonorrhoeae* in Pharyngeal and Rectal Specimens. (174) J. LEWIS,\* O. FAKILE, E. FOSS, G. LEGARZA, A. LESKYS, K. LOWE, and D. POWNING. CDC, Atlanta, Ga.; Clark County Health Dept., Las Vegas, Nev.; and Nevada State Health Dept., Reno.
- C213. Evaluation of the Gen-Probe Pace 2 System for the Detection of *Neisseria gonorrhoeae* in Urogenital Specimens.

(176) M. YOCUM,\* D. JONES, and B. FILBURN. Johns Hopkins Med. Inst., Baltimore, Md.

- C214. Preservation of Gonococcal DNA in Urine for Use in the Genetic Transformation Test. (178) L. ZUBRZYCKI. Temple Univ. Sch. of Med., Philadelphia, Pa.
- C215. Evaluation of a Rapid Oligonucleotide Test for Direct Detection of *Gardnerella vaginalis* and *Trichomonas vaginalis* from Vaginal Specimens. (180) S. L. HILLIER\* and A. M. BRISELDEN. Univ. of Washington, Seattle.
- C216. Rapid DNA Probe Test for the Simultaneous Detection of *Trichomonas vaginalis* and *Gardnerella vaginalis*. (182) K. DIX,\* J. LEHNER-FOURNIER, M. STAMM, R. M. GENDREAU, and R. KANEMOTO. MicroProbe Corp., Diagnostics Div., Bothell, Wash.
- C217. Comparison of Commercial Assays for the Detection of *Giardia lamblia*. (184) T. LAWRENCE,\* C. DRAWBAUGH, and B. WILCKE. Vermont Dept. of Health, Burlington.
- C218. Detection and Preliminary Identification of *Mycoplasma pneumoniae*. Using a Radiometric System. (186) W. NAUSCHUETZ and S. TREVINO.\* Brooke Army Med. Ctr., Fort Sam Houston, Tex.
- C219. Immunoenzyme Assay for Rapid Identification of Group B Streptococci in Obstetric Patients. (188) T. ARMER, P. CLARK,\* P. DUFF, and K. SARAVANOS. Dept. of Obstetrics and Gynecology, Univ. of Florida, Gainesville.
- C220. Use of the AccuProbe Culture Confirmation Test for the Direct Detection of Group B Streptococci in Cervical and Rectal Samples. (190) M. JORDAN,\* N. TIERNEY, F. MCDONALD, E. HOROWITZ, and W. LEBAR. Providence Hosp., Southfield, Mich.
- C221. Evaluation of Two Commercial Methods, Gram Stain, and Culture for the Detection of Group B *Streptococcus* from Cervical Specimens. (192) S. L. KLESPIES\* and A. J. HANSWORTH. Dept. of Microbiol./Immunology, Northeastern Ohio Univ. Col. of Med., Rootstown.
- C222. Evaluation of a Rapid Enzyme Immunoassay Test for Detection of Group B *Streptococcus* in Cervical and Vaginal Swabs. (194) J. R. GREEN\* and D. A. SCHWAB. Pathology Med. Lab., Scripps Mem. Hosp., San Diego, Calif.
- C223. Rapid Identification of Group B *Streptococcus* in Infant Urine Using the Icon Strep B Immunoassay Technique. (196) D. T. MANHOFF, J. EARL, and J. C. DUNN.\* Pennsylvania Hosp., Philadelphia.
- C224. Comparison of Direct Specimen Testing Utilizing Test-Pack Strep with Testing of Specimens following a 2-h Broth Enrichment. (198) P. BOURBEAU,\* B. HEITER, J. P. ANHALT, and D. NAUMOVITZ. Geisinger Med. Ctr., Danville, Pa.
- C225. Development of a Broth Media and DNA Probe Assay for Rapid Detection of *Streptococcus pyogenes* from Throat Swabs. (200) A. RAMBO, R. BRYAN, R. JOHNSON, and K. CLARK.\* Gen-Probe, Inc., San Diego, Calif.

### Session 207 (D). LIPOPOLYSACCHARIDES AND LIPOOLIGOSACCHARIDES OF GRAM-NEGATIVE PATHOGENS

- D144. Comparison of Lipopolysaccharide within Serotypes and Ribotypes of *Campylobacter jejuni* and *Campylobacter coli*. (202) D. C. BLAKE, JR., L. DETOLLA, and R. RUSSELL.\* Univ. of Maryland, Baltimore.
- D145. Molecular Analysis of the Gonococcal *rfuD* Homolog, Encoding ADP-1-Glycero-D-Mannoheptose Epimerase, a Gene Involved in Biosynthesis of Lipooligosaccharide in *Neisseria gonorrhoeae*. (204) E. S. DRAZEK,\* D. C. STEIN.

- and C. D. DEAL. Walter Reed Army Inst. of Res., Washington, D.C., and Univ. of Maryland, College Park.
- D146.** Chemical Inhibition of O-Layer Formation in *Escherichia coli*. (206) C. W. VERMEULEN,\* T. M. DICKENSON, M. J. DORSEY, D. C. FOOTE, B. HAAS, S. TINNELL, H. L. WILSON, and M. H. GREEN. Dept. of Biol., Col. of William and Mary, Williamsburg, Va., and Dept. of Biol., Univ. of California-San Diego, La Jolla.
- D147.** The *rfb* Gene Cluster of *Klebsiella pneumoniae* O1:K20 Is Responsible for the Expression of the D-Galactan I Side Chains of the Serotype O1 Lipopolysaccharide. (208) B. R. CLARKE and C. WHITFIELD.\* Dept. of Microbiol., Univ. of Guelph, Guelph, Ontario, Canada.
- D148.** Regulation of *rfa* and *rfb* in *Salmonella typhimurium* Using Bacterial Luciferase as a Reporter Gene. (210) J. J. MAURER. Dept. of Biol., Washington Univ., St. Louis, Mo.
- D149.** Molecular Characterization of a Gene Involved with A-Band Lipopolysaccharide Expression in *Pseudomonas aeruginosa*. (212) J. LIGHTFOOT\* and J. S. LAM. Dept. of Microbiol., Univ. of Guelph, Guelph, Ontario, Canada.
- D150.** Cloning and Surface Expression on *Escherichia coli* of *Pseudomonas aeruginosa* Lipopolysaccharide O Antigen. (214) J. B. GOLDBERG,\* K. HATANO, and G. B. PIER. Channing Lab., Brigham and Women's Hosp., Harvard Med. Sch., Boston, Mass.
- D151.** The Immunomodulatory Effect of *Yersinia enterocolitica* Lipopolysaccharides on the Murine Immune Response. (216) B. CASSIDY,\* M. LEE, and J. CHAN. California State Polytechnic Univ., Pomona.
- D152.** Immunological Analysis of the Lipooligosaccharide B Band of *Bordetella pertussis*. (218) D. MARTIN,\* M. S. PEPLER, E. OUIMETTE, and B. R. BRODEUR. Nat. Lab. for Immunology, LCDC, Ottawa, Ontario, Canada, and Dept. of Med. Microbiol. and Infect. Diseases, Univ. of Alberta, Edmonton, Alberta, Canada.
- D153.** Analysis of Protective and Nonprotective Monoclonal Antibodies Specific for *Bordetella pertussis* Lipooligosaccharide. (220) R. D. SHAHIN,\* J. HAMEL, B. BRODEUR, and M. F. LEEF. FDA, Bethesda, Md., and Lab. Ctr. for Disease Control, Ottawa, Ontario, Canada.
- D154.** Idiotypic Analysis of a Protective Anti-*Bordetella pertussis* Lipooligosaccharide Monoclonal Antibody. (222) J. HAMEL,\* C. CAZEAULT, and B. R. BRODEUR. Nat. Lab. for Immunology, Lab. Ctr. for Disease Control, Ottawa, Ontario, Canada.
- Candida tropicalis*. (230) H. H. GU,\* S. RUPKEY, M. HOWELL, and G. DEAN. Univ. of Cincinnati, Col. of Med., Cincinnati, Ohio.
- D159.** Genetic and Molecular Analysis of the Acetolysin Gene of a Non-Beta-Hemolytic, Pathogenic *Aeromonas trota* Strain (232) V. HUSSLEIN,\* J. PRYDE, W. NELSON, T. CHAKRABORTY, and S. W. JOSEPH. Dept. of Microbiol., Univ. of Maryland, College Park; Naval Med. Res. Inst., Bethesda, Md.; and GBF, Braunschweig, Germany.
- D160.** Cross-Reactivity of Antigens from Cell Extracts of *Corynebacterium pseudotuberculosis* and *Mycobacterium tuberculosis*. (234) C. E. BRAITHWAITE,\* E. E. SMITH, K. HOFFMAN, G. HOLSTAD, A. REINE, and J. SONGER. Cooperative Agricultural Res. Ctr., Prairie View A&M Univ., Prairie View, Tex.; Vitex Systems, Rockland, Mass.; Norwegian Col. of Vet. Med., Oslo, Norway; and Univ. of Arizona, Tucson.
- D161.** Comparative Studies of *Fusobacterium nucleatum* and *Fusobacterium ulcerans*. (236) K. GEORGE,\* B. TURNG, and W. FALKLER, JR. Dept. of Microbiol., Univ. of Maryland Dent. Sch., Baltimore.
- D162.** Adherence to, and Invasion of, Cultured Mammalian Cells by *Bordetella avium*. (238) L. V. COLLINS. Washington Univ., St. Louis, Mo.
- D163.** Cloning and Southern Analysis of Sequences from *Bordetella avium* Sharing Homology to the *Bordetella pertussis* *byg* Locus. (240) R. J. AMOS\* and G. H. LUGINBUHL. North Carolina State Univ., Raleigh.
- D164.** Characterization of Heat Shock Proteins in *Bordetella avium*. (242) S. ROCK\* and G. LUGINBUHL. North Carolina State Univ., Raleigh.
- D165.** Comparison of Fimbrial Serotype 2 Subunit Antigen Expression Levels in *Bordetella bronchiseptica* Strains. (244) E. H. BURNS, JR.,\* J. M. NORMAN, and D. A. BEMIS. Univ. of Tennessee, Knoxville.
- D166.** Spontaneous Loss of Adenylate Cyclase Activity: a Novel Type of Phase Variation in *Bordetella parapertussis*. (246) A. BEN-HAFSIA\* and M. S. PEPLER. Dept. of Med. Microbiol. and Infectious Diseases, Univ. of Alberta, Edmonton, Alberta, Canada, and Unité d'Ecologie Bactérienne, Inst. Pasteur, Paris, France.
- D167.** Cloning, Nucleotide Sequence, and Characterization of a Gene Encoding a Superoxide Dismutase from *Bordetella pertussis*. (248) D. DESHAZER,\* J. D. BANNAN, and R. L. FRIEDMAN. Univ. of Arizona, Tucson.
- D168.** Nonfimbrial Adhesins of *Bordetella pertussis* That Mimic Eukaryotic Adhesive Proteins. (250) J. H. HANNAH,\* E. LEININGER, A. BHARGAVA, and M. J. BRENNAN. Div. of Bacterial Products, Ctr. for Biologics Evaluation and Res., FDA, Bethesda, Md.
- D169.** Subtyping of *Legionella pneumophila* by Restriction Enzyme Analysis Using Pulsed-Field Gel Electrophoresis. (252) D. SCHOONMAKER\* and S. KONDRACKI. New York State Dept. of Health, Albany.
- D170.** New Penicillinase-Producing *Neisseria gonorrhoeae* Isolates with a 4.9-kb R-Plasmid in Puerto Rico: Phenotypic and Molecular Characterization. (254) R. SCHARBAAL,\* C. CADILIA, and L. J. TORRES-BAUZA. Univ. of Puerto Rico, Sch. of Med., San Juan, Puerto Rico.
- D171.** Electron Microscopy of Nocardial Invasion of the Murine Brain. (256) B. L. BEAMAN. Univ. of California-Davis Sch. of Med., Davis.
- D172.** Growth of *Nocardia asteroides* in Murine Astrocyte Cultures. (258) L. BEAMAN\* and B. L. BEAMAN. Univ. of California-Davis Sch. of Med., Davis.
- D173.** Rapid Method for DNA Extraction from *Nocardia*. (260) R. D. C. TORRES\* and H. ZLOTNIK. Univ. of Puerto Rico Sch. of Med., San Juan, Puerto Rico.

### Session 208 (D). WIDENING SPECTRUM OF VIRULENCE: EMERGING AND ESTABLISHED PATHOGENIC MICROORGANISMS

- D155.** Phenotypic and Genotypic Characterization of Clinically Significant Pink Gram-Negative Rods. (224) J. D. RIHS,\* D. J. BRENNER, R. E. WEAVER, A. G. STEIGERWALT, D. G. HOLLIS, G. L. GILARDI, and V. L. YU. VA Med. Ctr. and Univ. of Pittsburgh, Pittsburgh, Pa., and CDC, Atlanta, Ga.
- D156.** Cryptic Bacteria in Idiopathic Hematuria. (226) G. J. DOMINGUE,\* R. THOMAS, F. WALTERS, and P. M. HEIDGER, JR. Tulane Univ. Sch. of Med., New Orleans, La., and Univ. of Iowa Sch. of Med., Iowa City.
- D157.** Structural Analysis of the 29-kDa Surface Antigen of Pathogenic *Entamoeba histolytica*. (228) B. M. FLORES,\* M. A. STEIN, D. L. DIEDRICH, and B. E. TORIAN. Idaho State Univ., Pocatello.
- D158.** Cloning, Expression, and Characterization of Genes Encoding Subunits of the Vacuolar Proton Pump from

- D174.** Antigenic and DNA Restriction Analysis of *Nocardia brasiliensis* Strains. (262) L. A. HERNANDEZ\* and H. ZLOTNIK. Sch. of Med., Univ. of Puerto Rico, San Juan, Puerto Rico.
- D175.** *Rochalimaea henselae* sp. nov. Presenting as Painful Unilateral Adenopathy in Two Previously Healthy Patients. (264) M. T. WONG\* and M. J. DOLAN. Wilford Hall U.S. Air Force Med. Ctr., Lackland Air Force Base, Tex.
- D176.** Characterization of the *Yersinia pestis* *pgm* Locus. (266) J. D. FETHERSTON,\* P. SCHUETZE, and R. D. PERRY. Univ. of Kentucky, Lexington.
- D177.** Genomic Subtraction Identifies a Large Chromosomal Deletion in *Yersinia pestis* Associated with Pigmentation. (268) J. SHAO, D. STRAUSS, J. D. GOGUEN, S. K. OLKEN, F. M. AUSUBEL, and J. L. MICHEL.\* Channing Lab., Brigham and Women's Hosp., and Massachusetts Gen. Hosp., Boston.
- D178.** Effect of Lactoferrin on the Growth of Enterotoxigenic *Escherichia coli* in Mixed Culture with *Bifidobacterium* Species. (270) B. W. PETSCHOW,\* L. A. FARMER, and R. D. TALBOTT. Mead Johnson Res. Ctr., Evansville, Ind.

**Session 209 (Center for the History of Microbiology). Round Table**  
(Eligible for continuing education credit)

**SCARLET FEVER, SEPTIC SCARLET FEVER, TOXIC FEVER, AND THE STREPTOCOCCAL TOXIC SHOCK SYNDROME**

(Supported by a grant from Lederle Laboratories)

Friday, 11:00 A.M., Room 100

Convenor: JAMES A. POUPARD, ASM Archives, Ctr. for the History of Microbiology, Albin O. Kuhn Library, Univ. of Maryland, Catonsville

Scarlet fever is a disease of antiquity. The earliest descriptions are attributed to 10th century Arabian physicians, who referred to it as Alhamica. The term scarlatina, however, can be found in the works of Hippocrates as early as the 4th to 5th centuries. In 1858, three basic forms of scarlet fever were recognized by Wood; these are currently known as simple, septic, and toxic scarlet fever. In the late 1800s, Trousseau provided the first descriptions of acute scarlet fever and its chronic sequelae, such as poststreptococcal glomerulonephritis and rheumatic fever. The early 1900s saw the classic experiments of the Dicks in New York City, which established the role of soluble exotoxins in scarlet fever, using largely human experimentation. Throughout history there is ample evidence that the severity and mortality of scarlet fever has waxed and waned in a cyclical manner. Today, severe invasive forms of streptococcal infections are occurring worldwide, largely in young, healthy individuals. Clinically these infections, which have been called streptococcal toxic shock syndrome, are distinctly different from the various forms of scarlet fever, though the manifestations of each may be mediated, in part, by scarlatina toxin (pyrogenic exotoxin A, B, or C). On the basis of historical descriptions, manifestations of scarlatina toxin-producing streptococci are the consequences of an intimate relationship between streptococcal virulence factors and host cell responses. The ability of streptococcal products to induce cytokine production and their roles as superantigens are being recognized as important participants in the host-parasite relationship.

Participant: DENNIS STEVENS

**Session 210 (Committee on General Meeting Planning, BET). Seminar**  
(Eligible for continuing education credit)

**UPDATE '92 II**

Friday, Noon, Room 103

Convenors: JOHN CLAUSZ, Carroll Col., Waukesha, Wis., and JOHN M. LAMMERT, Gustavus Adolphus Col., St. Peter, Minn.

Update '92 in Bacterial Pathogenesis  
VINCENT A. FISCHETTI, Rockefeller Univ., New York, N.Y.

**Session 211 (C). Seminar**  
(Eligible for continuing education credit)

**BLOOD CULTURE PRACTICES**

Friday, 1:30 P.M., Ballroom IA

Convenors: JOHN A. WASHINGTON II, Cleveland Clin Cleveland, Ohio, and MARY GILCHRIST, Univ. of Cincinnati, Cincinnati, Ohio

Blood Culture Practices in the United States and Abroad  
JOHN A. WASHINGTON II, Cleveland Clin., Cleveland, Ohio

Drawing Blood for Culture: Needlesticks and Nuances  
FRANKLIN P. KOONTZ, Univ. of Iowa, Iowa City

Choosing Media for Blood Cultures  
DONALD L. JUNGKIND, Thomas Jefferson Univ., Philadelphia, Pa.

The Legal Perspective on Blood Culture Practices  
ROBERT J. DOCKERY, Becton Dickinson & Co., Franklin Lakes, N.J.

Comparative Studies of Instrumented Blood Culture Systems  
L. BARTH RELLER, Duke Univ. Med. Ctr., Durham, N.C.

**Session 212 (V, C). Seminar**  
(Eligible for continuing education credit)

**RAPID DIAGNOSIS: NEW PATHOGENS AND OLD**

Friday, 1:30 P.M., Room 10

Convenors: RICHARD KOHLER, Indiana Univ. Sch. of Med., Indianapolis, and RONALD J. HARBECK, Nat. Jewish Ctr., Denver, Colo.

Current Status of Rapid Diagnostic Tests for *Mycoplasma pneumoniae* Infections  
RAY RYAN, Univ. of Connecticut Sch. of Med., Farmington

Current Status of Rapid Diagnostic Tests for *Borrelia burgdorferi* Infections  
DAVID DORWARD, Rocky Mountain Lab., Nat. Inst. of Allergy and Infectious Diseases, Hamilton, Mont.

Current Status of Rapid Diagnostic Tests for *Chlamydia pneumoniae* Infections  
CHO-CHOU KUO, Univ. of Washington Sch. of Publ. Health, Seattle

Current Status of Rapid Diagnostic Tests for *Legionella* Infections  
RICHARD KOHLER, Indiana Sch. of Med., Indianapolis

Recent Advances in the Diagnosis of *Clostridium difficile*  
PETER GILLIGAN, Univ. of North Carolina Hosp., Chapel Hill

**Session 213 (H). Seminar**  
(Eligible for continuing education credit)

**NOVEL REGULATORY MECHANISMS IN  
BACILLUS SUBTILIS**

Friday, 1:30 P.M., Room 43

Convenors: ALAN D. GROSSMAN, MIT, Cambridge, Mass., and ABRAHAM L. SONENSHEIN, Tufts Univ., Boston, Mass.

Regulation of Nitrogen Metabolism in *Bacillus subtilis*  
A. L. SONENSHEIN, Tufts Univ. Med. Sch., Boston, Mass.

The *sigL* Gene of *Bacillus subtilis* Encodes an Equivalent of Sigma-54 of Gram-Negative Bacteria  
MICHEL DEBARBOUILLE, I. MARTIN-VERSTRAETE, F. KUNST, and G. RAPOPORT, Inst. Pasteur, Paris, France

The Competence Regulon of *Bacillus subtilis*  
DAVID DUBNAU, Publ. Health Res. Inst., New York, N.Y.

Gene Expression and Signal Transduction during Development in *Bacillus subtilis*  
ALAN D. GROSSMAN, MIT, Cambridge, Mass.

New Class of DNA Binding Proteins Involved in Properties of Spore DNA  
PETER SETLOW, Univ. of Connecticut Health Ctr., Farmington

**Session 214 (K)**

**FATTY ACID AND PHOSPHOLIPID  
METABOLISM**

Friday, 1:30 P.M., Room 37

Moderators: PAUL N. BLACK, Univ. of Tennessee, Memphis, and DAVID H. SHERMAN, Bioprocess Technology Inst., St. Paul, Minn.

1:30

**K113.** Identification of Genes That May Participate in Long-Chain Fatty Acid Transport in *Escherichia coli* Using *TnphoA*. A. AZIZAN\* and P. N. BLACK. Dept. of Biochemistry, Univ. of Tennessee, Memphis.

**K114.** Bacterial Fatty Acid Transport: Characterization of Carboxyl-Terminal Deletion Mutants in the *fadL* Gene of *Escherichia coli*. G. B. KUMAR\* and P. N. BLACK. Dept. of Biochemistry, Univ. of Tennessee, Memphis.

**K115.** Cloning and Characterization of the *fabD* Gene of *Escherichia coli*. K. MAGNUSON\* and J. E. CRONAN, JR. Univ. of Illinois, Urbana.

**K116.** Cloning, Sequencing, and Characterization of *Escherichia coli* Thioesterase I. H. CHO\* and J. E. CRONAN. Univ. of Illinois, Urbana.

2:30

**K117.** Cloning of the Fatty Acid Synthase Genes in *Streptomyces coelicolor*. P. PEREZ-GRAU\* and D. H. SHERMAN. Bioprocess Technology Inst. and Dept. of Microbiol., Univ. of Minnesota, St. Paul.

**K118.** In Vivo Labeling of *Vibrio harveyi* Fatty Acyl-Acyl Carrier Protein Intermediates with [<sup>3</sup>H]myristic Acid. Z. SHEN\* and D. M. BYERS. Dalhousie Univ., Halifax, Nova Scotia, Canada.

**K119.** Effect of Growth Temperature and Plasmid Removal on Fatty Acids of *Thermus*. K. NORDSTROM,\* M. VIRTALA, M. KARP, and S. LAAKSO. Helsinki Univ. of Technology, Espoo, Finland.

**K120.** Phospholipid Metabolism in *Escherichia coli* Subsequent to T4 Infection. E. KUTTER,\* V. ERYOMIN, D. HARPER, S. MAM, M. AWAYA, P. DURHAM, J. NORTH, T. WILLIAMS, and T. WHITE. Evergreen State Col., Olympia, Wash., and Bach Inst. of Biochemistry, Moscow, Russia.

3:30

**K121.** Cloning, Characterization, and Sequence Analysis of the *htrB* Multicopy Suppressor, *msbA*. M. KAROW\* and C. GEORGOPOULOS. Univ. of Utah, Salt Lake City.

**K122.** Membrane Composition of *Pseudomonas aeruginosa* Grown on Glucose or *n*-Hexadecane. R. SMITH\* and E. J. BROWN. Univ. of Alaska, Fairbanks.

**K123.** Cloning, Sequencing, and Expression of the *dae* Gene for D-Alanyl Lipoteichoic Acid Biosynthesis in *Lactobacillus casei*. M. P. HEATON\* and F. C. NEUHAUS. Dept. of Biochemistry, Molecular Biol. and Cell Biol., Northwestern Univ., Evanston, Ill.

**K124.** Effect of Cerulenin and Exogenous Fatty Acids on Sporulation of *Bacillus thuringiensis*. S. BAYKOUSHEVA\* and R. GRIGOROVA. Inst. of Microbiol., Bulgarian Academy of Sci., Sofia, Bulgaria.



**Session 215 (K). Seminar**  
(Eligible for continuing education credit)

**MICROBIAL ADAPTATION TO ENVIRONMENTAL STRESS**

Friday, 1:30 P.M., Room 41

Convenors: ROBERT E. MARQUIS, Univ. of Rochester, Rochester, N.Y., and WOLFGANG EPSTEIN, Univ. of Chicago, Chicago, Ill.

Adaptive Response of *Bacillus subtilis* to Nutrient Limitation  
JOHN P. MUELLER, Tufts Univ. Health Sci. Campus, Boston, Mass.

The Role of FNR in the Response of *Escherichia coli* to Oxygen Deprivation  
PATRICIA J. KILEY, Univ. of Wisconsin, Madison

The Adaptation of Extreme Alkaliphiles  
ARTHUR A. GUFFANTI, Mount Sinai Sch. of Med., Scarsdale, N.Y.

Acid Adaptations of Oral Bacteria  
ROBERT E. MARQUIS, Univ. of Rochester, Rochester, N.Y.

Ionic Responses to Osmotic Stress in *Escherichia coli*  
WOLFGANG EPSTEIN, Univ. of Chicago, Chicago, Ill.

**Session 216 (BET). Seminar**  
(Eligible for continuing education credit)

**DISCOVERING YOUR ROLE IN PRECOLLEGE SCIENCE EDUCATION**

Friday, 1:30 P.M., Room 103

Convenors: JOHN LENNOX, Pennsylvania State Univ., Altoona, and DAVID SCOTT, Univ. of Rochester, Rochester, N.Y.

ASM's Role in Precollege Science Education  
AMY CHANG, American Society for Microbiol., Washington, D.C.

Spreading the Word  
DAVID SCOTT, Univ. of Rochester, Rochester, N.Y.

Partnerships between ASM Members and Precollege Science Teachers  
JOE MCINERNEY, Biol. Sci. Curriculum Study, Colorado Springs, Colo.

Teaching "Science" with Microbiology  
ROBERT WILLIAMS, Baylor Col. of Med., Houston, Tex.

Student and Teacher Preparation and Science Fair Participation  
JOHN LAMMERT, Gustavus Adolphus Col., St. Peter, Minn.

A Strategy for Introducing Microbiology into Precollege Science Education  
SALLY DE GROOT, St. Petersburg Junior Col., St. Petersburg, Fla.

**Session 217 (A)**

**RESISTANCE TO QUINOLONES**

Friday, 1:30 P.M., Room 13

Moderators: N. H. GEORGOPADAKOU, Roche Res. Ctr., Nutley, N.J., and DAVID HOOPER, Massachusetts Gen. Hosp., Boston

1:30 Divisional Lecture  
(Eligible for continuing education credit)

Quinolone Resistance: Molecular Mechanisms and Clinical Relevance  
DAVID HOOPER, Massachusetts Gen. Hosp., Boston

2:30

A93. Cloning of *Pseudomonas aeruginosa gyrA* Gene by the Polymerase Chain Reaction Using Mixed Consensus Primers That also Amplify *Escherichia coli* and *Serratia marcescens gyrA* Genes. A. KUREISHI\* and L. E. BRYAN. Univ. of Calgary, Calgary, Alberta, Canada.

A94. Mechanisms of Quinolone Resistance in Clinical and Veterinary Isolates of *Salmonella*. D. J. GRIGGS,\* M. C. HALL, and L. J. V. PIDDOCK. Antimicrobial Agents Res. Group, Univ. of Birmingham Med. Sch., Birmingham, U.K.

A95. Molecular Epidemiology of Endemic Ciprofloxacin-Sensitive and -Resistant *Enterobacteriaceae*. Y. C. YEE,\* R. R. MUDER, M. HSIEH, and T. LEE. VA Med. Ctr., Pittsburgh, Pa.

A96. A Novel *gyrA* Point Mutation Confers Resistance to Fluoroquinolones but Not to Nalidixic Acid in *Escherichia coli*. E. CAMBAU,\* F. BORDON, E. COLLATZ, and L. GUTMANN. Ctr. Hosp. Univ. Broussais-Hôtel Dieu and Pitié-Salpêtrière Sch. of Med., Univ. of Paris VI, Paris, France.

3:30

A97. *gyrA* Analysis of Individual Methicillin-Resistant *Staphylococcus aureus* Strains, Each with Isolates at Various Levels of Quinolone Resistance, Selected In Vitro. L. R. PETERSON,\* C. E. FASCHING, and K. E. WILLARD. VA Med. Ctr. and Univ. of Minnesota, Minneapolis.

A98. Quinolone Resistance Mutation in *Staphylococcus aureus* Linked to *norA* and Conditions Affecting *norA*-Mediated Quinolone Efflux in *Escherichia coli*. M. TRUCKSIS,\* E. NG, M. BOZZA, and D. HOOPER. Massachusetts Gen. Hosp., Boston, and Univ. of Maryland, Baltimore.

A99. Supersusceptibility to Fluoroquinolones Due to Outer Membrane Protein H in *Pseudomonas aeruginosa*. M. YOUNG,\* M. BAINS, and R. E. W. HANCOCK. Univ. of British Columbia, Vancouver, British Columbia, Canada.

A100. Development of Resistance in *Staphylococcus aureus* Reduces the Postantibiotic Effect of Fluoroquinolones. R. J. DAVIDSON,\* G. G. ZHANEL, and D. J. HOBAN. Univ. of Manitoba, Winnipeg, Manitoba, Canada.

4:30

A101. Chromosomal Cleavage Patterns and Genetic Site of Quinolone Resistance in *Streptococcus pneumoniae*. J. B. COURTRIGHT,\* M. CASEY, and Y. CHENG. Marquette Univ., Milwaukee.

**A102.** Effects of Cephalosporin 3'-Quinolone Esters, Carbamates, and Tertiary Amines on Nucleoid Segregation in *Escherichia coli*. A. BERTASSO\* and N. H. GEORGOPAPADAKOU. Roche Res. Ctr., Nutley, N.J.



**Session 218 (E). Seminar**  
(Eligible for continuing education credit)

**ANTIMICROBIAL MECHANISMS AND  
EFFECTOR MOLECULES**

Friday, 1:30 P.M., Room 2

*Convenors:* BRUCE S. ZWILLING, Ohio State Univ., Columbus, and SHAWN J. GREEN, Walter Reed Res. Inst., Rockville, Md.

**Divisional Lecture**  
**Erwin Neter Memorial Lecture**

Antimicrobial Proteins of Human Neutrophil Granules  
JOHN K. SPITZNAGEL, Emory Univ. Sch. of Med., Atlanta, Ga.

Overview of Cytokine-Induced Nitric Oxide Synthesis from L-Arginine  
JOHN B. HIBBS, JR., Utah Sch. of Med. and VA Med. Ctr., Salt Lake City

In Vivo Regulation of Nitrogen Oxides by Cytokines  
SHAWN J. GREEN, Walter Reed Res. Inst., Rockville, Md.

Nitrogen Oxides as Effectors of Macrophage Cytotoxicity for Intracellular Pathogens  
DONALD L. GRANGER, Duke Univ. Med. Sch., Durham, N.C.

Nitric Oxide in *Salmonella* Immunity and Immunosuppression  
TOBY K. EISENSTEIN, Temple Univ. Sch. of Med., Philadelphia, Pa.

Regulation of the Oxidative Burst in Phagocytes  
JOHN M. ROBINSON, Ohio State Univ., Columbus

**Session 219 (F). Seminar**  
(Eligible for continuing education credit)

**CYTOKINES IN THE MYCOSES**

Friday, 1:30 P.M., Room 5

*Convenors:* JUNEANN MURPHY, Univ. of Oklahoma Health Sci. Ctr., Oklahoma City, and ELMER BRUMMER, Santa Clara Med. Ctr. and California Inst. for Med. Res., Stanford

Cytokine Production in Blastomycosis and Modulation of Host Response by Anti-Interleukin-4 in Paracoccidioidomycosis  
ELMER BRUMMER, Santa Clara Med. Ctr. and California Inst. for Med. Res., Stanford

Cytokines in Host Resistance to Experimental Histoplasmosis  
BETTY WU-HSIEH, UCLA, Los Angeles, Calif.

Monokine-Induced Modulation of Host Responses in Coccidioidomycosis

REBECCA A. COX, San Antonio State Chest Hosp., San Antonio, Tex.

Cytokines Involved in the Anticryptococcal Cell-Mediated Immune Response

JUNEANN W. MURPHY, Univ. of Oklahoma Health Sci. Ctr., Oklahoma City

Neutrophil Function against *Candida albicans*: Regulation by Cytokines

JULIE DJEU, Univ. of South Florida, Tampa

Cytokines in Prevention and Treatment of Invasive Candidiasis and Aspergillosis

THOMAS WALSH, NIH, Bethesda, Md.

**Session 220 (Q). Seminar**  
(Eligible for continuing education credit)

**INDOOR AIR AND BIOAEROSOLS**

Friday, 1:30 P.M., Room 21

*Convenors:* LINDA D. STETZENBACH, Univ. of Nevada, Las Vegas, and STEPHEN C. HERN, U.S. EPA, Las Vegas, Nev.

Indoor Air Microbiology in the 1990s: Breaking with Tradition  
GERARD N. STELMA, U.S. EPA, Cincinnati, Ohio

Legionellosis: a Case in Point  
JANE WONG, State of California Dept. of Health, Berkeley

Airborne Fungi and Indoor Air Quality  
CHIN S. YANG, Publ. Health Service, FEOH Region 3, Philadelphia, Pa.

The House Dust Mite: a Major Indoor Allergen  
JOAN RIVERS, ManTech Environmental Technology, Inc., Research Triangle Park, N.C.

Sick Building Syndrome: Chemicals and Endotoxin  
GLENDON R. MILLER, Wichita State Univ., Wichita, Kans.



**Session 221 (B, D). Seminar**  
(Eligible for continuing education credit)

**ATTACHING AND EFFACING AGENTS OF  
DIARRHEA**

Friday, 1:30 P.M., Room 16

*Convenors:* JAMES B. KAPER, Univ. of Maryland, Baltimore, and EDGAR C. BOEDEKER, Walter Reed Army Inst. of Res., Washington, D.C.

Epidemiology of Attaching and Effacing *Escherichia coli* Infections

ALEJANDRO CRAVIOTO, Facultad de Med., U.N.A.M., Mexico City, D.F., Mexico

- Pathology of Attaching and Effacing *Escherichia coli* Infections  
SAUL TZIPORI, Tufts Univ., North Grafton, Mass.
- Genetic Basis of Enteropathogenic *Escherichia coli* Pathogenesis  
MICHAEL DONNENBERG, Univ. of Maryland, Baltimore
- Intracellular Changes in Epithelial Cells Infected with Enteropathogenic *Escherichia coli*  
STUART KNUTTON, Inst. for Child Health, Birmingham, U.K.
- RDEC: a Rabbit Diarrheal Pathogen  
J. ROBERT CANTEY, VA Med. Ctr., Charleston, S.C.
- Enterohemorrhagic *Escherichia coli*  
PHILIP M. SHERMAN, Hosp. for Sick Children, Toronto, Ontario, Canada

### Session 222 (U)

#### CELL-MEDIATED IMMUNE RESPONSES IN MYCOBACTERIAL INFECTIONS

Friday, 1:30 P.M., Room 85

*Moderators:* TIMOTHY L. RATLIFF, Washington Univ., St. Louis, Mo., and ROBERT S. WALLIS, Case Western Reserve Univ., Cleveland, Ohio

1:30 Divisional Lecture  
(Eligible for continuing education credit)

Tuberculosis and Human Immunodeficiency Virus Infection: Interactions of an Ancient and a Modern Scourge  
JERROLD J. ELLNER, Case Western Reserve Univ., Cleveland, Ohio

2:30

U75. Isoform Switching of CD44 and CD45 on a Subset of CD4 T Cells during *Mycobacterium tuberculosis* Infection. J. P. GRIFFIN\* and I. M. ORME. Dept. of Microbiol., Colorado State Univ., Fort Collins.

U76. Cellular Immune Responses during *Mycobacterium paratuberculosis* Infection Are Mediated by Gamma-Delta NonT-NonB Lymphocytes, CD8<sup>+</sup> Contrasuppressor, and CD4<sup>+</sup> Helper Cells. R. J. CHIODINI\* and W. C. DAVIS. Brown Univ., Providence, R.I., and Washington State Univ., Pullman.

U77. Alteration of Phenotype Distribution in Human Lymphocytes Cultured with Monocyte/Macrophages Infected with Virulent *Mycobacterium tuberculosis*. B. JOHNSON,\* S. H. BLACK, and D. N. MCMURRAY. Texas A&M Univ., Col. of Med., College Station.

U78. Mycobacterial Induction of Activated Killer Cells. D. K. BLANCHARD,\* S. MCMILLEN, S. HOFFMAN, and J. Y. DJEU. Univ. of South Florida Col. of Med., Tampa.

3:30

U79. Intracellular Killing of *Mycobacterium kansasii* by Macrophages Stimulated with Recombinant Cytokines. L. E. BERMUDEZ and M. WU.\* Kuzell Inst., San Francisco, Calif.

U80. Role for NK and LAK Cells in Macrophage Turnover in Experimental Lepromatous Leprosy. L. GU\* and J. KRAHENBUHL. Immunology Res., G. W. Long Hansen's Disease Ctr., Carville, La.

U81. In Vitro Study of Macrophage Turnover in Leprosy. L. B. ADAMS,\* Y. FUKUTOMI, S. G. FRANZBLAU, and J. L. KRAHENBUHL. G. W. Long Hansen's Disease Ctr., Carville, La.

U82. Impact of Protein Malnutrition on the Passive Transfer of Immunity in Tuberculous Guinea Pigs. E. MAINALI\* and D. N. MCMURRAY. Texas A&M Univ. Col. of Med., College Station.

Session 223 (I). Seminar  
(Eligible for continuing education credit)

#### SENSORY/RESPONSE SYSTEMS FOR DIVERSE ENVIRONMENTAL SIGNALS

Friday, 1:30 P.M., Room 36

*Convenors:* EDWARD G. RUBY, USC, Los Angeles, Calif., and DOUGLAS BARTLETT, Univ. of California-San Diego, La Jolla

High-Pressure Signal Transduction, Acclimation, and Evolutionary Adaptation in Deep-Sea Bacteria  
DOUGLAS BARTLETT, Univ. of California-San Diego, La Jolla

Regulation of Swarmer Cell Differentiation in *Proteus* and *Vibrio*: a Bacterial Dr. Jekyll and Mr. Hyde  
ROBERT BELAS, Ctr. of Marine Biotechnology, Baltimore, Md.

Regulation of Iron Transport as a Component of Virulence in *Vibrio anguillarum*  
JORGE H. CROSA, Oregon Health Sci. Univ., Portland

Virulence Regulation and In Vivo Gene Expression in *Vibrio cholerae*  
JOHN J. MEKALANOS, Harvard Med. Sch., Boston, Mass.

Coordinated Responses during the Initiation of Light Organ Symbiosis by *Vibrio fischeri*  
EDWARD G. RUBY, USC, Los Angeles, Calif.

Regulation of *lux* Genes in *Vibrio fischeri*: a Genetic Light Switch  
E. PETER GREENBERG, Univ. of Iowa, Iowa City

Session 224 (S, T). Seminar  
(Eligible for continuing education credit)

#### MOLECULAR MECHANISMS OF VIRAL-INDUCED DISEASE

Friday, 1:30 P.M., Room 93

*Convenors:* MICHAEL LAI, USC Sch. of Med., Los Angeles, Calif., and KENNETH BERNS, Cornell Univ. Med. Col., New York, N.Y.

Molecular Mimicry and Coxsackievirus-Induced Myocarditis  
CHARLES GAUNTT, Univ. of Texas Health Sci. Ctr., San Antonio

Molecular Pathogenesis of Adenovirus Pneumonia  
HAROLD GINSBERG, Columbia Univ., Col. of Physicians  
and Surgeons, New York, N.Y.

Role and Function of Cell-Mediated Immunity in Viral Disease  
J. LINDSAY WHITTON, Scripps Res. Inst., La Jolla, Calif.

Pathobiology of Human Papillomaviruses  
TOM BROKER, Univ. of Rochester Sch. of Med., Rochester,  
N.Y.

**Session 225 (D). Seminar**  
(Eligible for continuing education credit)

**REGULATION AND FUNCTION OF  
BACTERIAL CYTOLYTIC TOXINS**

Friday, 1:30 P.M., Room 1

Convenors: ROD WELCH, Univ. of Wisconsin, Madison, and  
DAVID KOLODRUBETZ, Univ. of Texas Health Sci. Ctr.,  
San Antonio

Regulation and Structure Analyses of Listeriolysin O  
PASCALE COSSART, Inst. Pasteur, Paris, France

Membrane-Active Toxins of Clostridia  
ROD TWETEN, Univ. of Oklahoma Sch. of Med., Oklahoma  
City

Two-Component Cytolysins of Gram-Positive Bacteria  
MIKE GILMORE, Univ. of Oklahoma, Oklahoma City

Biochemistry and Regulation of Nonhemolytic and Hemolytic  
Phospholipase C's of *Pseudomonas aeruginosa*  
MICHAEL VASIL, Univ. of Colorado Health Sci. Ctr.,  
Denver

Regulation of Transport and Secretion of Leukotoxin from  
*Actinobacillus actinomycetemcomitans*  
DAVID KOLODRUBETZ, Univ. of Texas Health Sci. Ctr.,  
San Antonio

Identification of Different Functional Domains of the *Escherichia*  
*coli* Hemolysin  
ROD WELCH, Univ. of Wisconsin Sch. of Med., Madison

**Session 226 (PSAB). Round Table**  
(Eligible for continuing education credit)

**MICROBIOLOGISTS AND MENTORS:  
RESPONSIBILITIES AND REWARDS**

Friday, 1:30 P.M., Room 80

Convenors: SARA W. ROTHMAN, Walter Reed Army Inst. of  
Res., Washington, D.C., and ANNE MORRIS HOOKE,  
Miami Univ., Oxford, Ohio

Mentoring is much more than scientific advising, and scientists  
need mentors, more than one. Indeed, scientists need mentors at  
each stage and for every aspect of their careers. Mentors in  
college advise on careers and choice of graduate or professional  
school and on academic and other attributes prized by admissions

committees. Mentors in graduate school—the “typical” mentor  
we think of when the term is used—train students in all aspects of  
experimental science, from the scientific method through technical  
design and performance of experiments, data analysis and  
interpretation, data presentation (written and oral), and scientific  
ethics, to postdoctoral applications and other career decisions.  
Junior and senior members of the profession, whether in  
academic, clinical, industrial, or educational settings in either the  
government or private sector, need mentors to advise and assist  
them in all facets of career development. The members of the  
round table will focus on three topics: the responsibilities of  
scientific mentors, the importance of identifying appropriate  
mentors in different career situations, and specific problems  
which women may face with or without suitable mentors. The  
audience will be invited to raise other mentoring issues of concern  
to women in the profession.

Participants: CAROLYN DEAL, MARCIA MOODY, ANNE  
MORRIS HOOKE, DONNA SUCHMANN, and MARI-  
LYN ROBERTS

**Session 227 (G)**

**MOLLICUTES: CELL SURFACES,  
IMMUNOLOGY, AND HOST INTERACTION**

Friday, 1:30 P.M., Room 19

Moderators: RICARDO ROSENBUSCH, Iowa State Univ.,  
Ames, and SUZANNE E. ROSS, Univ. of Alabama, Birming-  
ham

**1:30 Divisional Lecture**  
(Eligible for continuing education credit)

The Mycoplasma Superantigen MAM: Mechanisms and Signifi-  
cance of Polyclonal T and B Lymphocyte Activation  
BARRY C. COLE, Univ. of Utah Sch. of Med., Salt Lake City

2:30

G27. Sex Differences in Susceptibility to *Mycoplasma pulmonis*-  
Induced Respiratory Disease in C<sub>3</sub>H/HeN Mice. A. YAN-  
CEY,\* J. W. SIMECKA, H. L. WATSON, S. ROSS, and G.  
H. CASSELL. Dept. of Microbiol., Univ. of Alabama, Bir-  
mingham.

G28. Effect of Four Diets on Arthritis Produced by *Mycoplasma*  
*pneumoniae*, *Mycoplasma pulmonis*, and *Mycoplasma arthriti-*  
*dis* in Rabbits. C. GIL,\* L. CEDILLO, D. MARIN, S.  
GIONO, and A. YANEZ. Univ. Autónoma de Puebla, Puebla,  
Puebla, Mexico, and Inst. Politécnico Nacional, Prol., Carpio y  
Plan de Ayala, Mexico.

G29. Antibody Provides Protection from *Ureaplasma urealyti-*  
*cum* Respiratory Disease in Newborn Mice. G. KELLER,\* D.  
CROUSE, and G. CASSELL. Univ. of Alabama, Birmingham.

G30. Characterization of Receptors for *Mycoplasma hyopneu-*  
*moniae* Adherence to Swine Respiratory Epithelium. Q.  
ZHANG,\* T. YOUNG, and R. F. ROSS. Iowa State Univ.,  
Ames.

3:30

G31. Spiroplasma-Induced Chromosome Anomalies in Infected  
Eukaryotic Cells. F. O. BASTIAN,\* W. M. HOLBROOK,  
and W. M. CLEMENT. Univ. of South Alabama, Mobile.

FRIDAY

- G32.** High-Frequency Antigenic and Phase Variation of *Mycoplasma fermentans* Membrane Lipoproteins Generating Diverse Surface Mosaics for Host Interactions. P. THEISS,\* M. KIM, and K. WISE. Univ. of Missouri, Columbia.
- G33.** Development and Use of Monoclonal Antibodies Specific for *Mycoplasma gallisepticum*. M. F. SLAVIK,\* W.-W. CAO, and R.-F. WANG. Dept. of Animal and Poultry Sci., Univ. of Arkansas, Fayetteville.
- G34.** Effect of Specific Antibody on Antigen Size Variation and Adherence of *Ureaplasma urealyticum*. X. ZHENG,\* M. KEMPF, G. CASSELL, and H. WATSON. Univ. of Alabama, Birmingham.
- 4:30**
- G35.** Characterization of Surface Protein of *Mycoplasma fermentans* and in Other Mycoplasma Species. L. LAMBERT,\* C. ZUHUA, H. L. WATSON, and G. H. CASSELL. Dept. of Microbiol., Univ. of Alabama, Birmingham.

### Session 228 (Q)

#### MICROORGANISMS IN SHELLFISH AND SHELLFISH-RAISING WATERS

Friday, 1:30 P.M., Room 33

*Moderators:* R. D. ELLENDER, Univ. of Southern Mississippi, Hattiesburg, and CHARLES A. KAYSNER, U.S. FDA, Bothell, Wash.

1:30

- Q251.** Detection of Genus *Salmonella* by Using Polymerase Chain Reaction. A. K. BEJ,\* M. H. MAHBUBANI, and R. M. ATLAS. Dept. of Biol., Univ. of Alabama, Birmingham, and Dept. of Biol., Univ. of Louisville, Louisville, Ky.
- Q252.** Development of a T-7 Polymerase Amplification Assay for the Detection of Enteric Viruses in Water and Shellfish. P. M. REGAN\* and A. B. MARGOLIN. Univ. of New Hampshire, Durham, and FDA/WEAC, Winchester, Mass.
- Q253.** Do Cargo Ships Play a Role in the Dissemination of *Vibrio cholerae*? S. A. MCCARTHY,\* J. GAINES, R. M. MCPHEARSON, and A. M. GUARINO. Div. of Seafood Res., FDA, Dauphin Island, Ala., and Northeast Technological Services Unit, North Kingstown, R.I.
- Q254.** Detection of *Vibrio vulnificus* Isolates from the Great Bay Estuary Using Polymerase Chain Reaction. S. H. JONES\* and K. R. O'NEILL. Univ. of New Hampshire, Durham, and Univ. of Maryland, College Park.

2:30

- Q255.** Pathogenic Vibrios in the Fish Intestine. A. DEPAOLA,\* G. CAPERS, and M. MOTES. Div. of Seafood Res., FDA, Dauphin Island, Ala.
- Q256.** Immunoclassification of Wastewater Particulates in Shellfish-Growing Waters. N. GRIFFIS,\* A. BARRILLEAUX, B. MIDDLEBROOKS, and R. ELLENDER. Univ. of Southern Mississippi, Hattiesburg.
- Q257.** *Clostridium perfringens* Provides the Only Reliable Measure of Human Contamination in the Marine Environment. W. BURKHARDT III\* and W. D. WATKINS. U.S. FDA, N. Kingstown, R.I.

- Q258.** Incidence of *Vibrio vulnificus* in the Chesapeake Bay. A. C. WRIGHT,\* Y.-F. GUO, J. B. CHRISTY, J. A. JOHNSON, U. HAYAT, R. T. HILL, and R. R. COLWELL. Univ. of Maryland Med. Sch. and Ctr. of Marine Biotechnology, Baltimore.

3:30

- Q259.** *Vibrio cholerae* Surveillance in Sewage in Mexico. L. GUTIERREZ,\* G. BOLANOS, S. GIONO, A. DEL RIO, and J. L. VALDESPINO. Nat. Inst. of Epidemiological Diagnosis and Reference, Mexico, D.F., and ENCB-IPN, Mexico.
- Q260.** Macromolecular Synthesis in *Vibrio vulnificus* during Entry into the Nonculturable and Starvation States. D. MORTON,\* M. EL-JANNE, and J. OLIVER. Univ. of North Carolina, Charlotte.

### Session 229 (BET). Seminar (Eligible for continuing education credit)

#### USING HISTORY TO ENRICH THE TEACHING OF MICROBIOLOGY

Friday, 1:30 P.M., Room 95

*Convenors:* ROBERT I. KRASNER, Providence Col., Providence, R.I., and JAMES A. POUPARD, SmithKline Beecham Pharmaceuticals, King of Prussia, Pa.

Readily Available Sources in the History of Microbiology  
JAMES A. POUPARD, SmithKline Beecham Pharmaceuticals, King of Prussia, Pa.

A History Lesson at the Pasteur Institute  
ROBERT I. KRASNER, Providence Col., Providence, R.I.

Shibasaburo Kitasato: a Place in History  
AKIRA GHODA, Kitasato Inst., Tokyo, Japan

Techniques Historians Employ To Motivate Passive Students  
LINDA A. MILLER, Holy Redeemer Hosp. and Med. Ctr., Meadowbrook, Pa.

### Session 230 (P). Seminar (Eligible for continuing education credit)

#### NUCLEIC ACID AMPLIFICATION AND OTHER INNOVATIVE DETECTION SYSTEMS

Friday, 1:30 P.M., Room 97

*Convenors:* PETER FENG, FDA, Washington, D.C., and WALTER E. HILL, FDA, Bothell, Wash.

Polymerase Chain Reaction Application for Detecting Microorganisms in Foods  
RON ATLAS, Univ. of Louisville, Louisville, Ky.

## Nucleic Acid Sequence-Based Amplification for Detection of Food-Borne Bacteria

MIKE SVEDA, BRYAN BUTMAN, REBECCA DURHAM, and BONNIE SWERDLOW, Organon-Teknika/Biotechnology Res. Inst., Rockville, MD.

## Single Nucleotide Disease Detection Using Ligase Chain Reaction

FRANCIS BARINI, Cornell Univ. Med. Col., New York, N.Y.

## Detection of Pathogens Using Q-beta Replicase-Mediated Amplification of Hybridization Probes

SANJAY TYAGI, Publ. Health Res. Inst., New York, N.Y.

Detection of *Salmonella* by Transduction of Ice Nucleation Gene

PAUL WOLBER, DNA Plant Technologies, Oakland, Calif.

## Biosensors: Technology, Problems, and Future Prospects

RUTH FIRSTENBERG-EDEN, Difco Res. & Development, Ann Arbor, Mich.

## Session 231 (N). Seminar

(Eligible for continuing education credit)

## MOLECULAR APPROACHES IN SUBSURFACE MICROBIAL ECOLOGY

Friday, 1:30 P.M., Room 82

Convenors: JAMES K. FREDRICKSON, Pacific Northwest Lab., Richland, Wash., and DAVID L. BALKWILL, Florida State Univ., Tallahassee

## Molecular Phylogeny of Subsurface Bacteria

ROBERT REEVES and DAVID BALKWILL, Florida State Univ., Tallahassee

## Molecular Studies for Phylogenetic Analysis of Subsurface Microorganisms Using 16S rRNA-Directed Probes

SANDRA NIERZWICKI-BAUER, Rensselaer Polytechnic Inst., Troy, N.Y.

## Evaluation of Microbial Survival in the Subsurface

MARY LOU KRUMME, SUZANNE THIEM, RICHARD SMITH, and JAMES TIEDJE, Michigan State Univ., E. Lansing

BTEX Metabolism by *Pseudomonas pickettii* and Other Bacteria from Subsurface Anoxic Environments

RONALD OLSEN, Univ. of Michigan, Ann Arbor

## Recruitment and Expression of Cloned Biodegradative Genes in Subsurface Bacteria

FRED BROCKMAN and MARGARET ROMINE, Pacific Northwest Lab., Richland, Wash.

## SOLVENTOGENIC MICROBES: NATURAL AND ENGINEERED

Friday, 1:30 P.M., Room 87

Moderators: R. SHANE GOLD, Univ. of Nebraska, Lincoln, and KARL WALTER, Northwestern Univ., Evanston, Ill.

1:30

O61. Growth and Fermentation Product Levels in Complex Media by *Clostridium ljungdahlii* PETC. M. L. DOYLE\* and D. E. TALBURT, Univ. of Arkansas, Fayetteville.

O62. Ethanol Tolerance and Carbohydrate Metabolism in Lactobacilli. R. S. GOLD,\* M. M. MEAGHER, R. W. HUTKINS, and T. CONWAY, Univ. of Nebraska, Lincoln.

O63. Ethanol Production in *Salmonella typhimurium* LT2 Wild-Type and Anaerobic Mutants Containing *pdc* (Pyruvate Decarboxylase) Gene of *Zymomonas mobilis*. H. S. KWAN,\* H. C. LEUNG, and S. C. CHENG, Chinese Univ. of Hong Kong, Shatin, N.T., and Hong Kong, and Hong Kong Polytechnic, Kowloon, Hong Kong.

O64. Molecular Characterization of Two *Clostridium acetobutylicum* Butanol Dehydrogenase Isozymes. K. WALTER\* and E. PAPOUTSAKIS, Northwestern Univ., Evanston, Ill.

2:30

O65. Use of *Bacillus subtilis* Phage  $\phi$ T3 Methylase To Protect Plasmids against Restriction upon Transformation of *Clostridium acetobutylicum* ATCC 824. L. MERMELSTEIN\* and E. T. PAPOUTSAKIS, Northwestern Univ., Evanston, Ill.

O66. A Transcriptional Regulator Gene Upstream from the *adh* Gene of *Clostridium beijerinckii* NRRL B593: Cloning and Sequence Analysis. M. RIFAAT\* and J.-S. CHEN, Virginia Polytechnic Inst. and State Univ., Blacksburg.

O67. Transformation of *Clostridium acetobutylicum* NCIB 6444 with a Chimeric *C. acetobutylicum*-*Escherichia coli* Plasmid. D. MATTSSON,\* T. RAST, and P. ROGERS, Univ. of Minnesota, Minneapolis.

O68. Factors Affecting Efficiency of Ethanol Production by Recombinant *Escherichia coli* from Lactose and Whey. F. ALTERTHUM,\* M. L. CARVALHAL, D. F. TAKAHASHI, and M. C. M. RODRIGUES, Inst. de Ciências Biomédicas da Univ. de São Paulo, São Paulo, Brazil.

3:30

O69. Genetic Engineering of Novel Bacterial Recombinants Which Degrade Plant Polysaccharides and Produce Ethanol. D. S. BEALL,\* G. BURCHHARDT, W. V. GUIMARAES, and B. E. WOOD, Univ. of Florida, Gainesville.

**Session 233 (M). Seminar**  
(Eligible for continuing education credit)

**RNA BACTERIOPHAGES REVISITED:  
CORRELATION OF GENOME STRUCTURE  
AND FUNCTION**

Friday, 1:30 P.M., Room 38

Convenors: DONALD MILLS, SUNY Health Sci. Ctr., Brooklyn, N.Y., and ANN JACOBSON, SUNY at Stony Brook, Stony Brook, N.Y.

RNA Genome's Dilemma: Fold as You Please, but Fold You Must!!

DONALD MILLS, SUNY Health Sci. Ctr., Brooklyn, N.Y.

Coliphage QB: Large Structural Domains and Their Potential Role in Gene Expression

ANN JACOBSON, SUNY at Stony Brook, Stony Brook, N.Y.

**Divisional Lecture**

RNA Secondary Structure: Control of Gene Expression

JAN VAN DUIN, State Univ. of Leiden, Leiden, The Netherlands

Mutation, Expression, and Function of RNA Phage Replicases

PAT SHAKLEE, Texas Col. of Osteopathic Med., Univ. of North Texas, Fort Worth

Three-Dimensional Analysis of the Translational Repressor of Phage MS2

KATHRINE ELY, La Jolla Cancer Res. Fndn., La Jolla, Calif.

**POSTER SESSIONS**

Friday, 1:30-3:00 P.M., Exhibit Hall C

(Board numbers in parentheses)

**Session 234 (F). CLINICAL MYCOLOGY  
LABORATORY AND ANTIFUNGAL THERAPY**

**F81.** Cryptococcal Antigen Detection from Urine in AIDS Patients. (001) K. CHAPIN-ROBERTSON,\* C. BECHTEL, S. WAYCOTT, and S. C. EDBERG. Yale Univ. Sch. of Med., New Haven, Conn.

**F82.** Comparison of an Enzyme Immunoassay and Latex Agglutination for the Detection of Cryptococcal Antigens. (003) J. A. OWEN, K. G. ROGLES,\* and B. H. MINSHEW. SmithKline Beecham Clin. Lab., St. Louis, Mo.

**F83.** Multilaboratory Evaluation of the Enzyme Immunoassay Test in Detection of Cryptococcal Antigen. (005) A. S. SEKHON,\* A. K. GARG, L. KAUFMAN, G. S. KOBAYASHI, and Z. HAMIR. Nat. Ctr. for Human Mycotic Diseases, Provincial Lab. for Publ. Health, Edmonton, Alberta, Canada; CDC, Atlanta, Ga.; and Washington Univ. Sch. of Med., St. Louis, Mo.

**F84.** Comparison of the MicroScan Rapid Yeast Identification Panels, the Vitek Yeast Biochemical Cards, and the API 20C Clinical Yeast System. (007) D. L. RIDDLE,\* G. HALL, O. GIGER, L. MILLER, and G. WOODS. Med. Col. of

Pennsylvania, Philadelphia, and Cleveland Clin. Fndn., Cleveland, Ohio.

**F85.** Evaluation of Fungal Culture Media Using the Isolator and Septi-Chek Fungal Blood Culture Systems for the Recovery of Yeast and Filamentous Fungi from Blood. (009) I. GUERRA-ROMERO,\* C. E. MUSIAL, D. M. ILSTRUP, C. D. HORSTMEIER, and G. D. ROBERTS. Sect. of Clin. Microbiol. and Sect. of Biostatistics, Mayo Clin. and Mayo Fndn., Rochester, Minn.

**F86.** Rapidly Induced Germination as a Laboratory Aid in Differentiation of Dematiaceous Moulds. (011) J. W. MARTIN,\* D. A. MCGOUGH, and M. G. RINALDI. Brooke Army Med. Ctr., Ft. Sam Houston, Tex., and Univ. of Texas Health Sci. Ctr. and Audie Murphy Mem. Veterans' Hosp., San Antonio.

**F87.** Dematiaceous Fungi as a Cause of Disease at a Large Urban Hospital, 1987-1991. (013) S. ROSSMANN,\* P. CERNOCH, and J. DAVIS. Methodist Hosp. and Baylor Col. of Med., Houston, Tex.

**F88.** Recovery of Mycobacteria in the Mycology Laboratory by Using Routine Techniques. (015) N. DUNNELL,\* A. GATSON, L. PASARELL, L. MARTINEZ, M. EL-ZAATARI, and M. R. MCGINNIS. Dept. of Pathology, Univ. of Texas Med. Branch, Galveston.

**F89.** Identification of *Aspergillus* sp.: a Comparison of Culture, Cytology, and Surgical Pathology Results. (017) D. FISCHLER, M. STOLER, C. NUNEZ, and G. HALL.\* Cleveland Clin. Fndn., Cleveland, Ohio.

**F90.** *Candida lusitanae* Confirmed by a Simple Test. (019) R. C. SUMMERBELL. Lab. Services Branch, Ontario Ministry of Health, Toronto, Ontario, Canada.

**F91.** Comparison of Broth Macrodilution and Microdilution Antifungal Susceptibility Tests for Filamentous Fungi. (021) A. ESPINEL-INGROFF\* and T. M. KERKERING. Med. Col. of Virginia/Virginia Commonwealth Univ., Richmond.

**F92.** Antifungal Susceptibility Testing and Strain Phenotype Differentiation of *Candida* Species by Relative Growth in Quantitative Microcultures. (023) F. C. ODDS. Janssen Res. Fndn., Beerse, Belgium.

**F93.** Antifungal Drug Susceptibility Testing of *Candida* Species Using an "All-Fungal" Chemiluminescent DNA Probe. (025) G. P. THOMPSON,\* L. FREDERICK, L. STOCKMAN, and G. D. ROBERTS. Mayo Clin. and Mayo Fndn., Rochester, Minn.

**F94.** In Vitro Comparative Evaluations of the Postantifungal Effect of Cisapentacin and Pradimicin on *Candida albicans*. (027) G. SCALARONE,\* Y. MIKAMI, N. KURITA, K. YAZAWA, and M. MIYAJI. Idaho State Univ., Pocatello, and Res. Ctr. for Pathogenic Fungi and Microbial Toxicoses, Chiba Univ., Chiba, Japan.

**F95.** Stability and Sterility of Intravenous Fluconazole in Glass Units and Plastic Vialflex Containers. (029) A. W. FOTHERGILL,\* D. A. MCGOUGH, and M. G. RINALDI. Univ. of Texas Health Sci. Ctr. and Audie L. Murphy Mem. Veterans' Hosp., San Antonio.

**F96.** Efficacy of Amphotericin B Lipid Complex in the Treatment of Experimental Fungal Infections. (031) J. R. PERFECT\* and K. A. WRIGHT. Duke Univ. Med. Ctr., Durham, N.C.

**F97.** Efficacy of Topical SP-1101 in a Rat *Candida albicans* Model of Vaginitis. (033) S. ALLEN,\* K. SORENSEN, and I. MEYERSON. Utah State Univ., Logan, and Shaman Pharmaceuticals, Inc., San Carlos, Calif.

**F98.** Automatic Antifungal Activity Analyzing System. II. Comparison of MIC of Antimycotics by Different Assay Methods. (035) K. OH, H. MATSUOKA,\* Y. NEMOTO, O. SUMITA, K. TAKATORI, and H. KURATA. Tokyo Univ. Agricul. Technol., Bio-Giken Inc., and Tokyo Kambikyon

### Session 235 (L). EMERGENCE OF RESISTANT PATHOGENS; CATHETER-RELATED INFECTIONS

- L26. Correlation of Ceftazidime Use and an Outbreak of Plasmid-Mediated Resistance among *Enterobacteriaceae*. (037) R. B. CAREY, C. O. COSTAS,\* A. SUNDBERG, D. MIYASHIRO, and J. P. QUINN. St. Francis Hosp., Evanston, Ill., and Michael Reese Hosp., Chicago, Ill.
- I27. Outbreak of Multiresistant *Enterobacter cloacae* Bacteremias in a Mexican Hospital. (039) S. LAZO DE LA VEGA,\* C. GIRAUD, J. M. RUIZ, and L. F. PEREZ. Hosp. Central Ignacio Morones P., San Luis Potosi, Mexico.
- L28. Failure of Oral Doxycycline To Eradicate Fecal Carriage of Vancomycin-Resistant *Enterococcus faecium*. (041) P. LINDEN,\* A. W. PASCULLE, R. MANEZ, D. KRAMER, M. MARTIN, and T. STARZL. Univ. of Pittsburgh Med. Ctr., Pittsburgh, Pa.
- L29. Clinical Features of Vancomycin-Resistant Enterococcal Bacteremia. (043) J. W. SANDERS,\* J. W. FROGGATT, J. MCLAUGHLIN, S. HARRINGTON, and J. DICK. Johns Hopkins Univ., Baltimore, Md.
- L30. Trends in Gram-Positive Bloodstream Organism Resistance: a 7-Year Audit of Twelve Drugs and Use Data at a Large University Medical Center. (045) J. ENA,\* A. HOUSTON, R. JONES, and R. WENZEL. Univ. of Iowa Col. of Med., Iowa City.
- I31. Antimicrobial Resistance among Nonfermenting Gram-Negative Aerobes Isolated from Intensive Care Unit Patients to Ciprofloxacin and Imipenem. (047) A. LOPEZ,\* E. HENSEL, R. MATURIN, and J. R. LENTINO. Hines VA Hosp., Hines, Ill.
- L32. *Candida rugosa* Fungemia and Colonization Associated with Topical Nystatin Use on a Burn Ward. (049) M. DUBE,\* P. HESELTINE, S. EVANS, and B. ZAWACKI. USC Sch. of Med. and Los Angeles County-USC Med. Ctr., Los Angeles, Calif.
- L33. Infectious Complications of Groshong versus Subcutaneous Port Long-Term Indwelling Central Venous Catheters. (051) J. PIPER,\* K. AMACHER, E. BIRD, and K. RYAN. David Grant U.S. Air Force Med. Ctr., Travis Air Force Base, Calif.
- L34. Evaluation of Line-Associated Sepsis in Pediatric Patients by Quantitative Blood Cultures. (053) R. FADER,\* S. BARBOUR, J. KOPEK, D. SANFILIPPO, J. FAHNER, D. FREYER, and R. HACKBARTH. Dept. of Pediatrics and Microbiol., Butterworth Hosp., Grand Rapids, Mich.
- L35. Incidence of Infection in Totally Implantable Venous Access Systems in AIDS. (055) D. KARAM-SARKIS,\* M. LERESCHE, H. JOHANET, D. SALMON, G. BENHAMOU, and E. BERGOGNE-BEREZIN. Bichat-Cl. Bernard Hosp., Paris, France.
- L36. Microbiology of Vascular Catheter Colonization in a Prospective Study of Catheter-Associated Infection. (057) N. KHARDORI,\* S. NORLIN, A. CHOPRA, and S. RABINOVICH. Southern Illinois Univ. Sch. of Med., Springfield.
- L37. Bacteremia in Cancer Patients: Critical Assessment of CDC Criteria for Significant Bacteremia. (059) D. COULIQUOUD, P. VAN DER AUWERA,\* and THE CEMIC (FRENCH-BELGIAN INFECT. DIS. IN ONCOLOGY STUDY CLUB). Ctr. Léon Bérard, Lyon, France, and Inst. J. Bordet, Brussels, Belgium.

### Session 236 (C). ANTIMICROBIAL SUSCEPTIBILITY TESTING: EVALUATIONS OF NEW DRUGS, NOVEL APPLICATIONS, AND EXPERIMENTAL TECHNIQUES

- C226. Rapid and Simple Antiviral Sensitivity Testing of Cytomegalovirus (061) L-F. TSENG,\* M. H. KAPLAN, F. X. BIONDO, and S. M. LIPSON. North Shore Univ. Hosp.-Cornell Univ. Med. Col., Manhasset, N.Y., and Long Island Univ., Brookville, N.Y.
- C227. Assessment of In Vitro Susceptibility of Cytomegalovirus to Ganciclovir and Foscarnet in AIDS Patients with Retinitis. (063) M. FORMAN,\* J. P. DUNN, L. APUZZO, and J. JABS. Johns Hopkins Med. Inst., Baltimore, Md.
- C228. Effect of Staphylococcal Size on Susceptibility Test Results of Cephalosporins. (065) S. D. ABRAMSON, J. W. LEWIS,\* and S. G. JENKINS. Baptist Med. Ctr., Jacksonville, Fla.
- C229. Synergistic Antibacterial Activity of Ofloxacin in Combination with Cefotaxime and Desacetylcefotaxime. (067) S. G. JENKINS\* and J. W. LEWIS. Baptist Med. Ctr., Jacksonville, Fla.
- C230. Mupirocin and Fusidic Acid Susceptibility Testing in *Staphylococcus aureus* Isolated from Ontario and New York. (069) J. L. BERTOIN,\* J. M. THUSUSKA, D. LOW, R. PRIKOSOVITCH, G. SMALL, R. JAEGER, and S. SCRIVER. Peel Mem. Hosp. and Mount Sinai Hosp., Univ. of Toronto, and MDS Lab., Toronto, Ontario, Canada.
- C231. In Vitro Activity of Temafloxacin, Ciprofloxacin, and Ofloxacin against  $\beta$ -Lactam-Resistant and -Sensitive Gram-Positive Bacteria. (071) J. BISCHOFF,\* M. LUTFEY, L. BANKOWSKI, P. DELLA-LATTA, and M. S. SIMBERKOFF. New York VA Med. Ctr. and NYU Sch. of Med., New York, N.Y.
- C232. Comparative In Vitro Activities of Ramoplanin, Glycopeptides, Quinolones, and Other Antimicrobial Agents against Bacteremic Isolates of Gram-Positive Cocci. (073) D. AMSTERDAM,\* T. LAWRENCE, E. A. GORZYNSKI, T. R. BEAM, JR., and C. ROTSTEIN. Erie County Med. Ctr., VA Med. Ctr., and Univ. at Buffalo, Buffalo, N.Y., and McMaster Univ., Hamilton, Ontario, Canada.
- C233. Survey of Antibiotic Susceptibility of Gram-Negative Bacilli in a Cancer Hospital. (075) K. ROLSTON,\* D. HO, B. LEBLANC, L. ELTING, and G. P. BODEY. Univ. of Texas M. D. Anderson Cancer Ctr., Houston.
- C234. Antibiotic Susceptibility, Lactose Reaction, and  $\beta$ -Glucuronidase Activity of *Escherichia coli* in Urine. (077) L. SCHEININ\* and H. TUOMPO. Orion Diagnostica, Espoo, Finland.
- C235. Cefuroxime Axetil: Need for New Interpretative Standards for the Disk Diffusion Test when Testing *Escherichia coli*. (079) P. VOGELSANGER, D. DESGRANDCHAMPS,\* and J. MUNZINGER. Dept. of Med. Microbiol. and Dept. of Pediatrics, Kantonsspital, Lucerne, Switzerland.
- C236. Susceptibilities of *Moraxella catarrhalis*, *Haemophilus influenzae*, and *Streptococcus pneumoniae* against Ampicillin, Augmentin, Cefaclor, and Cefixime. (081) D. GOPAUL,\* S. FINN, B. DIENA, D. HATHAWAY, and A. MCKEOWN. St. Joseph's Health Ctr., London, Ontario, Canada; Daniel Med. Lab., Downsview, Ontario, Canada; and St. Joseph's Hosp., Sarnia, Ontario, Canada.
- C237. Comparison of Four Inoculum Preparation Methods for Disk Diffusion Susceptibility Testing of *Haemophilus influenzae*. (083) J. A. HINDLER\* and L. MANZANO. UCLA Med. Ctr., Los Angeles, Calif.
- C238. Comparison of Disk Diffusion, Agar Dilution, and Broth Dilution for Susceptibility Testing of *Haemophilus influenzae* and Selected Cephalosporins. (085) M. GHANEM,\* J. SOL-



- LIDAY, and J. P. GAYRAL. BioMerieux Vitek, Inc., St. Louis, Mo.
- C239.** Comparison of Haemophilus Test Medium and Supplemented Mueller-Hinton Medium for Antimicrobial Susceptibility Testing of *Haemophilus influenzae*. (087) C. THORNSBERRY, J. K. MARLER,\* and T. J. RICH. Inst. for Microbiol. Res., Franklin, Tenn.
- C240.** Comparison of Antibiotic Susceptibility of *Haemophilus influenzae* Tested on Haemophilus Test Medium and Mueller-Hinton Chocolate Medium. (089) D. DRYJA,\* H. FADEN, S. ALTAIE, and L. DUFFY. SUNY at Buffalo and Children's Hosp., Buffalo, N.Y.
- C241.** Suppression of *Haemophilus influenzae* L-Form Growth on Haemophilus Test Medium Using Media Additives To Improve Ampicillin Susceptibility Endpoints. (091) J. MOODY. St. Paul-Ramsey Med. Ctr., St. Paul, Minn.
- C242.** In Vitro Activity of Clarithromycin against *Mycobacterium avium* Complex. (093) R. HUMES,\* R. LUSKIN, and B. JILLY. St. Joseph Hosp. and Univ. of Illinois, Chicago.
- C243.** Activity of Five Quinolone Antibiotics versus Isolates of *Pseudomonas aeruginosa* from Cystic Fibrosis Patients. (095) S. K. SPANGLER, P. C. APPELBAUM, R. L. SAUTTER, D. SIPES, K. J. STOUT, and P. J. PADGETT.\* Hershey Med. Ctr., Hershey, Pa.; Harrisburg Hosp., Harrisburg, Pa.; and Shippensburg Univ., Shippensburg, Pa.
- C244.** Disc Diffusion Testing of *Xanthomonas maltophilia*. (097) C. POULOS,\* B. MUSTACHI, K. SCHOER, R. ROBERTSON, K. O'QUINN, and A. MCGEER. Princess Margaret Hospital, Ontario Cancer Inst., Toronto, Ontario, Canada.
- C245.** Evaluation of a Rapid Technique for Predicting Antimicrobial Resistance in Mixed Aerobic/Anaerobic Infections. (099) M. GELFAND\* and J. GROGAN. Methodist Hosp., Memphis, Tenn.
- C246.** Changes in Antimicrobial Susceptibility among Repeat Clinical Isolates. (101) P. VALENS TEIN and B. BACKES.\* Catherine McAuley Health Ctr., Ann Arbor, Mich.
- C247.** Microtiter Checkerboard for Antibiotic Synergy: Study of Reproducibility. (103) K. RAND,\* H. HOUCK, and D. BENNETT. Univ. of Florida, Gainesville, and Alamar, Sacramento, Calif.
- C248.** Comparison of a New Latex Turbidity Standard with the Barium Sulfate McFarland Standard. (105) J. L. PERRY,\* J. S. MATTHEWS, and G. R. MILLER. VA Med. Ctr. and Wichita State Univ., Wichita, Kans.
- C249.** Effect of Mueller-Hinton Broth and Zinc Supplementation on the Activity of Imipenem and Meropenem. (107) R. WHITE, L. FRIEDRICH,\* and D. BURGESS. Med. Univ. of South Carolina, Charleston.
- C250.** Comparison of the Efficacy of Topical Clindamycin with Sulfamylon, Silvadene, and Bactroban against Clinical Burn Wound Isolates. (109) M. A. WALTON,\* E. CARINO, D. N. HERNDON, and J. P. HEGGERS. Shriners Burns Inst. and Dept. of Surgery and Microbiol., Univ. of Texas Med. Branch, Galveston.

### Session 237 (A). SUSCEPTIBILITY AND RESISTANCE TO $\beta$ -LACTAMS

- A103.** In Vitro Activity of Cefdinir (CI-983) against Common Pediatric Respiratory Pathogens. (111) A. C. ARRIETA,\* A. G. ARGUEDAS, J. C. AKANIRO, O. M. VARGAS, and H. R. STUTMAN. Mem. Miller Children's Hosp., Long Beach, Calif., and Univ. of California, Irvine.
- A104.** In Vitro Activity of Cefdinir (CI-983) against Invasive Pathogens from Pediatric Patients. (113) J. C. AKANIRO,\* O. VARGAS, and H. R. STUTMAN. Univ. of California, Irvine, and Mem. Miller Children's Hosp., Long Beach, Calif.
- A105.** Susceptibility of 170 Penicillin-Susceptible and -Resistant Pneumococci to Cefdinir, Cefpodoxime, Cefaclor, Cefuroxime, and Cefixime. (115) S. K. SPANGLER, M. R. JACOBS, and P. C. APPELBAUM.\* Hershey Med. Ctr., Hershey, Pa., and Case Western Reserve Univ., Cleveland, Ohio.
- A106.** Comparative In Vitro Activity of a New Cephalosporin, Cefdinir (CI-983), against Common Respiratory Pathogens. (117) B. WILLEY,\* S. R. SCRIVER, and A. E. SIMOR. Mount Sinai Hosp., Univ. of Toronto, Toronto, Ontario, Canada.
- A107.** Antimicrobial Activity of Cefdinir (CI-983, FK 482) and 10 Other Antibiotics against Gram-Positive and Gram-Negative Bacteria. (119) T. SULTAN,\* W. RITZ, and R. P. SMITH. VA Med. Ctr. and Albany Med. Col., Albany, N.Y.
- A108.** In Vitro Activity of Ro23-9424, a Dual-Action Cephalosporin, against Bacterial Isolates from Cancer Patients. (121) K. ROLSTON,\* H. NGUYEN, D. HO, and G. P. BODEY. Univ. of Texas M. D. Anderson Cancer Ctr., Houston.
- A109.** In Vitro Activity of Meropenem against Coagulase-Negative Staphylococci. (123) P. VERMA,\* R. SCHWALBE, A. HYMAN, T. TEVES, J. WILSON, and L. DAM. Univ. of Maryland, Baltimore.
- A110.** Susceptibilities of the *Vibrionaceae* to Meropenem and Other Antimicrobial Agents. (125) R. B. CLARK. Crozer-Chester Med. Ctr., Upland, Pa.
- A111.** In Vitro Activity of Double  $\beta$ -Lactam Combinations against Oxacillin-Resistant *Staphylococcus aureus* and *Staphylococcus epidermidis*. (127) M. GELFAND and J. GROGAN.\* Methodist Hosp., Memphis, Tenn.
- A112.** Comparison of Cross-Resistance Patterns to Cephalosporin-Cepharmycin Antimicrobial Agents among the *Bacteroides fragilis* Group. (129) K. E. ALDRIDGE\* and A. HENDERBERG. Louisiana State Univ. Med. Ctr., New Orleans.
- A113.** Resistance to Ticarcillin-Clavulanic Acid among *Enterobacteriaceae* in Nine U.S. Medical Centers. (131) A. L. BARRY. Clin. Microbiol. Inst., Tualatin, Oreg.
- A114.** Resistance to Ampicillin/Clavulanate Synergism by Mutation of Arg-244 in the TEM-1  $\beta$ -Lactamase. (133) E. K. MANAVATHU,\* G. ZAFARALLA, S. MOBASHERY, and S. A. LERNER. Wayne State Univ., Detroit, Mich.
- A115.** N-Terminal Amino Acid Sequence of PBP-2 Peptides of *Staphylococcus aureus*. (135) T. KOCAGOZ,\* T. MORRIS, S. KOCAGOZ, C. MIICK, and H. CHAMBERS. Dept. of Med., San Francisco Gen. Hosp., and Univ. of California, San Francisco.
- A116.** Immunolocalization of *Mycobacterium fortuitum*  $\beta$ -Lactamase. (137) B. WAGNER, L. FATTORINI, M. WAGNER, S. H. JIN, G. AMICOSANTE, and G. OREFICI.\* Inst. of Microbiol., Jena, Germany; Istituto Superiore di Sanità, Rome, Italy; and Inst. of Biochemistry, L'Aquila, Italy.
- A117.** Cloning of a *Bacteroides fragilis* Chromosomally Encoded Cephalosporinase. (139) M. B. ROGERS\* and C. J. SMITH. Sch. of Med., East Carolina Univ., Greenville, N.C.
- A118.** In Vitro Susceptibility of 1,046 *Bacillus fragilis* Group Isolates to 19  $\beta$ -Lactam Drugs and Inhibitor Combinations. (141) G. J. CUCHURAL, JR., D. R. SNYDMAN, and L. A. MCDERMOTT.\* Tufts-New England Med. Ctr., Boston, Mass.
- A119.** In Vitro Study of the Susceptibility of *Bacteroides fragilis* Group. (143) L. VARNER,\* D. SCHIRO, K. E. ALDRIDGE, and MULTICENTER STUDY GROUP. Louisiana State Univ. Med. Ctr., New Orleans.
- A120.** *Klebsiella* Resistant to Third-Generation Cephalosporins. (145) A. KURITZA\* and M. OEHLER. Rush-Presbyterian-St. Luke's Med. Ctr., Chicago, Ill.
- A121.** Regulation of Both  $\beta$ -Lactamase and PBP2a Production in Methicillin-Resistant *Staphylococcus aureus* Involves Two

Genes Found Upstream of the  $\beta$ -Lactamase Gene (*blaZ*). (147) C. J. HACKBARTH\* and P. F. CHAMBERS. Univ. of California and San Francisco Gen. Hosp., San Francisco.

- A122. Antibiotic Susceptibility Profiles and  $\beta$ -Lactamase Activity in Strains of *Bacillus anthracis*. (149) P. MIKESELL,\* D. A. HILLANBRAND, A. M. FRIEDLANDER, and K. BUSH. U.S. Army Med. Res. Inst. of Infectious Diseases, Fort Detrick, Frederick, Md., and American Cyanamid, Pearl River, N.Y.
- A123. Effect of Zinc Reversal of Calprotectin on Cefazolin Activity in a *Staphylococcus aureus* Abscess Milieu. (151) D. BAMBERGER. Univ. of Missouri Sch. of Med., Kansas City.
- A124. Efficacy of Cefmetazole against Methicillin-Resistant and Susceptible Staphylococci and in an In Vivo Rabbit Model. (153) L. SINN,\* N. OPSTAD, L. PETERSON, and D. GERDING. VA Med. Ctr. and Univ. of Minnesota, Minneapolis.

### Session 238 (Q). BIOFILMS, BIOFOULING, AND CORROSION

- Q261. Enzymatic Detachment of Adherent Bacterial Cells. (155) C. L. WIATR. Nalco Chemical Co., Naperville, Ill.
- Q262. Metal Corrosion Coupled to a Hydrogen-Utilizing Methanogenic Bacterium. (157) W. H. LOROWITZ,\* D. P. NAGLE, JR., and R. S. TANNER. Univ. of Oklahoma, Norman.
- Q263. Method for Evaluating Efficacy of Antimicrobial Agents for Control of Sulfate-Reducing Bacteria in Petroleum Reservoirs. (159) K. B. BARRETT,\* W. A. APEL, and J. MCCUNE. Idaho Nat. Engineering Lab., Idaho Falls, and Idaho State Univ., Pocatello.
- Q264. Selective Inhibition of CO<sub>2</sub> Assimilation in the Obligately Chemolithoautotrophic Acidophile *Thiobacillus thiooxidans*. (161) H. SIMA\* and R. G. ARNOLD. Ecology & Environment, Inc., Fresno, Calif., and Univ. of Arizona, Tucson.
- Q265. Electrical Enhancement of Bacterial Biocides against Sessile Populations. (163) S. A. BLENKINSOPP,\* C. P. ANDERSON, B. D. ELLIS, K. LAM, J. W. COSTERTON, and A. E. KHOURY. Univ. of Calgary, Calgary, Alberta, Canada, and Sick Children's Hosp., Toronto, Ontario, Canada.
- Q266. Flow Cell Biofouling Study of Iron Bacteria (*Gallionella* and *Leptothrix* spp.) and Methylophilic *Hyphomicrobium* spp. in Water Wells. (165) L. TUHELA\* and O. H. TUOVINEN. Ohio State Univ., Columbus.
- Q267. Substratum Effects on Biofilm Formation. (167) E. JOYCE,\* D. HOGAN, T. FORD, and R. MITCHELL. Lab. of Microbial Ecology, Harvard Univ., Cambridge, Mass.
- Q268. Disinfection Kinetics of a *Klebsiella* Biofilm on Stainless Steel Using a Rapid Direct Viable Count Method. (169) F. P. YU,\* B. H. PYLE, and G. A. MCFETERS. Dept. of Microbiol., Montana State Univ., Bozeman.
- Q269. Comparison of the Corrosion Rates and Biomass Associated with 1010 Mild Steel Coupons after 56 Days of Exposure in Polluted and Nonpolluted Lotic Habitats. (171) R. DIAZ,\* S. NOLD, M. W. MITTELMAN, J. GUEZENNEC, N. J. E. DOWLING, and D. C. WHITE. Ctr. for Environmental Biotechnology, Univ. of Tennessee, Knoxville.

### Session 239 (N). BIOLOGY OF N<sub>2</sub> FIXATION

- N78. Hyper-Reiterated DNA Regions Are Conserved among *Bradyrhizobium japonicum* Serocluster 123 Strains. (173) A. K. JUDD,\* F. RODRIGUEZ-QUINONES, and M. J. SA-

DOWSKY. Univ. of Minnesota, St. Paul, and Univ. de las Ilas Baleares, Palma De Mallorca, Spain.

- N79. Identification and Characterization of Proteins Involved in the *Bradyrhizobium* sp. (*Arachis*) Strain NC92-Groundnut Symbiosis. (175) T. MILLER\* and G. H. ELKAN. North Carolina State Univ., Raleigh.
- N80. Accessory Genes Required for Hydrogenase Synthesis and Processing in *Bradyrhizobium japonicum*. (177) C. FU\* and R. J. MAIER. Johns Hopkins Univ., Baltimore, Md.
- N81. Identification and Analysis of *nodVW*-Like Loci in *Bradyrhizobium* sp. Strain USDA 83. (179) S. E. UDELL,\* L. D. KUYKENDALL, and G. H. ELKAN. North Carolina State Univ., Raleigh, and USDA, Agricultural Res. Service, Beltsville, Md.
- N82. Nucleotide Sequence and Regulatory Properties of a Novel Flavonoid-Induced Locus in *Bradyrhizobium japonicum* USDA110. (181) T. C. DOCKENDORFF,\* A. SHARMA, and G. STACEY. Univ. of Tennessee, Knoxville.
- N83. Negative Regulation of *Bradyrhizobium japonicum* Nodulation Genes. (183) J. SANJUAN,\* D. HATTERMANN, and G. STACEY. Ctr. for Legume Res. and Dept. of Microbiol., Univ. of Tennessee, Knoxville.
- N84. Novel Host-Inducible Genetic Locus Tightly Linked to the *nodABC* Genes of *Bradyrhizobium japonicum*. (185) S. LUKA\* and G. STACEY. Ctr. for Legume Res. and Dept. of Microbiol., Univ. of Tennessee, Knoxville.
- N85. A Host-Specific Nitrogen Fixation Mutant of *Bradyrhizobium japonicum*. (187) J.-Y. CHUN\* and G. STACEY. Univ. of Tennessee, Knoxville.
- N86. Phylogenetic Position of *Rhizobium* Or 191, a Nitrogen-Fixing Symbiont of both *Medicago* and *Phaseolus*. (189) B. EARDLY,\* J. YOUNG, and R. SELANDER. Pennsylvania State Univ., Berks Campus, Reading; John Innes Inst., Norwich, U.K.; and Pennsylvania State Univ., University Park.
- N87. Studies of *Rhizobium* Plasmids for the Construction of a *Rhizobium* Cloning Vector (191) P. JEONG. Dept. of Biol. Sci., Univ. of North Texas, Denton.
- N88. Tellurium and Selenium Resistance in Rhizobia. (193) B. K. KINKLE, M. J. SADOWSKY,\* and W. C. KOSKINEN. USDA, Agricultural Res. Service, and Soil Sci. Dept., Univ. of Minnesota, St. Paul.
- N89. Production of the Plant Hormone Ethylene by Soybean Roots and Nodules. (195) W. J. HUNTER. USDA, Agricultural Res. Service, Fort Collins, Colo.
- N90. Metabolic Potential of *Rhizobium* Isolated from Root Nodules of *Sesbania*. (197) M. ASHRAF\* and M. I. H. ALEEM. Univ. of Kentucky, Lexington.
- N91. Distribution and Diversity of *Azotobacter* at Various Soil Depths of Chihuahuan Desert Playa. (199) S. CORK,\* B. B. HEMMINGSEN, L. A. HOOK, and R. A. VIRGINIA. San Diego State Univ. and AMBIS Inc., San Diego, Calif.
- N92. Cloning and Expression of an Endoglucanase Gene from the N<sub>2</sub>-Fixing Actinomycete Plant Symbiont *Frankia*. (201) T. J. HOSTED,\* J. T. LEONARD, and D. R. BENSON. Univ. of Connecticut, Storrs.

### Session 240 (R). MICROBIAL SYSTEMATICS AND DIVERSITY

- R9. DNA Relatedness of *Bacillus thuringiensis* Serovars. (203) L. NAKAMURA. Nat. Ctr. for Agricultural Utilization Res., USDA, Agricultural Res. Service, Peoria, Ill.
- R10. A Further Zymogram Analysis of Strains of *Bacillus brevis*. (205) A. MADJID\* and S. SINGER. Western Illinois Univ., Macomb.

- R11.** Microbiological Characterizations on Thermophilic Nitrogen-Fixing *Bacillus* Soil Isolates. (207) B. W. KIM,\* P. JURTSUK, JR., and L. JURTSUK. Dept. of Biol., Univ. of Houston, and Clear Lake H. S., Houston, Tex.
- R12.** Numerical Taxonomic Study of Fluorescent Species of *Pseudomonas*. (209) C. MCMANUS,\* E. ASAKI, and S. SRIVASTAVA. Nat. Inst. of Dent. Res., Bethesda, Md., and American Type Culture Collection, Rockville, Md.
- R13.** New Supervirulent *Agrobacterium tumefaciens* Strains from Egyptian Habitats. (211) Y. A. OSMAN,\* A. EL-BAKRY, and M. MADKOUR. Nat. Agricultural Genetic Engineering Lab., Giza, Egypt.
- R14.** Numerical Taxonomy of *Porphyromonas* Strains. (213) E. MOLITORIS, D. REEVES,\* and S. M. FINEGOLD. UCLA Sch. of Med. and VA Wadsworth Med. Ctr., Los Angeles, Calif.
- R15.** Polymerase Chain Reaction Amplification of Prokaryotic 16S rRNA Genes from Moth-Testes (*Heliothis* spp.) Extracts. (215) C. KRUEGER,\* M. DEGRUGILLIER, and S. NARANG. USDA Agriculture Res. Service, Biosci. Res. Lab., Fargo, N.Dak.
- R16.** Nutritional Characterization of *Rhodococcus chlorophenolicus* Strains. (217) N. J. PALLERONI\* and M. M. HAGGBLOM. NYU Med. Ctr., New York, N.Y.
- R17.** Taxonomics of Coryneform CDC Taxon Groups. (219) D. DE BRIEL,\* P. RIEGEL, F. JEHL, and R. MINCK. Inst. Bactériol., Fac. Méd., Strasbourg, France.
- R18.** Characterization of Two Variants of *Eubacterium yurii* subsp. *yurii*. (221) C. DABIRSIAGHI\* and G. N. KRYWOLAP. Univ. of Maryland Dent. Sch., Baltimore.
- R19.** Analysis of Enzyme-Linked Immunosorbent Assay Data Using Phylogenetic Techniques. (223) R. V. GESSNER, K. C. KEUDELL,\* and S. W. JUNG. Western Illinois Univ., Macomb.
- R20.** Endospore Formation in an Anoxygenic Phototroph. (225) M. ELEUTERIO. West Chester Univ., West Chester, Pa.
- R21.** Habitat Temperature and Aridity as Factors in the Speciation of Antarctic Yeasts. (227) H. S. VISHNIAC\* and C. P. KURTZMAN. Oklahoma State Univ., Stillwater, and National Ctr. for Agricultural Utilization Res., USDA, Agricultural Res. Service, Peoria, Ill.

## Session 241 (H). NOVEL VECTORS AND OVEREXPRESSION SYSTEMS

- H238.** Isolation of Plasmids from *Actinobacillus actinomycetemcomitans* and Construction of Potential Shuttle Plasmids. (229) P. K. SREENIVASAN,\* D. J. LEBLANC, L. N. LEE, and P. FIVES-TAYLOR. Univ. of Vermont, Burlington, and Univ. of Texas Health Sci. Ctr., San Antonio.
- H239.** Movement of Shuttle Plasmids from *Escherichia coli* into Yeasts Other than *Saccharomyces cerevisiae*, Using Transkingdom Conjugation. (231) G. T. HAYMAN and P. L. BOLEN.\* Nat. Ctr. for Agricultural Utilization Res., Agricultural Res. Service, USDA, Peoria, Ill.
- H240.** Development of a Gene Transfer System in Marine Unicellular Nitrogen-Fixing *Cyanothece* sp. Using a Shuttle Vector. (233) B. W. SOPER and K. J. REDDY.\* Dept. of Biol. Sci., SUNY at Binghamton, Binghamton, N.Y.
- H241.** Expression of a Plant CREB-Like Protein in *Escherichia coli* Cells. (235) K. C. EHRLICH\* and M. EHRLICH. Southern Regional Res. Ctr., USDA, and Dept. of Biochemistry, Tulane Univ., New Orleans, La.
- H242.** Rapid Amplification, Cloning, and Expression of Foreign Genes Using Expression Cassette Polymerase Chain Reaction and Uracil DNA Glycosylase. (237) G. W. BUCHMAN,\* J. L. HARTLEY, and A. RASHTCHIAN. Life Technologies, Inc., Gaithersburg, Md.
- H243.** A Two-Component T7 Expression System for the Overproduction of Gene Products in *Pseudomonas aeruginosa*. (239) E. BRUNSCHWIG and A. DARZINS.\* Dept. of Microbiol., Ohio State Univ., Columbus.
- H244.** Improved Method for Electroporation of *Staphylococcus aureus*. (241) S. SCHENK and R. A. LADDAGA.\* Bowling Green State Univ., Bowling Green, Ohio.
- H245.** Cloning and Expression of *Escherichia coli* Superoxide Dismutase in *Lactobacillus lactis*. (243) D. GUPTA\* and H. M. HASSAN. North Carolina State Univ., Raleigh.
- H246.** Shuttle Vectors Developed from Cryptic Plasmid of *Streptococcus thermophilus*. (245) D. K. Y. SOLAIMAN,\* G. A. SOMKUTI, and D. H. STEINBERG. Eastern Regional Res. Ctr., USDA, Philadelphia, Pa.
- H247.** Construction of a Secretion System for Oral Gram-Positive Bacteria. (247) T. SHIROZA\* and H. K. KURAMITSU. Univ. of Texas Health Sci. Ctr., San Antonio.
- H248.** Construction of a First-Generation Lactococcal Integrative Food-Grade Cloning Vector. (249) D. MCINTYRE\* and S. HARLANDER. Univ. of Minnesota, St. Paul.
- H249.** Novel Recombinant Plasmid Encoding for the Form I Antigen of *Shigella sonnei* with the *gal* Operon as the Positive Selective Marker. (251) H.-S. H. HOUNG,\* C. DAYDAY, and L. S. BARON. Walter Reed Army Inst. of Res., Washington, D.C.
- H250.** Generation of a Modified *Escherichia coli* Expression Vector under *lacZ* Control by Recombinant Circle Polymerase Chain Reaction. (253) J. R. LOWE\* and M. S. ROOK. U.S. Army Med. Res. Inst. of Infectious Diseases, Frederick, Md., and Texas A&M Univ., College Station.
- H251.** Secretion of Human Transferrin by *Escherichia coli* and *Saccharomyces cerevisiae*. (255) J. L. LARSON, H. C. ZHANG, C. C. FRYE,\* J. IVANCIC, and C. L. HERSHBERGER. Lilly Res. Lab., a Div. of Eli Lilly & Co., Indianapolis, Ind.
- H252.** Kinetic Analysis of Insulinlike Growth Factor I Pulse-Chase Labeling in *Escherichia coli*. (257) W. G. MCDONALD,\* J. F. CAPUTO, and R. A. LEPLEY. Upjohn Co., Kalamazoo, Mich.
- H253.** Simultaneous Detection of DNA and RNA by Differential Polymerase Chain Reaction. (259) P. IMBODEN,\* T. BURKART, and K. SCHOPFER. Inst. of Med. Microbiol., Univ. of Berne, Berne, Switzerland.
- H254.** Use of Adenovirus VA1 Promoter, a RNA Polymerase III Promoter, in Engineering Antisense RNA. (261) J. BENN\* and A. B. FREY. Dept. of Cell Biol., NYU Med. Ctr., New York, N.Y.
- H255.** Recombinant Plasmids Rescued from Transformants for *Pleurotus ostreatus*. (263) M. PENG,\* P. LEMKE, and N. SINGH. Dept. of Botany and Microbiol., Auburn Univ., Auburn, Ala.
- H256.** *Salmonella* Exposition Vectors Derived from *TnphoA* Fusion Strains. (265) L. PHILLIPS,\* S. MONCRIEF, and D. NIESEL. Univ. of Texas Med. Branch, Galveston.
- H257.** pJANUS: a Novel  $\gamma\delta$  (*Tn1000*)-Based Cosmid Cloning Vector Designed for In Vivo Generation of Nested Deletions. (267) G. WANG,\* D. BERG, R. W. BLAKESLEY, and C. M. BERG. Univ. of Connecticut, Storrs; Washington Univ. Med. Sch., St. Louis, Mo.; and Life Technologies, Gaithersburg, Md.
- H258.** Application of Recombinant DNA Techniques to Hyaluronic Acid-Producing Streptococcal Strains. (269) M. O'REGAN,\* E. CONTI, I. MARTINI, and L. CALLEGARO. Advanced Technology Div., FIDIA S.p.A., Abano Terme (PD), Italy.

**H259.** Expression of Recombinant Snake Venom Cardiotoxin Protein from a Synthetic Gene. (271) P. ZHU\* and W. TRUMBLE. Dept. of Bacteriol. and Biochemistry, Univ. of Idaho, Moscow.

### Session 242 (T). DETECTION OF HUMAN RETROVIRUSES

**T38.** Sensitive Detection of Human T-Lymphotropic Virus Type I and Type II Viral Particles in Culture Supernatants Using a Reverse Transcription-Polymerase Chain Reaction. (273) K. KITAMURA,\* W. HENEINE, R. LAL, and T. M. FOLKS. CDC, Atlanta, Ga.

**T39.** Synthetic Peptide-Based Immunoassay for the Detection of Antibodies to Human T-Lymphotropic Virus Types I and II. (275) P. COLEMAN,\* J. W. MORGAN, and P. SU. Genetic Systems Corp., Sanofi Diagnostics Pasteur, Redmond, Wash.

**T40.** Chemiluminescent Immunoassay for the Detection of Human T-Cell Lymphotropic Virus Type I Surface Protein. (277) L. PAPSIDERO,\* R. DITTMER, L. VAICKUS, and B. POIESZ. Cellular Products, Inc., and Roswell Park Cancer Inst., Buffalo, N.Y., and SUNY Health Sci. Ctr., Syracuse, N.Y.

**T41.** Detection of Human Immunodeficiency Virus Type I Infection in Pediatric Patients. (279) L. VILLANUEVA,\* C. CADILLA, A. M. DIAZ, R. DELGADO, O. RIOS, E. JIMENEZ, and E. KRAISELBURD. Univ. of Puerto Rico, Sch. of Med., and Municipal Hosp. and AIDS Inst., San Juan, Puerto Rico.

**T42.** Detection of Human T-Cell Leukemia Virus Types I and II in an Intravenous-Drug Abuser Population by Using Polymerase Chain Reaction in Combination with a Colorimetric Microtiter Plate Assay. (281) L. WOLFE,\* W. SCHILLING, D. METZGER, and R. MACGREGOR. PCR Division, Roche Diagnostic Systems Inc., Fair Lawn, N.J., and Univ. of Pennsylvania Med. Sch., Philadelphia.

**T43.** Indeterminate Western Blot Results in Populations of Varying Risk for Human Immunodeficiency Virus Infection. (283) C. SPRUILL\* and I. ONORATO. CDC, Atlanta, Ga.

**T44.** Rapid Quantitative Dilutional Human Immunodeficiency Virus Type 1 (HIV-1) Polymerase Chain Reaction To Detect Viral Load in HIV-1-Infected Blood Samples from Intravenous-Drug Abusers. (285) S. W. JONES,\* C. S. CONTOREGGI, and W. A. MEYER III. Maryland Med. Lab., Inc., and Nat. Inst. of Drug Abuse, Baltimore.

**T45.** Evaluation of an Immunoblot Assay for Confirmation and Differentiation of Human T-Cell Lymphotropic Virus Types I and II Infection. (287) B. ROBERTS,\* J. LIPKA, S. FOUNG, J. KAPLAN, K. HADLOCK, G. REYES, and R. KHABBAZ. Retrovirus Diseases Branch, CDC, Atlanta, Ga.; Dept. of Pathology, Stanford Univ. Sch. of Med., Palo Alto, Calif.; and Genelabs, Redwood City, Calif.

**T46.** Measurement of p24 Antigen before and after Acid Dissociation of Circulating Immune Complexes with HCl or Glycine in the Sera of Human Immunodeficiency Virus-Positive Patients. (289) R. POKRIEFKA,\* O. MANZOR, N. MARKOWITZ, and L. SARAVOLATZ. Henry Ford Hosp., Detroit, Mich.

**T47.** Ability of the Innogenetics Inno-LIA To Distinguish Human Immunodeficiency Virus Type 1 (HIV-1)-, HIV-2-, and Dually Reactive Sera. (291) T. C. GRANADE,\* S. K. PHILLIPS, and J. R. GEORGE. CDC, Atlanta, Ga.

**T48.** Use of Recombinant or Synthetic Peptide Human Immunodeficiency Virus Type I Assays in the Resolution of Indeterminant Western Blot Results. (293) S. COFFEE\* and R. ALEXANDER. San Bernardino County Publ. Health Lab., San Bernardino, Calif.

**T49.** Reevaluating Human Immunodeficiency Virus Type 1 (HIV-1) Antibody-Indeterminate Sera Utilizing HIV-1/HIV-2 Synthetic Peptide Enzyme Immunoassays. (295) R. A. MYERS,\* J. D. PATEL, and J. M. JOSEPH. Maryland Dept. of Health Lab., Baltimore.

**T50.** Analysis of Human Immunodeficiency Virus Type 1-Infected Patients and Their Seronegative Partners by Polymerase Chain Reaction and a Rapid Nonradioactive Microtiter Plate Hybridization Assay. (297) K. KUNG,\* R. MACGREGOR, and E. DRAGON. Roche Diagnostic Systems Inc., Fair Lawn, N.J., and Univ. of Pennsylvania, Philadelphia.

**T51.** Evaluation of a Single Primer Pair for the Detection of Human Immunodeficiency Virus Type 1 in Clinical Specimens by Polymerase Chain Reaction Amplification. (299) A. BUTCHER,\* L. SALTER, S. KINARD, K. KUNG, B. MCCREEDY, and J. SPADORO. Roche Diagnostic Systems, Inc., Fair Lawn, N.J., and Roche Biomed. Lab., Research Triangle Park, N.C.

**T52.** Detection of Human T-Cell Lymphotropic Virus Types I and II in an Enzyme Immunoassay Repeat Reactive Blood Donor Population Using Polymerase Chain Reaction in Combination with a Colorimetric Microtiter Plate Assay. (301) M. RIOS, W. SCHILLING,\* M. DURAN, C. BIANCO, and L. WOLFE. New York Blood Ctr., New York, N.Y., and PCR Div., Roche Diagnostic Systems Inc., Fair Lawn, N.J.

**T53.** Quantitation of Human Immunodeficiency Virus Plasma Viremia by Peripheral Blood Mononuclear Cell Microculture. (303) J. LATHEY\* and S. A. SPECTOR. Univ. of California-San Diego, La Jolla.

**T54.** Evaluation with Polymerase Chain Reaction of Human Immunodeficiency Virus Type 1 Infection before Seroconversion in Individuals at High Risk. (305) F. COUTLEE,\* C. OLIVIER, H. VOYER, P. ST.-ANTOINE, S. CASSOL, and A. KESSOUS. Hôpital Notre-Dame and Clin. Med. l'Actuel. Univ. of Montreal, Montreal, Quebec, Canada.

**T55.** Human Immunodeficiency Virus DNA Titer in Infected Infants. (307) C. BRANDT,\* A. SISON, T. RAKUSAN, E. SAXENA, and J. SEVER. Children's Nat. Med. Ctr., George Washington Univ., and Georgetown Univ., Washington, D.C.

**T56.** Use of Beta-2-Microglobulin and P24 Antibody in Predicting Progression to AIDS in a Heterogeneous Population. (309) Y. MCCARTER,\* D. MAYO, and H. SHEPPARD. Hartford Hosp. and Connecticut State Health Dept., Hartford, and Dept. of Health Services, Berkeley, Calif.

**T57.** Amplification of Human Immunodeficiency Virus Type 1 *gag* Gene from Microdissected Cells of Kidney Biopsy Archival Material. (311) A. FERREIRA-CENTENO,\* P. L. KIMMEL, E. R. RODRIGUEZ, A. A. ABRAHAM, and C. T. GARRETT. George Washington Univ. Med. Ctr., Washington, D.C.

**T58.** Performance Evaluation of a Polymerase Chain Reaction-Microtiter Plate Hybridization Assay for the Detection of Human Immunodeficiency Virus Type 1 DNA. (313) Z. WANG,\* S. KINARD, K. KUNG, A. BUTCHER, and J. SPADORO. Roche Diagnostic Systems, Inc., Fair Lawn, N.J.

**T59.** Human Immunodeficiency Virus Antigen Detection in Acid-Hydrolyzed Plasma and Sera of AIDS Infants. Effect of Specimen Dilution. (315) M. PAUL,\* and S. PAHWA. Cornell Med. Col., Manhasset, N.Y.

**T60.** Quantitation of Human Immunodeficiency Virus Type 1 DNA Using Polymerase Chain Reaction with Electrochemiluminescence and High-Performance Liquid Chromatography. (317) E. D. KATZ,\* E. PICOZZA, and J. L. DICESARE. Perkin-Elmer Corp., Wilton, Conn.

**T61.** Treatment of Friend Leukemia Virus Infection with Combinations of Antivirals and Immunostimulants. (319) S. SPECTER,\* G. LANCZ, N. PLOTNIKOFF, G. WEST

RICH, D. GOODFELLOW, and T. SMITH. Univ. of South Florida Col. of Med., Tampa.

- T62. Intermittent Human Immunodeficiency Virus Type 1 Antibody and Antigen Seropositivity in Two Healthy Individuals. (321) P. LIANOU, N. PAPADOPOULOS, A. FORTIS, and I. PAPAVALASSIOU.\* AIDS Ctr., Dept. of Microbiol., Univ. of Athens, Athens, Greece.

## POSTER SESSIONS

Friday, 3:00-4:30 P.M., Exhibit Hall C

(Board numbers in parentheses)

### Session 243 (C). DETECTION OF EMERGING RESISTANCE TO ANTIBIOTICS

- C251. In Vitro Activity of Ofloxacin and Ciprofloxacin against Methicillin-Resistant Staphylococci. (002) K. R. SMITH,\* M. S. PATE, and C. G. COBBS. Univ. of Alabama and VA Med. Ctr., Birmingham.
- C252. A Method To Identify Methicillin-Resistant *Staphylococcus aureus* within 4 h. (004) S. V. O'ROURKE,\* J. E. TANNER, and D. T. STITT. Becton Dickinson Microbiol. Systems, Hunt Valley, Md.
- C253. Is 2% NaCl Necessary for Agar Dilution Testing of Oxacillin against Staphylococci? (006) M. B. HUANG,\* C. N. BAKER, and F. C. TENOVER. CDC, Atlanta, Ga.
- C254. Activity of L-Ofloxacin and Other Quinolones against Methicillin-Resistant *Staphylococcus aureus*. (008) J. PATEL,\* J. LENTINO, and C. PACHUCKI. Hines VA Hosp., Hines, Ill.
- C255. Detection of Heterogeneously and Homogeneously Methicillin-Resistant *Staphylococcus aureus*. (010) E. HUCKZO,\* K. DENBLEYKER, D. P. BONNER, R. E. KESSLER, and J. FUNG-TOMC. Bristol-Myers Squibb Co., Wallingford, Conn.
- C256. Comparison of Agar Dilution with the Vitek GPS-TA Susceptibility Card for Detecting High-Level Gentamicin/Streptomycin-Resistant *Enterococcus* spp. (012) K. P. SAWYER,\* C. A. IMPERATRICE, I. NACHAMKIN, and P. H. EDELSTEIN. Univ. of Pennsylvania Med. Ctr., Philadelphia.
- C257. Evaluation of the Updated Vitek GPS-TA Card for Detection of High-Level Aminoglycoside Resistance in Enterococci. (014) J. E. BLAZEK,\* J. J. GENTILE, and T. K. SHIKASHIO. Dept. of Veterans Affairs Med. Ctr., Univ. of Rhode Island, Roger Williams Med. Ctr., and Brown Univ., Providence.
- C258. Incidence and Detection of High-Level Resistance to Aminoglycosides in Ampicillin-Resistant *Enterococcus faecium*. (016) L. J. HARRELL,\* J. J. THORPE, and L. B. RELLER. Duke Univ. Med. Ctr., Durham, N.C.
- C259. Prevalence of High-Level Resistance to Gentamicin, Kanamycin, and Streptomycin among Enterococci in Brazil. (018) V. L. C. MERQUIOR,\* C. S. STERN, M. G. S. CARVALHO, and L. M. TEIXEIRA. Inst. of Microbiol., Federal Univ., Rio de Janeiro, R.J., Brazil.
- C260. *Enterococcus faecalis* and *Enterococcus faecium* Resistance Patterns, Mexico. (020) S. ESPARZA-AHUMADA,\* R. MORFIN-OTERO, J. HEREDIA-CERVANTES, D. PINTO-TRINDADE, J. J. RODRIGUEZ-CHAGOLLAN, and E. RODRIGUEZ-NORIEGA. Inst. de Patología Infecciosa y Experimental "Dr. Francisco Ruíz Sánchez," Univ. de Guadalajara, Jalisco, Mexico.

- C261. Evaluation of an Agar Screen Plate for the Detection of Vancomycin Resistance in Enterococci. (022) B. M. WILLEY,\* B. N. KREISWIRTH, A. SIMOR, S. R. SCRIVER, Y. FAUR, G. WILLIAMS, and D. E. LOW. Mount Sinai Hosp., Univ. of Toronto, Toronto, Ontario, Canada, and New York City Dept. of Health, New York, N.Y.
- C262. New Vancomycin Disk Diffusion Breakpoints for Enterococci. (024) J. SWENSON,\* M. J. FERRARO, D. F. SAHM, P. CHARACHE, and F. TENOVER. CDC, Atlanta, Ga.; Massachusetts Gen. Hosp., Boston; Univ. of Chicago, Chicago, Ill.; and Johns Hopkins Hosp., Baltimore, Md.
- C263. Methods for Detecting Vancomycin-Resistant *Enterococcus*. (026) M. OEHLER, G. KOENIG, and A. KURITZA.\* Rush-Presbyterian-St. Luke's Med. Ctr., Chicago, Ill.
- C264. Increased Incidence of Vancomycin-Resistant Enterococci in a 499-Bed Acute Care Facility. (028) J. F. BOYLE\* and S. A. SOUMAKIS. Cabrini Med. Ctr., New York, N.Y.
- C265. Evaluation of Vitek and MicroScan for Detection of Vancomycin, Ampicillin, and High-Level Streptomycin and Gentamicin Resistance in Enterococci. (030) B. M. WILLEY,\* B. N. KREISWIRTH, A. SIMOR, S. R. SCRIVER, Y. FAUR, G. WILLIAMS, A. PHILLIPS, M. PATEL, S. SZETO, and D. E. LOW. New York City Dept. of Health, New York, N.Y., and Mount Sinai Hospital, Univ. of Toronto, Toronto, Ontario, Canada.
- C266. Failure of a Rapid Automated System To Predict Ampicillin Susceptibility of Enterococci when Tested with Penicillin. (032) V. ANING,\* S. WILLIAMS, and G. SZILAGYI. A. Einstein Hosp., Bronx, N.Y.
- C267. In Vitro Susceptibility of *Streptococcus pneumoniae* Isolates from Human Immunodeficiency Virus Type 1-Seropositive and Seronegative Patients to 12 Antimicrobial Agents. (034) P. S. NASSOS,\* D. M. YAJKO, C. A. SANDERS, P. C. GONZALEZ, and W. K. HADLEY. Univ. of California, San Francisco Gen. Hosp. Med. Ctr., San Francisco.
- C268. Increased Penicillin Resistance in Recent U.S. Isolates of *Streptococcus pneumoniae*. (036) C. THORNSBERRY,\* J. K. MARLER, and T. J. RICH. Inst. for Microbiol. Res., Franklin, Tenn.
- C269. Restriction Fragment Polymorphisms as Evidence for Clonal Origin of Relatively Penicillin-Resistant Pneumococci from Northwestern Canada. (038) E. SWIATLO,\* J. SHEFFIELD, and D. BRILES. Univ. of Alabama, Birmingham.
- C270. High Rate of Fecal Colonization with Vancomycin-Resistant Gram-Positive Organisms in Hospitalized Adult Patients. (040) B. HOWE, J. SIVALINGAM,\* D. JUNGKIND, D. LANDER, L. CRERAN, and H. FRAIMOW. Thomas Jefferson Univ., Philadelphia, Pa.

### Session 244 (C). ANTIMICROBIAL SUSCEPTIBILITY TEST SYSTEMS: EVALUATIONS

- C271. Rapid Detection of Antimicrobial Resistance to *Enterobacteriaceae*. (042) J. K. HU,\* M. A. PUNJABI, R. J. SAPITOWICZ, and D. T. STITT. Becton Dickinson Microbiol. Systems, Hunt Valley, Md.
- C272. New Rapid Method for Measuring the Effect of Antibiotics on Microorganisms. (044) D. T. STITT,\* J. K. HU, and R. J. SAPITOWICZ. Becton Dickinson Microbiol. Systems, Hunt Valley, Md.
- C273. Multicenter Comparison of Microscan Rapid Gram-Positive Combo Panel 1 and Positive Combo Panel 5 with Conventional Methods for Antimicrobial Susceptibility. (046) B. RAY,\* S. BRUNETT, A. E. CRIST, JR., L. M. JOHNSON, D. F. SAHM, C. CIAGLIA, S. STOCKER, and C.

- BAKER. Baptist Med. Ctr., Oklahoma City, Okla.; Polyclinic Med. Ctr., Harrisburg, Pa.; Univ. of Chicago, Chicago, Ill.; and CDC, Atlanta, Ga.
- C274.** Evaluation of Screening Disk Diffusion Method and Vitek GPS-SA Card for Detection of Oxacillin-Resistant Staphylococci. (048) C. C. KNAPP,\* M. D. LUDWIG, and J. A. WASHINGTON. Cleveland Clin. Fndn., Cleveland, Ohio.
- C275.** Comparison of the Vitek System with the BIOMIC and MicroScan Systems for Antimicrobial Susceptibility Testing of Methicillin-Susceptible, Borderline Susceptible, and Resistant Strains of *Staphylococcus aureus*. (050) J. T. RUDRIK,\* R. L. SAUTTER, P. HNATUCK, L. JOHNSON, A. CRIST, JR., and W. D. LEBAR. Asheville VA Med. Ctr., Asheville, N.C.; Harrisburg Hosp. and Polyclin. Med. Ctr., Harrisburg, Pa.; and Providence Hosp., Southfield, Mich.
- C276.** Rapid Detection of Methicillin-Resistant Isolates of *Staphylococcus* Species with BacT/Alert. (052) K. A. READ\* and T. C. THORPE. Organon Teknika Corp., Durham, N.C.
- C277.** Accurate and Rapid Detection of Methicillin-Resistant *Staphylococcus aureus* by the Vitek Assay Card Using Cefprozime. (054) N. YAMANE\* and M. TOSAKA. Kumamoto Univ. Med. Sch., Kumamoto, Japan.
- C278.** Comparison of the MicroScan MKD MIC and Kirby-Bauer Susceptibility Testing Methods for Gram-Negative Rods Recovered from Bone Marrow Transplant Patients. (056) R. W. SCHWARTZ,\* J. N. MORGENROTH, and D. L. BRAWNER. Fred Hutchinson Cancer Res. Ctr., Seattle, Wash.
- C279.** Pediatric Evaluation of the MicroScan WalkAway for Antimicrobial Susceptibility of Gram-Negative Bacilli Using Conventional Panels. (058) P. LEBEL,\* S. LECLERC, F. HAMEL, and S. MAINVILLE. Hôpital Sainte-Justine and Univ. de Montreal, Montreal, Quebec, Canada.
- C280.** Comparison of MIC (Pasco), Vitek AMS, and Kirby-Bauer Susceptibility Testing of Resistant *Enterobacteriaceae*. (060) E. O'DONNELL,\* T. DONNAL, S. JONES, and M. CULVERHOUSE. Med. Col. of Ohio, Toledo.
- C281.** Automated Microbiology Systems: a Comparison of WalkAway-40 (Baxter MicroScan Division) and autoSCAN-W/A (Baxter MicroScan Division). (062) D. BALLOU,\* D. LIST, P. MATZNER, and J. SALYER. S.E.D. Med. Lab., Albuquerque, N. Mex.
- C282.** Evaluation of the MicroScan AutoScan-W/A for Rapid Bacterial Identification and Susceptibility Testing. (064) J. SNYDER\* and S. LUDE. Univ. of Louisville and Humana Hosp.-Univ. of Louisville, Louisville, Ky.
- C283.** Comparison of Microscan Rapid NEG Combo Type 4 Panel versus API 20E and UniScept MIC Type 3 Panel. (066) M. F. SIERRA,\* E. TOLENTINO, K. G. CLARKE, and C. R. GULLANS. SUNY Health Sci. Ctr., Brooklyn, N.Y.
- C284.** Evaluation of a Reformatted Ceftriaxone Microtiter Susceptibility Panel. (068) R. SCHWALBE\* and A. HYMAN. Univ. of Maryland Med. Ctr., Baltimore.
- C285.** Reproducibility of MIC Results by Colorimetric Susceptibility Method. (070) J. LEWIS,\* S. KILLIAN, J. KIHARA, S. JENKINS, and M. LANCASTER. Baptist Med. Ctr., Jacksonville, Fla., and Alamar, Sacramento, Calif.
- C286.** Comparison of the BIOMIC Antimicrobial Susceptibility Test System with the Vitek System for MIC Testing. (072) T. L. WOLFRAM,\* C. R. MCFARLAND, and J. A. POU-PARD. St. Joseph Hosp., Reading, Pa.; Pottstown Mem. Med. Ctr., Pottstown, Pa.; and SmithKline Beecham, King of Prussia, Pa.
- C287.** Radial Analysis Algorithm: an Automatic Interpretation of Disk Diffusion Antibiotic Susceptibility Tests. (074) C. RICA, G. HEJBLUM, V. JARLIER,\* J. GROSSET, and A. AURENGO. Unité INSERM 194 and Lab. de Bacteriol., Pitié-Salpêtrière Sch. of Med., Paris, France.
- C288.** Evaluation of Sensititre MIC Panels for the Susceptibility Testing of Meropenem, a New Carbapenem. (076) M. DOWZICKY,\* H. NADLER, E. GRAVES, and W. SHEIKH. ICI Pharmaceutical Group, Wilmington, Del.
- C289.** Direct Susceptibility Testing from Positive Blood Culture Using the Microscan Walkaway. (078) A. R. WANGER,\* L. Y. ARMITIGE, and K. GOODRICH. Univ. of Texas Med. Sch., Houston.
- C290.** Use of Flashtrack for Rapid, Direct Susceptibility Testing in Blood Culture. (080) D. FULLER,\* T. DAVIS, P. LINEBACK, and J. BRICKLER. Wishard Mem. Hosp.-Indiana Univ. Med. Ctr., Indianapolis.
- C291.** Direct Susceptibility Testing of Streptococcal and Enterococcal Blood Culture Isolates Using Serum Separator Tubes and the Vitek System. (082) L. HARRISON and W. NAUSCHUETZ.\* Brooke Army Med. Ctr., Fort Sam Houston, Tex.
- C292.** Ciprofloxacin Susceptibility Testing by MIC and Disk Elution of Drug-Resistant *Mycobacterium tuberculosis*. (084) V. J. LABOMBARDI\* and L. CATALDO-CAPUTZAL. St. Vincent's Med. Ctr., New York, N.Y.
- C293.** Comparative Susceptibility of *Mycobacterium avium* Complex as Determined by Recombinant DNA Probe and Agar Dilution Techniques. (086) T. LAWRENCE,\* N. CORRIERE, and D. AMSTERDAM. Erie County Med. Ctr. and Univ. at Buffalo, Buffalo, N.Y.

### Session 245 (B). STREPTOCOCCI AND STAPHYLOCOCCI: VIRULENCE FACTORS AND ANIMAL MODELS OF INFECTION

- B226.** Virulence of *Streptococcus mutans* V403 in Model Systems of Endocarditis. (088) C. MUNRO\* and F. L. MACRINA. Virginia Commonwealth Univ., Richmond.
- B227.** Neonatal Mouse Model of Group B Streptococcal Infection. (090) A. RODEWALD,\* A. ONDERDONK, H. WARREN, and D. KASPER. Channing Lab., Brigham and Women's Hosp., Div. of Infectious Diseases, Beth Israel Hosp., and Dept. of Med. and Dept. of Pathology, Harvard Med. Sch., Boston, Mass.
- B228.** Resistance of Oral Streptococci to Lectin-Mediated Bactericidal Activity of Polymorphonuclear Leukocytes: Potential Virulence Determinant for Endocarditis. (092) S. Y. LEE,\* A. L. SANDBERG, J. O. CISAR, J. L. BRYANT, and M. ECKHAUS. NIH, Bethesda, Md.
- B229.** Modification of Host Cellular Immunocompetence: Relationship to Outcome of Viridans Streptococcal Endocarditis. (094) L. DALL, B. HERNDON,\* J. THOMAS, and R. SMITH. Univ. of Missouri, Sch. of Med., Kansas City.
- B230.** Characterization of Glycocalyx and Endocarditis-Producing Viridans Group Streptococci. (096) L. DALL,\* B. HERNDON, and R. SMITH. Univ. of Missouri, Sch. of Med., Kansas City.
- B231.** In Vitro Phagocytosis of Type Ia Group B Streptococci by Natural Cytotoxic Effectors Induced In Vivo by Inactivated *Candida albicans*. (098) L. TISSI, L. SCARINGI, P. CORNACCHIONE, E. ROSATI, M. L. ROSSODIVITA, C. VON HUNOLSTEIN, G. OREFICI, and P. MARCONI.\* Univ. of Perugia, Perugia, Italy, and Istituto Superiore di Sanità, Rome, Italy.
- B232.** Pyrogenic Exotoxin A-Producing *Streptococcus pyogenes* Isolates Are Unusually Virulent in a Murine Model of Cutaneous Infection. (100) N. BARG,\* L. WHEELER, and J. M. MUSSER. Vanderbilt Univ. Med. Sch., Nashville, Tenn., and Baylor Col. of Med., Houston, Tex.
- B233.** Contribution of the pADI-Encoded Cytolysin to the Severity of Experimental *Enterococcus faecalis* Endophthalmi-

- tis. (102) B. D. JETT,\* H. G. JENSEN, and M. S. GILMORE. Univ. of Oklahoma Health Sci. Ctr., Oklahoma City.
- B234.** Effect of Pneumolysin on Blood Levels of *Streptococcus pneumoniae*. (104) K. A. BENTON\* and D. E. BRILES. Univ. of Alabama, Birmingham.
- B235.** Ethanol Impairs Neutrophil Chemotaxis but Not Adherence or Recruitment to Lungs in Rats with Experimental Pneumococcal Pneumonia. (106) P. D. LISTER,\* L. C. PREHEIM, and M. J. GENTRY. Infectious Diseases Sect., VA Med. Ctr., Creighton Univ. Sch. of Med., Omaha, Nebr.
- B236.** Host Assistance in the Bactericidal Effect of Cefotaxime in the Experimental Model of Pneumococcal Meningitis. (108) P. COTTAGNOUD\* and A. TOMASZ. Rockefeller Univ., New York, N.Y.
- B237.** Animal Model of Postoperative Suppurative Craniofacial Infection. (110) J. FIALKOV,\* S. WALMSLEY, W. MARSHALL, and J. PHILLIPS. Dept. of Surgery and Dept. of Microbiol., Sunnybrook Health Sci. Ctr., Univ. of Toronto, Toronto, Ontario, Canada.
- B238.** Biocompatibility and Resistance to Infections of Teflon and Ceramic Implants. (112) A. F. WIDMER,\* P. E. OCHSNER, and W. ZIMMERLI. Univ. Hosp., Basel, Switzerland, and Kantonsspital Liestal, Liestal, Switzerland.
- B239.** Transposon-Mediated Loss of Polysaccharide/Adhesin and Slime Production by *Staphylococcus epidermidis* Decreases In Vitro Adherence but Not In Vivo Persistence in an Experimental Foreign Body Infection. (114) E. MULLER,\* D. GOLDMANN, and G. B. PIER. Channing Lab., Brigham and Women's Hosp., and Children's Hosp., Harvard Med. Sch., Boston, Mass.
- B240.** Relationship between Cutaneous Persistence in Natural Populations of Coagulase-Negative Staphylococci and Their Ability to Produce Catheter Infections, Biofilm, and Polysaccharide Adhesin. (116) W. E. KLOOS,\* H. A. BERKHOFF, E. MULLER, T. L. BANNERMAN, and D. N. BALLARD. North Carolina State Univ., Raleigh, and Channing Lab., Harvard Univ., Boston, Mass.
- B241.** Comparison of Qualitative and Quantitative Methods of Slime (Glycocalyx) Production by *Staphylococcus epidermidis* Isolated from Indwelling Vascular Catheters. (118) N. KHARDORI,\* T. KARICH, and K. WILSON. Southern Illinois Univ. Sch. of Med., Springfield.
- B242.** Isolation and Characterization of a Virulent *Staphylococcus* and a Symbiotic Yeast. (120) V. A. ZIEMBA\* and S. T. KELLOGG. Dept. of Bacteriol. and Biochemistry, Univ. of Idaho, Moscow.
- B243.** Platelet Microbicidal Protein Enhances Postantibiotic Effects and Antibiotic Uptake in *Staphylococcus aureus*. (122) M. R. YEAMAN,\* D. C. NORMAN, and A. S. BAYER. Harbor-UCLA Med. Ctr., Torrance, Calif., and West Los Angeles VA Med. Ctr., Los Angeles, Calif.
- B244.** Serological Response to Pericatheter-Inoculated *Staphylococcus epidermidis* RP62A in a Porcine Continuous Ambulatory Peritoneal Dialysis Model. (124) K. P. MCDERMID,\* D. W. MORCK, A. E. KHOURY, M. K. DASGUPTA, and M. E. OLSON. Dept. of Biol., Univ. of Calgary, Calgary, Alberta, Canada; Dept. of Urology, Sick Children's Hosp., Toronto, Ontario, Canada; and Dept. of Immunology and Nephrology, Univ. of Alberta, Edmonton, Alberta, Canada.
- B245.** In Vitro Characteristics That Predict Virulence of *Staphylococcus epidermidis*. (126) R. SMITH,\* B. HERNANDON, and L. DALL. Univ. of Missouri Sch. of Med., Kansas City.
- B246.** Characterization of a Persistent, Intracellular *Staphylococcus aureus* Small-Colony Variant. (128) J. M. BALWIT,\* D. W. BRAR, G. PETERS, and R. A. PROCTOR. Dept. of Med. Microbiol., Univ. of Wisconsin, Madison, and Hygiene Inst., Univ. zu Köln, Köln, Germany.
- B247.** Plasmid Contribution to Virulence in Methicillin-Resistant *Staphylococcus aureus*. (130) S. D. NORTHROP, G. P. HARDING, and A. J. ZUCCARELLI.\* Loma Linda Univ., Loma Linda, Calif.
- B248.** Analysis of the Contribution of Immunomodulating Activities to the Development of Lethal Toxic Shock-Like Syndrome. (132) B. A. B. LEONARD,\* A. PODBIELSKI, and P. M. SCHLIEVERT. Univ. of Minnesota, Minneapolis.
- B249.** Effect of a Surfactant, Pluronic L92, on Toxic Shock Syndrome Toxin 1 Production in Model Toxic Shock Syndrome. (134) M. MELISH, S. MURATA,\* C. FUKUNAGA, K. FROGNER, L. MATSUDA, and D. COLE. Univ. of Hawaii, Honolulu.
- B250.** Influence of Aspirin on Development of Experimental Endocarditis Due to *Staphylococcus aureus*. (136) D. P. NICOLAU, C. D. FREEMAN, C. H. NIGHTINGALE,\* R. QUINTILIANI, C. COE, E. G. MADERAZO, and B. W. COOPER. Hartford Hosp., Hartford, Conn.

### Session 246 (B). STREPTOCOCCI AND STAPHYLOCOCCI: SURFACE PROTEINS AND EXTRACELLULAR COMPONENTS

- B251.** Role of M Protein in Aggregation of Group A Streptococci by Metals. (138) H. S. COURTNEY\* and D. L. HASTY. Veterans Affairs Med. Ctr. and Univ. of Tennessee, Memphis.
- B252.** A Novel Multifunctional Surface Protein (MF6) of Group A Streptococci. (140) V. PANCHOLI\* and V. A. FISCHETTI. Rockefeller Univ., New York, N.Y.
- B253.** M12 Protein from *Streptococcus pyogenes* Has Immunoglobulin G3 Binding Activity. (142) D. RETNONINGRUM,\* A. PODBIELSKI, and P. CLEARY. Univ. of Minnesota, Minneapolis.
- B254.** Analysis of Group G Streptococcal M Protein Genes. (144) A. KIMURA, H. LAMAN, A. L. BISNO, and C. M. COLLINS.\* Univ. of Miami and VA Med. Ctr., Miami, Fla.
- B255.** Evidence for Two Antigenic Classes of Immunoglobulin G-Binding Proteins Expressed by Group A Streptococci. (146) R. RAEDER,\* R. A. OTTEN, and M. D. P. BOYLE. Med. Col. of Ohio, Toledo.
- B256.** A Recombinant Fibronectin-Binding Protein of Group A Streptococci Mediates Their Adherence to Epithelial Cells. (148) P. VALENTIN-WEIGAND,\* S. R. TALAY, K. N. TIMMIS, and G. S. CHHATWAL. Technical Univ./GBF, Braunschweig, Germany.
- B257.** Fibronectin Binding Protein of *Streptococcus pyogenes*: Sequencing of the Binding Domain and Overexpression of Active Fusion Protein. (150) S. R. TALAY,\* K. N. TIMMIS, and G. S. CHHATWAL. Technical Univ./GBF, Braunschweig, Germany.
- B258.** Analysis of the Gene Encoding a Group A Streptococcal Plasmin Receptor. (152) S. B. WINRAM,\* S. J. KAIN, B. L. SCHROEDER, G. D. GORDON, and R. LOTTENBERG. Univ. of Florida, Gainesville.
- B259.** Plasminogen Activation and Capture of Plasmin by Pathogenic Group A Streptococci. (154) H. WANG\* and M. D. P. BOYLE. Dept. of Microbiol., Med. Col. of Ohio, Toledo.
- B260.** Molecular Characteristics of Adhesins from Group B Streptococci. (156) G. TAMURA,\* S. SMITH, and C. RUBENS. Children's Hosp. and Med. Ctr., Seattle, Wash.
- B261.** Nucleotide Sequence Analysis of the C Protein Alpha Antigen of Group B *Streptococcus*. (158) J. I. MICHEL,\* L. C. MADOFF, K. J. OLSON, D. E. KLING, B. D. BESETH, D. L. KASPER, and F. M. AUSUBEL. Channing Lab.,

Brigham and Women's Hosp., and Massachusetts Gen. Hosp., Boston.

- B262.** Purification of Collagenase from Group B Streptococci. (160) C. M. STROM\* and D. V. LIM. Univ. of South Florida, Tampa.
- B263.** Degradation of Amniotic Collagen Fibrils by Group B Streptococci. (162) R. J. JACKSON,\* K. L. GATES, R. J. SHERIDAN, and D. V. LIM. Univ. of South Florida, Tampa.
- B264.** Role of Sialyltransferase in Serum-Mediated Sialylation of Group B *Streptococcus*. (164) M. W. PLATT\* and N. CORREA. Univ. of New Mexico, Sch. of Med., Albuquerque.
- B265.** Characterization of Functionally Distinct Streptokinases from Group C Streptococci. (166) H. E. MCCOY, S. T. NOWICKI,\* D. MINNING-WENZ, K. H. JOHNSTON, and R. LOTTENBERG. Univ. of Florida, Gainesville, and Louisiana State Univ. Med. Ctr., New Orleans.
- B266.** Polymorphism of the Internal Variable Domain of Group A Streptokinases and Possible Relation to Poststreptococcal Glomerulonephritis. (168) K. H. JOHNSTON,\* R. C. WHEELER, and C. F. GALLINA. Louisiana State Univ. Med. Ctr., New Orleans.
- B267.** Cloning and Expression in *Escherichia coli* of an Amplified *pspA* Gene of Type 12 PspA from a Capsular Type 14 *Streptococcus pneumoniae*. (170) L. S. MCDANIEL,\* C. K. STOVER, and D. O. MCDANIEL. Univ. of Alabama, Birmingham, and Medimmune, Inc., Gaithersburg, Md.
- B268.** Mapping Protection-Eliciting Epitopes of Pneumococcal Surface Protein A (PspA). (172) B. A. CAIRNS,\* D. E. BRILES, and L. S. MCDANIEL. Univ. of Alabama, Birmingham.
- B269.** Inhibition of Sucrose-Induced Fructosyltransferase Gene Expression in *Streptococcus mutans*. (174) K. M. MONROE\* and M. C. HUDSON. Univ. of North Carolina, Charlotte.
- B270.** Conserved Acidic Residues Mediate Ligand Binding by *Staphylococcus aureus* and *Streptococcus dysgalactiae* Fibronectin Receptors. (176) S. GURUSIDDAPPA,\* M. J. MCGAVIN, P.-E. LINDGREN, and M. HOOK. Univ. of Alabama, Birmingham, and Swedish Univ. of Agricultural Sci., Uppsala, Sweden.
- B271.** Regulation of Exoprotein Expression in *Staphylococcus aureus* by a Locus (*sar*) Distinct from *agr*. (178) A. CHEUNG,\* J. KOOMEY, C. BUTLER, S. PROJAN, and V. FISCHETTI. Rockefeller Univ. and Publ. Health Res. Inst., New York, N.Y.
- B272.** Isolation of Collagen Adhesin-Deficient Mutants of *Staphylococcus aureus* by Allelic Replacement. (180) J. M. PATTI,\* D. KRAJEWSKA-PIETRASIK, and M. HOOK. Univ. of Alabama, Birmingham.
- B273.** Attachment of the FnBPA Fibronectin Receptor of *Staphylococcus aureus* to Fibronectin Fragments. (182) M. J. MCGAVIN,\* T. KOSTIAINEN, and M. HOOK. Dept. of Biochemistry, Univ. of Alabama, Birmingham.
- B274.** Effect of Specific Growth Rate upon the Surface Properties of *Staphylococcus epidermidis* Biofilms and Their Production of Extracellular Virulence Factors. (184) E. EVANS,\* M. R. W. BROWN, and P. GILBERT. Dept. of Pharmacy, Manchester Univ., Manchester, U.K., and Pharmaceutical Sci. Inst., Aston Univ., Birmingham, U.K.
- B275.** Iodine Exposure and Slime Production in Coagulase-Negative Staphylococci. (186) R. AGAH,\* R. SHERMAN, I. FLIONIS, and L. THRUPP. Univ. of California-Irvine, Orange.

## Session 247 (D). STREPTOCOCCI, ENTEROCOCCI, AND STAPHYLOCOCCI

- D179.** Sequence Homology at the Amino Termini of M Proteins of *Streptococcus pyogenes*: Possible Mechanisms for Antigenic Diversity. (188) W. A. RELF\* and K. S. SRIPRAKASH. Menzies Sch. of Health Res., Casuarina, NT, Australia.
- D180.** M-Protein Gene Typing of *Streptococcus pyogenes* by Nonradioactively Labeled Oligonucleotide Probes. (190) A. KAUFHOLD,\* A. PODBIELSKI, D. R. JOHNSON, and E. L. KAPLAN. Technical Univ. Aachen, Aachen, Germany, and Univ. of Minnesota, Minneapolis.
- D181.** Interaction of Streptococcal M Protein with Cultured Human Epithelial Cells. (192) J. R. WANG\* and M. W. STINSON. SUNY at Buffalo, Buffalo, N.Y.
- D182.** Cloning and Sequencing of the Gene Encoding the Serum Opacity Factor of *Streptococcus pyogenes*. (194) J. V. RAKONJAC\* and V. PANCHOLI. Rockefeller Univ., New York, N.Y.
- D183.** Cloning, Sequencing, and Molecular Analysis of Streptococcal A-FF22, a Lantibiotic Produced by Certain Strains of *Streptococcus pyogenes*. (196) W. L. HYNES,\* J. J. FERRETTI, and J. R. TAGG. Univ. of Oklahoma Health Sci. Ctr., Oklahoma City, and Univ. of Otago, Dunedin, New Zealand.
- D184.** Cysteine Proteinase of Group A Streptococci. (198) J. COONEY,\* C.-L. LIU, and L. BJORCK. Lund Univ., Lund, Sweden.
- D185.** Analysis of the C-Protein Antigens of Group B Streptococci with Particular Emphasis on the  $\gamma$  and  $\delta$  Antigens. (200) L. J. BRADY,\* D. A. PIACENTINI, R. J. JACKSON, and K. L. GATES. Univ. of Florida, Gainesville, and Univ. of South Florida, Tampa.
- D186.** Rapid Detection of Group B Streptococci in Obstetric Patients by a DNA Probe. (202) P. CLARK,\* M. YANCEY, T. ARMER, and P. DUFF. Dept. of Obstetrics-Gynecology, Univ. of Florida, Gainesville.
- D187.** Novel Attachment Mechanism of a Gram-Positive Surface Protein from *Streptococcus pneumoniae*. (204) J. YOTHER. Univ. of Alabama, Birmingham.
- D188.** Protein Fusions Encoded by the DNA of *Streptococcus pneumoniae* Inserted Upstream from the Alkaline Phosphatase Gene of *Escherichia coli* Are Exported in Both Species. (206) B. J. PEARCE\* and H. R. MASURE. Rockefeller Univ., New York, N.Y.
- D189.** Secretion of PspA-CTB Fusion Products from *Streptococcus pneumoniae* and *Escherichia coli*. (208) J. YOTHER and M. T. DERTZBAUGH.\* Univ. of Alabama, Birmingham, and U.S. Army Med. Res. Inst. of Infectious Disease, Ft. Detrick, Frederick, Md.
- D190.** Isolation and Characterization of *Streptococcus pneumoniae* Group 19 Pneumolysin Gene. (210) S. D. BANKS\* and C. J. LEE. Ctr. for Biol. Evaluation and Res., FDA, Bethesda, Md.
- D191.** Isolation and Purification of a Species-Specific Protein from *Streptococcus pneumoniae* by Isoelectric Focusing and Continuous-Elution Electrophoresis. (212) H. RUSSELL\* and J. A. THARPE. CDC, Atlanta, Ga.
- D192.** Identification and Characterization of a Surface Protein-Releasing Enzyme in *Streptococcus mutans* and Other Pathogenic Streptococci. (214) S. F. LEE. Univ. of Manitoba, Winnipeg, Manitoba, Canada.
- D193.** Analysis of the *Streptococcus defectivus* Adhesin That Mediates Extracellular Matrix Adherence. (216) R. C. TART\* and I. VAN DE RIJN. Wake Forest Univ. Med. Ctr., Winston-Salem, N.C.
- D194.** Structural and Immunological Studies of Viridans Streptococci Cell Wall Proteins. (218) J. B. COCHRAN,\* C. C. PATRICK, S. V. HETHERINGTON, and J. L. SHENEP. St



Jude Children's Res. Hosp. and LeBonheur Children's Med. Ctr., Memphis, Tenn.

- D195.** Complementation of *Escherichia coli* Auxotrophic Mutants with Enterococcal DNA. (220) B. E. MURRAY, K. V. SINGH,\* and G. M. WEINSTOCK. Univ. of Texas Med. Sch., Houston.
- D196.** High-Resolution Visualization by Cryo-LVSEM and Functional Analysis of Surface Proteins on *Enterococcus faecalis*. (222) S. B. OLMSTED,\* S. L. ERLANDSEN, and C. L. WELLS. Univ. of Minnesota Sch. of Med., Minneapolis.
- D197.** Electrophoretic Whole-Cell Protein Profiles of *Enterococcus* Species. (224) V. L. C. MERQUIOR, J. M. PERALTA, R. R. FACKLAM, and L. M. TEIXEIRA.\* Inst. of Microbiol., Federal Univ., Rio de Janeiro, R.J., Brazil, and CDC, Atlanta, Ga.
- D198.** Restriction Enzyme Mapping of Coagulase-Negative *Staphylococcus* and Its Epidemiological Implications. (226) M. M. STUPART,\* O. K. KASSIM, and A. DAY. Howard Univ., Washington, D.C.
- D199.** Slime Production by Coagulase-Negative Staphylococci with Various Antibiotic Resistance Phenotypes. (228) B. COOPER,\* A. KRUSELL, M. MAZENS-SULLIVAN, J. DEVIVO, and A. EITEL. Hartford Hosp., Hartford, Conn., and Univ. of Connecticut, Farmington.
- D200.** Slime Production in Ocular Isolates of *Staphylococcus epidermidis*. (230) S. HOGER,\* E. HARRIS, A. FOLKENS, and B. SCHLECH. Alcon Lab., Inc., Fort Worth, Tex., and Texas Col. of Osteopathic Med., Fort Worth.
- D201.** Molecular Characterization of a *Staphylococcus aureus* Gene Encoding a Peptidoglycan Hydrolase Activity. (232) X. WANG,\* B. J. WILKINSON, N. MANI, and R. K. JAYASWAL. Dept. of Biol. Sci., Illinois State Univ., Normal.
- D202.** Detection of *femA* (Factor Essential for Methicillin Resistance) in Different Staphylococcal Species by Polymerase Chain Reaction and Hybridization Analysis. (234) S. UNAL,\* J. FLOKOWITSCH, J. HOSKINS, D. A. PRESTON, and P. L. SKATRUD. Lilly Res. Lab., Eli Lilly & Co., Indianapolis, Ind., and Infectious Diseases, New England Deaconess Hosp., and Harvard Med. Sch., Boston, Mass.

## Session 248 (Q). BIODEGRADATION OF CHLORINATED ALKANES AND ALKENES

- Q270.** Reductive Biotransformation of Tetrachloroethylene by a DCB-1 Biofilm Reactor. (236) B. Z. FATHEPURE\* and J. M. TIEDJE. Michigan State Univ., East Lansing.
- Q271.** Adaptation and Reductive Dechlorination in Aquifer Microcosms. (238) S. A. GIBSON,\* S. K. HIGHTOWER, and G. W. SEWELL. Robert S. Kerr Environmental Res. Lab., Ada, Okla.
- Q272.** Dechlorination of Tetrachloroethylene by Methanogenic Granules. (240) L. BHATNAGAR,\* C. KENNES, W.-M. WU, and J. G. ZEIKUS. Michigan Biotechnology Inst., Lansing, and Michigan State Univ., East Lansing.
- Q273.** Transformations of Tetrachloromethane by Live Whole Cells and Cell-Free Extracts from Methanogenic Consortia. (242) S. J. KOMISAR,\* R. P. HERWIG, J. F. FERGUSON, and S. E. STRAND. Dept. of Civil Engineering, Dept. of Microbiol., and Dept. of Forest Resources, Univ. of Washington, Seattle.
- Q274.** Reductive Dechlorination by Aerobic Bacteria under Anoxic Conditions. (244) N. ASSAF-ANID,\* E. A. PETROVSKIS, and T. M. VOGEL. Univ. of Michigan, Ann Arbor.
- Q275.** Methanotrophic and Toluene-Degrading Bacteria: Complementary Degradation of Volatile Halooorganics. (246) R. P. HERWIG,\* S. E. DYKSTERHOUSE, J. J. WALLACE, and

J. T. STALEY. Dept. of Microbiol., Univ. of Washington, Seattle.

- Q276.** Recovery of Soluble Methane Monooxygenase Activity in *Methylosinus trichosporium* OB3b after Exposure to TCE. (248) P. A. BOERMAN and A. V. PALUMBO.\* Environmental Sci. Div., Oak Ridge Nat. Lab., Oak Ridge, Tenn.
- Q277.** Hydrogen as a Reducing Agent for Whole-Cell Methane Monooxygenase Activity in *Methylosinus trichosporium* OB3b. (250) N. N. SHAH,\* R. T. TAYLOR, and M. W. DROEGE. Lawrence Livermore Nat. Lab., Livermore, Calif.
- Q278.** Resistance to Copper Inhibition in Type II Methanotrophic Bacteria. (252) D. W. GRAHAM,\* E. BETTERTON, and R. G. ARNOLD. Univ. of Arizona, Tucson.
- Q279.** Copper-Resistant Mutants of Trichloroethylene-Degrading Bacterium. (254) P. PHELPS,\* S. AGARWAL, G. E. SPEITEL, JR., and G. GEORGIU. Univ. of Texas, Austin.
- Q280.** Transposon Mutagenesis of *Alcaligenes eutrophus* AEO106 and Isolation of Phenol Hydroxylase-Deficient Mutants: Trichloroethylene Degradation by Phenol Hydroxylase. (256) Y. KIM\* and A. R. HARKER. Oklahoma State Univ., Stillwater.
- Q281.** Aerobic Degradation of Trichloroethylene, Vinyl Chloride, and Aromatic Compounds by Type IV Actinomycetes. (258) K. MALACHOWSKY,\* T. J. PHELPS, and D. C. WHITE. Ctr. for Environmental Biotechnology, Univ. of Tennessee, Knoxville.
- Q282.** Field Applications of Biological Reactors Removing Ethylene Dichloride, Trichloroethylene, and Vinyl Chloride from Contaminated Groundwaters. (260) R. PORTIER,\* G. MILLER, D. HOOVER, and R. SIMAR. Louisiana State Univ., Baton Rouge.
- Q283.** Changes in Community Structure and Physiological Status of a Bacterial Consortium during Degradation of Trichloroethylene. (262) S. NOLD,\* L. LACKEY, D. RINGELBERG, and D. WHITE. Ctr. for Environmental Biotechnology, Univ. of Tennessee, Knoxville.
- Q284.** Biodegradation of Chlorinated Alkanes by Soil Microorganisms. (264) L. A. VANDERBERG\* and J. J. PERRY. North Carolina State Univ., Raleigh.
- Q285.** Kinetics of Microbial Growth on 1,2-Dichloroethane of *Xanthobacter autotrophicus* GJ10 and *Ancylobacter aquaticus* AD25 in Chemostats. (266) A. J. VAN DEN WIJNGAARD,\* R. E. DOORNWEERD, R. G. VAN DER KLEIJ, S. KEUNING, and D. B. JANSSEN. Dept. of Biochemistry, Univ. of Groningen, Groningen, The Netherlands.
- Q286.** Novel Aspects of the Transformation of Carbon Tetrachloride by *Pseudomonas* sp. Strain KC. (268) G. TATATA,\* B. FATHEPURE, A. RHODES, and C. CRIDDLE. Ctr. for Microbial Ecology, Michigan State Univ., East Lansing.

## Session 249 (P). CONTROL AND DETECTION OF YEAST, FUNGI, AND BACTERIA IN FOODS

- P50.** Influence of Solutes, Potassium Sorbate, and Incubation Temperature on Lipid Composition of *Zygosaccharomyces rouxii*. (270) D. A. GOLDEN\* and L. R. BEUCHAT. FDA, Washington, D.C., and Univ. of Georgia, Griffin.
- P51.** Comparison of Selective Dye Media versus Conventional Media for Enumerating *Aspergillus* and *Penicillium* spp. in Foods. (272) R. A. HART\* and D. Y. C. FUNG. Kansas State Univ., Manhattan.
- P52.** Evaluation of Solutes for Retarding Colony Development by *Aspergillus amstelodami* on Enumeration Media. (274) L.

- R. BEUCHAT. Food Safety and Quality Enhancement Lab., Dept. of Food Sci. Technology, Univ. of Georgia, Griffin.
- P53.** Cloning and Nucleotide Sequence of a *Leuconostoc* Bacteriocin Operon. (276) J. W. HASTINGS. Univ. of the Western Cape, Cape Town, South Africa.
- P54.** Effect of Bacteriophage Resistance on the Phenotypic and Genotypic Characteristics of *Lactococcus lactis* subsp. *cremoris* FG2. (278) B. C. WEIMER,\* M. BLAKE, A. J. HILLIER, and B. E. DAVIDSON. Univ. of Melbourne, Parkville, Victoria, Australia, and CSIRO Div. of Food Processing, Highett, Victoria, Australia.
- P55.** Effect of a Buffered Propionic Acid Preparation on Controlling Salmonella in Meat and Bone Meal. (280) K. E. NEWMAN\* and V. E. CHANDLER. Alltech Biotechnology Ctr., Nicholasville, Ky.
- P56.** Characterization and Genetic Determinants of Carnobacteriocin Isolated from *Carnobacterium piscicola* LV17A. (282) R. WOROBO,\* T. HENKEL, K. ROY, J. C. VEDERAS, and M. E. STILES. Univ. of Alberta, Edmonton, Alberta, Canada.
- P57.** Characterization and Genetic Determinants of Bacteriocins Produced by *Carnobacterium piscicola* LV17B. (284) L. QUADRI,\* M. SAILER, K. ROY, J. C. VEDERAS, and M. E. STILES. Univ. of Alberta, Edmonton, Alberta, Canada.
- P58.** Stability of Antilisterial Activity of Pediocin AcH and Liposome-Encapsulated Pediocin AcH in Model Beef and Dairy Systems. (286) A. J. DEGNAN,\* N. BUYONG, and J. B. LUCHANSKY. Food Res. Inst., Madison, Wis.
- P59.** A Microbial Hazard Analysis of Ripened and Unripened Cheese Processes. (288) R. ROESKEN\* and L. SCHWARTZ. Univ. of Wisconsin, Green Bay.
- P60.** Outbreak of Toxoplasmosis in a Work Cafeteria in Italy. (290) V. GHISETTI,\* M. VERNEY, R. SERRA, E. GAIDO, A. BARBUI, and G. MARCHIARO. Cl. Microbiol. Dept., Molinette Hosp., Turin, Italy.
- P61.** Effects of Temperature, pH, and Monolaurin against *Listeria monocytogenes*. (292) D. H. OH\* and D. L. MARSHALL. Louisiana State Univ., Baton Rouge.
- P62.** Antibacterial Effect of Avidin-Lysozyme-Conalbumin and Nisin-Lysozyme against *Listeria monocytogenes*. (294) M. C. CIRIGLIANO. T.J. Lipton Co., Englewood Cliffs, N.J.
- P63.** Antimicrobial Properties of Tannic Acid, Propyl Gallate, and Related Compounds. (296) K.-T. CHUNG,\* S. E. STEVENS, JR., W.-F. LIN, and C. I. WEI. Memphis State Univ., Memphis, Tenn., and Univ. of Florida, Gainesville.
- P64.** Enterococci in Pork Processing. (298) L. M. SIEVERDING\* and P. A. HARTMAN. Iowa State Univ., Ames.
- P65.** Characterization of *Psychrobacter* Species from Meat. (300) P. A. GYLES,\* A. WILLIAMS, and B. E. ERIBO. Dept. of Botany, Howard Univ., Washington, D.C.
- P66.** Anaerobic Microbiology of Modified Atmosphere-Packaged Fresh Beef during Extended Refrigerated Storage. (302) R. VENUGOPAL,\* A. R. MCCURDY, G. A. JONES, and S. INGHAM. Univ. of Saskatchewan, Saskatoon, Saskatchewan, Canada.
- P67.** Antigen Capture-Polymerase Chain Reaction of Hepatitis A Virus. (304) L. A. BAEZ,\* J. R. BATTISTA, and R. J. SIEBELING. Louisiana State Univ., Baton Rouge.

## Session 250 (J). MORPHOLOGY AND CELL SURFACES I

- J1.** Adhesion of an Oligosaccharide Fraction of *Lactobacillus fermentum* 104-S to Porcine Squamous Epithelium. (306) A. HENRIKSSON\* and P. L. CONWAY. Univ. of Göteborg, Göteborg, Sweden.
- J2.** Characterization of the S Layer from the Cyanobacterium *Synechococcus* GL24. (308) S. SCHULTZE-LAM,\* G. HA-

- RAUZ, and T. J. BEVERIDGE. Dept. of Microbiol. and Dept. of Molecular Biol. and Genetics, Univ. of Guelph, Guelph, Ontario, Canada.
- J3.** Characterization of Spinax on a Freshwater Green *Chlorobium* sp. (310) J. S. BROOKE, S. F. KOVAL,\* and T. J. BEVERIDGE. Univ. of Western Ontario, London, Ontario, Canada, and Univ. of Guelph, Guelph, Ontario, Canada.
- J4.** Lethal Effects Induced by Linnocucin. (312) M. MOLLER-ACH, A. AMOROSO, A. VEGA, P. BOZZINI, G. GUTKIND,\* and R. A. DE TORRES. Univ. Nacional de Buenos Aires and Inst. Nacional de Microbiol., Buenos Aires, Argentina.
- J5.** Detection of Fc Receptors for Immunoglobulin A on Alveolar Macrophages in Normal and Immunosuppressed Rats. (314) E. PARK,\* C. ITATANI, and G. J. MARSHALL. California State Univ., Long Beach, and Orthopaedic Hosp., Los Angeles, Calif.
- J6.** Electron Microscopic Visualization of Polysaccharide Capsules and Protein Antigens on Whole-Cell Mounts of Group B Streptococci and Pneumococci. (316) B. M. GRAY\* and E. W. COONEY. Univ. of Alabama and EMLabs, Inc., Birmingham.
- J7.** Analysis of Microbial Biofilms Using Scanning Confocal Laser Microscopy. (318) J. R. LAWRENCE, D. R. KORBBER, G. M. WOLFAARDT, and D. E. CALDWELL.\* NHRI, Environment Canada, and Univ. of Saskatchewan, Saskatoon, Saskatchewan, Canada.

## Session 251 (K). GENETIC AND ENZYMATIC REGULATION OF METABOLIC PATHWAYS

- K125.** Enzymatic Basis of Thiol-Stimulated Secretion of Porphyrin in *Escherichia coli*. (320) G. JAVOR\* and E. FEBRE. Loma Linda Univ., Loma Linda, Calif.
- K126.** The *spoT* Mutation Is Permissive to *cya* Mutant Recovery in *Escherichia coli*. (322) F. HANTASH, R. ZSIGRAY, and W. CHESBRO.\* Dept. of Microbiol., Univ. of New Hampshire, Durham.
- K127.** Purification and Investigation of Stress-Induced Expression of the *Escherichia coli* Stringent Starvation Protein. (324) T. X. OUYANG,\* M. D. WILLIAMS, and M. C. FLICKINGER. Dept. of Biochemistry and Inst. for Advanced Studies in Biol. Process Technology, Univ. of Minnesota, St. Paul.
- K128.** Oxidative Glucose Metabolism via the Entner-Doudoroff Pathway in Wild-Type *Escherichia coli* Using Pyrrololquinoline Quinone-Dependent Glucose Dehydrogenase. (326) R. FLIEGE, W. BARNELL, S. TONG, A. SHIBATA, and T. CONWAY.\* Univ. of Nebraska, Lincoln.
- K129.** Physiological Adaptability of a Cyanide-Utilizing *Klebsiella oxytoca* Strain. (328) J.-K. LIU\* and Y.-W. WU. Nat. Sun Yat-sen Univ., Kaohsiung, Taiwan, Republic of China.
- K130.** Isocitrate Lyase Phosphorylation in *Klebsiella aerogenes*. (330) J. C. HOYT\* and H. C. REEVES. Arizona State Univ., Tempe.
- K131.** Metabolic Regulation in *Clostridium acetobutylicum* in Response to Changes in the Overall Degree of Reduction of the Substrate. (332) I. VASCONCELOS, L. GIRBAL, and P. SOUCAILLE.\* INSA, Dept. de Génie Biochimique, Toulouse, France.
- K132.** Genetic Studies of Thiosulfate Reduction by *Salmonella typhimurium*. (334) N. K. HEINZINGER,\* S. TONGKLAN, and E. L. BARRETT. Univ. of California, Davis.
- K133.** Production and Regulation of Sucrase Activity by *Serpulina (Treponema) hyodysenteriae*. (336) N. S. JENSEN\*

and T. B. STANTON. Nat. Animal Disease Ctr., USDA, Agricultural Res. Service, Ames, Iowa.

- K134.** Construction and Characterization of *Streptococcus mutans* Glucosyltransferase I:S Hybrid Enzyme. (338) Y. NAKANO\* and H. K. KURAMITSU. Univ. of Texas Health Sci. Ctr., San Antonio.
- K135.** Suppression of Insertions in the Complex *pxj-dpj* Operon of *Escherichia coli*: K-12 by *lon* and Other Mutations. (340) H.-M. LAM\* and M. E. WINKLER. Dept. of Microbiol. and Molecular Genetics, Univ. of Texas Med. Sch., Houston.
- K136.** Cloning and Genetic and Sequence Analysis of the *thiEFGHJ* Operon of *Escherichia coli*. (342) P. B. VANDER HORN,\* A. D. BACKSTROM, V. STEWART, and T. P. BEGLEY. Dept. of Chemistry and Sect. of Microbiol., Cornell Univ., Ithaca, N.Y.
- K137.** Isolation and Localization of an Anaerobic Regulatory Gene(s) of *Shewanella putrefaciens* MR-1. (344) D. SAFFARINI,\* D. BERMUDES, and K. NEALSON. Ctr. for Great Lakes Studies, Univ. of Wisconsin, Milwaukee.
- K138.** Isolation and Characterization of Iron-Reduction-Deficient Mutants of *Shewanella putrefaciens* 200. (346) T. DI-CHRISTINA\* and E. DELONG. Woods Hole Oceanographic Inst., Woods Hole, Mass.
- K139.** Degradation of 23S rRNA in *Salmonella* spp. (348) D. HSU,\* L. M. SHIH, J. INGRAHAM, and Y. C. ZEE. Univ. of California, San Diego, and Univ. of California, Davis.
- K140.** Expression of the Alternative Pyrimidine Biosynthetic Pathway (*apb*) of *Salmonella typhimurium* during Aerobic Growth. (350) D. M. DOWNS. Univ. of Wisconsin, Madison.
- K141.** Molecular Characterization of the Enolase Gene (*eno*) from *Zymomonas mobilis*. (352) M. E. BURNETT\* and T. CONWAY. Univ. of Nebraska, Lincoln.
- K142.** Construction of Pathways of Thymidine Metabolism Not Normally Present in *Pseudomonas*. (354) D. E. BECK,\* L. E. HUGHES, A. L. CAMPBELL, and G. A. O'DONOVAN. Dept. of Microbiol., Univ. of North Texas, Denton.
- K143.** Fermentation Patterns of a Fumarate-Producing Organism (FIL) Grown in Coculture with *Wolinella succinogenes*. (356) M. FRON\* and D. M. SCHAEFER. Univ. of Wisconsin, Madison.
- K144.** Metabolism of Dimethylsulfoniopropionate and Glycine Betaine by a Marine Bacterium. (358) M. R. DIAZ\* and B. F. TAYLOR. Univ. of Miami, Miami, Fla.
- K145.** Temporal Expression of Lignin Peroxidase and Manganese-Dependent Peroxidase Genes of *Phanerochaete chrysosporium*. (360) K. BOOMINATHAN,\* P. S. NAIDU, T. M. D'SOUZA, and C. A. REDDY. Michigan State University, East Lansing.
- K146.** Cloning of Glutamine Synthetase I from the N<sub>2</sub>-Fixing Actinomycete Symbiont *Frankia*. (362) T. J. HOSTED\* and D. A. ROCHEFORT. Univ. of Connecticut, Storrs.
- K147.** Metabolism of Aspartate by *Frankia* sp. Strain Cp11. (364) X. ZHANG\* and D. R. BENSON. Univ. of Connecticut, Storrs.
- K148.** Identification and Nucleotide Sequence of the *nifA* and *nifB* Genes of *Frankia* sp. Strain Cp11. (366) O. T. HARRIOTT\* and D. R. BENSON. Univ. of Connecticut, Storrs.
- K149.** Analysis of a DNA Fragment That Complements *aut Rhodobacter sphaeroides* KW25/11 to Photolithoautotrophic Growth. (368) G. C. PAOLI\* and F. R. TABITA. Dept. of Microbiol., Ohio State Univ., Columbus.
- K150.** Diauxic Growth of *Azotobacter vinelandii* Grown in Glucose and Galactose Medium. (370) H. PEI, T. Y. WONG, K. BANCROFT, and G. W. CHILDERS.\* Dept. of Biol. Sci., Southeastern Louisiana Univ., Hammond, and Memphis State Univ., Memphis, Tenn.

### Session 252

(Eligible for continuing education credit)

#### J. Roger Porter Award Lecture

(Sponsored by the U.S. Federation for Culture Collections)

### ACTINOMYCETE TAXONOMY: TOWER OF BABEL?

MARY P. LECHEVALIER, Morrisville, Vt.

Friday, 3:30 P.M., Room 26

### Session 252A

(Eligible for continuing education credit)

#### Cetus Corporation Biotechnology Research Award Address

### POLYMERASE CHAIN REACTION

KARY B. MULLIS, La Jolla, Calif.

Friday, 4:45 P.M., Room 27

### Session 253 (V). Seminar

(Eligible for continuing education credit)

### AIDS: INFECTIONS AND DIAGNOSTIC MICROBIOLOGY

(Supported in part by Becton Dickinson Immunocytometry Systems)

Saturday, 8:30 A.M., Ballroom IA

Convenors: MARIO ESCOBAR, Med. Col. of Virginia, Richmond, and HERMAN FRIEDMAN, Univ. of South Florida, Tampa

Introduction and Background

HERMAN FRIEDMAN, Univ. of South Florida, Tampa

Mycoplasma Infections and AIDS

LUC MONTAGNIER, Pasteur Inst., Paris, France

Simian AIDS and Immunity

MICHAEL MURPHEY-CORB, Delta Regional Primate Lab., Covington, La.

Feline Immunodeficiency Virus as a Model for AIDS

MAURO BENDINELLI, Univ. of Pisa, Pisa, Italy

Pediatric AIDS and Infection

JOHN SEVER, Children's Hosp. Med. Ctr., Washington, D.C.

The AIDS Epidemic and Infectious Disease

ROBERT GALLO, NIH, Bethesda, Md.

## BIOREDUCTION OF METALS

Saturday, 8:30 A.M., Room 10

*Moderators:* HENRY L. EHRLICH, Rensselaer Polytechnic Inst., Troy, N.Y., and DEREK R. LOVLEY, U.S. Geological Survey, Reston, Va.

8:30

- Q287.** Aerobic and Anaerobic Reduction of  $MnO_2$  with Acetate by Marine Bacterial Strain BIII 88: a Surface Phenomenon. H. L. EHRLICH, Rensselaer Polytechnic Inst., Troy, N.Y.
- Q288.** Enzymatic Reduction of Uranium by *Desulfovibrio desulfuricans*. D. R. LOVLEY,\* E. J. P. PHILLIPS, and P. G. WIDMAN. Water Resources Div., U.S. Geological Survey, Reston, Va.
- Q289.** Bioremediation of Uranium-Contaminated Waters and Soils with Microbial U(VI) Reduction. D. R. LOVLEY, E. J. P. PHILLIPS,\* and P. K. WIDMAN. Water Resources Div., U. S. Geological Survey, Reston, Va.
- Q290.** Transformations of Uranium by *Clostridium* sp.: Speciation Studies by X-Ray Absorption Near Edge Spectroscopy and X-Ray Photo Electron Spectroscopy. C. J. DODGE, A. J. FRANCIS,\* F. LU, G. HALADA, and C. CLAYTON. Brookhaven Nat. Lab, Upton, N.Y., and SUNY, Stony Brook, N.Y.

9:30

- Q291.** Anaerobic Bioreduction of Toxic Hexavalent Chromium in Enrichment Cultures from Soil Samples. R. MELO OLIVEIRA,\* P. J. EVANS, and L. Y. YOUNG. NYU Med. Ctr., New York, N.Y.
- Q292.** Cr III Binding and Cr VI Reduction in Bacteria Isolated from Soil. M. M. E. HUYBRECHTS,\* S. M. GONZALES, and L. L. BARTON. Dept. of Biol., Univ. of New Mexico, Albuquerque.
- Q293.** Description of a Freshwater Selenate-Respiring Bacterium. R. S. OREMLAND,\* J. SWITZER BLUM, C. W. CULBERTSON, P. BLUNDEN, and L. MILLER. U.S. Geological Survey, Menlo Park, Calif.
- Q294.** Bioremediation of Selenate and Selenite by *Pseudomonas stutzeri* JB1. J. M. BARNES,\* J. K. POLMAN, and J. H. MCCUNE. Idaho Nat. Engineering Lab., EG&G Idaho, Inc., Idaho Falls.

10:30

- Q295.** Coupled Reduction of Metal-Organic Pollutants by a Pb-Resistant Bacterium Isolated from a Mixed-Microbial Ecosystem. V. IBEANUSI\* and E. ARCHIBOLD. Spelman Col. and Morehouse Col., Atlanta, Ga.

## BIODEGRADATION AND BIOREMEDIATION

Saturday, 8:30 A.M., Room 12

*Moderators:* ROBERT R. CHRISTIAN, East Carolina Univ., Greenville, N.C., and TIMOTHY B. PARKIN, USDA, ARL, NSTL, Ames, Iowa

8:30

- N93.** Spatial and Temporal Variability of Carbofuran Degradation in Soil. T. B. PARKIN. USDA, Agricultural Res. Service, National Soil Tilth Lab., Ames, Iowa.
- N94.** Iron Cycle during Bioleaching of Aerobically Digested Sewage Sludges Using *Thiobacillus ferrooxidans*. R. LA-FLEUR, R. GUAY, R. LETARTE,\* and D. COUILLARD. INRS-Eau and Univ. Laval, Ste-Foy, Quebec, Canada.
- N95.** Metal Binding to Algal Phytochelatins. P. L. SPERL and G. T. SPERL.\* Geo-Microbial Technologies, Inc., Okelata, Okla.
- N96.** Assessment of the Role of Sulfate-Reducing Bacteria in Anoxic Wetlands Constructed To Treat Acid Mine Drainage. K. N. DUDDLESTON,\* J. L. NEAL, and A. C. HENDRICKS. Virginia Polytechnic Inst. and State Univ., Blacksburg.

9:30

- N97.** Natural Oil Biodegradation in a 15-Year-Old Alaskan Tundra Spill. J. B. CARNAHAN\* and E. J. BROWN. Univ. of Alaska, Fairbanks.
- N98.** Marine Fungi: Potential Catalysts for Bioremediation of Oil Spills. J. J. COONEY,\* M. M. DOOLITTLE, S. WUERTZ, M. E. MILLER, and C. BAISDEN. Univ. of Massachusetts, Boston.
- N99.** Enhanced Biodegradation of Petroleum in Subarctic Soils. L. RAWLS-MCAFEE\* and E. J. BROWN. Univ. of Alaska, Fairbanks.
- N100.** Method for On-Site Detoxification of Hazardous Parathion Residues in Rinseates and Containers. T. P. STEFFENS\* and R. L. CRAWFORD. Univ. of Idaho and Ctr. for Hazardous Waste Remediation Res., Moscow.

10:30

- N101.** Biotreatment of Herbicide Containers and Rinse Waters. J. HULTMAN\* and R. L. CRAWFORD. Ctr. for Hazardous Waste Remediation Res., Univ. of Idaho, Moscow.

## Session 256 (AAM), Round Table

(Eligible for continuing education credit)

## CROSS-INFECTION RISKS IN DENTISTRY

Saturday, 8:30 A.M., Room 14

*Convenors:* DAVID L. LEWIS, Univ. of Georgia, Athens, and JOHN YOUNG, Univ. of Texas, San Antonio

Risks of cross-infecting dental patients via equipment potentially serving as fomites for human immunodeficiency virus, hepatitis B virus, and various bacterial pathogens will be

addressed. Discussions will focus on equipment that is difficult to clean and disinfect, i.e., high- and low-speed handpieces and their attachments (prophyngles and burs). Participants will summarize the current state of knowledge of cross-infection in dentistry as well as what additional research and epidemiological studies are needed.

**Participants:** CHRIS MILLER, JAMES CRAWFORD, ROBERT KOLSTAD, WALTER BOND, and TIMOTHY A VIATOWSKI

### Session 257 (B)

## POLYSACCHARIDES AND LIPOPOLYSACCHARIDES OF BACTERIAL PATHOGENS: IMMUNOCHEMISTRY AND GENETICS

Saturday, 8:30 A.M., Room 43

**Moderators:** THOMAS INZANA, Virginia Technical Inst. and State Univ., Blacksburg, and IVO VAN DE RIJN, Bowman Gray Sch. of Med., Winston-Salem, N.C.

8:30

- B276.** *Vibrio vulnificus* Has Multiple Capsular Types. C. K. HAYAT,\* G. P. PEDDY, A. C. WRIGHT, A. E. FIORE, A. JOSEPH, C. A. BUSH, and J. G. MORRIS, JR. Div. of Geographic Med., Univ. of Maryland Sch. of Med., and Dept. of Chemistry and Biochemistry, Univ. of Maryland, Baltimore.
- B277.** Frequency of Encapsulated versus Unencapsulated Strains of Non-O1 *Vibrio cholerae* Isolated from Patients with Septicemia or Diarrhea or from Environmental Sources. J. A. JOHNSON,\* A. JOSEPH, P. PANIGRAHI, and J. G. MORRIS, JR. Univ. of Maryland Sch. of Med., Baltimore.
- B278.** Effect of Environmental Conditions on Expression of a Capsule-Related Gene in *Vibrio vulnificus*. L. M. SIMPSON\* and A. C. WRIGHT. Univ. of North Carolina, Charlotte, and Univ. of Maryland Med. Sch., Baltimore.
- B279.** Role of Capsule and Antibody in the Serum Resistance of *Actinobacillus pleuropneumoniae*. C. MELNIK\* and T. INZANA. Col. of Vet. Med., Virginia Polytechnic Inst., Blacksburg.

9:30

- B280.** Clustering of Genes Involved in the Production of Capsule in *Staphylococcus aureus*. M. C. Y. LEE. Univ. of Kansas Med. Ctr., Kansas City.
- B281.** Nontypeable NT 6 Group B *Streptococcus*: Pathogenicity and Immunochemical Characterization of Capsular Polysaccharide. C. VON HUNOLSTEIN,\* S. D'ASCENZI, J. JELINKOVA, S. RECCHIA, G. ALFARONE, I. PARISI, F. CRESCENZI, and G. OREFICI. Istituto Superiore di Sanita, Rome, Italy, and Inst. of Hygiene and Epidemiology, Prague, Czechoslovakia.
- B282.** Molecular Characterization of a Locus Required for Hyaluronate Capsule Production in Group A Streptococci. B. A. DOUGHERTY\* and I. VAN DE RIJN. Wake Forest Univ. Med. Ctr., Winston-Salem, N.C.
- B283.** Sequence Analysis of the Type III Group B Streptococcal Capsule Genes. L. M. HEGGEN,\* C. E. RUBENS, and M. R. WESSELS. Children's Hosp. and Med. Ctr., Seattle, Wash., and Channing Lab., Brigham and Women's Hosp., Boston, Mass.

10:30

- B284.** Identification of the GDP Mannose Biosynthesis Genes Encoded by the O7 Lipopolysaccharide *rfb* Region of *Escherichia coli* VW187 (O7:K1). C. T. MAROUDA and M. A. VALVANO\* Dept. of Microbiol. and Immunology, Univ. of Western Ontario, London, Ontario, Canada.
- B285.** Cloning, Sequencing, and Initial Characterization of *Pasteurella haemolytica* A1 Lipopolysaccharide Biosynthetic Genes. M. D. BELL\* and R. Y. C. LO. Dept. of Microbiol., Univ. of Guelph, Guelph, Ontario, Canada.
- B286.** Nucleotide Sequence of the *rfb* Region of *Yersinia enterocolitica* O:3. T. ZHANG, P. TOIVANEN, and M. SKURNIK\* Turku Univ., Turku, Finland.
- B287.** Affinity Method for the Purification of Polyclonal Antibody to *Chlamydia trachomatis* Lipopolysaccharide. B. ELLIS,\* D. MARTIN, C. O. YEHLE, and J. E. GHI. Boehringer Mannheim Corp., Indianapolis, Ind.

### Session 258 (J)

## MORPHOLOGY AND CELL SURFACES II

Saturday, 8:30 A.M., Room 44

**Moderators:** T. J. BEVERIDGE, Univ. of Guelph, Guelph, Ontario, Canada, and R. E. W. HANCOCK, Univ. of British Columbia, Vancouver, British Columbia, Canada

8:30

- J8.** Morphological Examination of Lipopolysaccharide of *Pseudomonas aeruginosa* Strains and Their Isogenic Lipopolysaccharide-Deficient Mutants by Freeze-Substitution. L. I. GRAHAM,\* T. DASGUPTA, J. LIGHTFOOT, T. J. BEVERIDGE, and J. S. LAM. Dept. of Microbiol., Univ. of Guelph, Guelph, Ontario, Canada.
- J9.** Evidence that the Membrane-Induced Proton Motive Force in *Bacillus subtilis* 168 Affects Electronegative Sites within the Wall. M. URRUTIA,\* T. BEVERIDGE, M. KEMPER, and R. DOYLE. Dept. of Microbiol., Univ. of Guelph, Guelph, Ontario, Canada, and Immunology, Univ. of Louisville, Louisville, Ky.
- J10.** Inclusion Body Formation by Vegetative Cells of *Clostridium perfringens* at Elevated Temperatures. J. S. GARCIA-ALVARADO,\* M. A. RODRIGUEZ, and R. G. LABBE. Univ. A. Nuevo León, San Nicolás, N.L., Mexico, and Univ. of Massachusetts, Amherst.
- J11.** Localized Membrane Differentiation Associated with Division in *Caulobacter crescentus*. T. LANE\* and A. NEWTON. Dept. of Molecular Biol., Princeton Univ., Princeton, N.J.

9:30

- J12.** Ultrastructure of the Periplasmic Flagella of *Leptospira interrogans*. G. A. TRUEBA,\* C. A. BOLIN, and R. T. ZUERNER. Iowa State Univ. and Nat. Animal Disease Ctr., Ames.
- J13.** Characterization of F-Pilin as an Inner Membrane Component of *Escherichia coli* K-12. W. PAIVA,\* T. GROSSMAN, and P. SILVERMAN. Univ. of Oklahoma, Norman, Oklahoma, and P. SILVERMAN, Oklahoma Med. Res. Fdn., Oklahoma City, and Albert Einstein Col. of Med., Bronx, N.Y.

- J14.** Analysis of Two- and Three-Dimensional Crystals of Porin OprP from *Pseudomonas aeruginosa*. C. EGLI,\* N. L. MARTIN, G. D. BRAYER, B. K. JAP, and R. E. W. HANCOCK. Dept. of Microbiol. and Dept. of Biochemistry, Univ. of British Columbia, Vancouver, British Columbia, Canada, and Donner Lab., Lawrence Berkeley Lab., Univ. of California, Berkeley.
- J15.** Initiation of LamB Trimerization Occurs in the Inner Membrane of *Escherichia coli*. S. JUSTICE\* and J. STADER. Sch. of Basic Life Sci., Univ. of Missouri, Kansas City.

10:30

- J16.** Genetic and Biochemical Characterization of the LamB Signal Sequence Mutations. S.-Q. WEI\* and J. STADER. Sch. of Basic Life Sci., Univ. of Missouri, Kansas City.
- J17.** Effects of an 8-Aminoquinoline, WR6026, on the Ultrastructural Integrity of *Pneumocystis carinii*. M. GOHEEN,\* M. BARTLETT, M. SHAW, S. QUEENER, and J. SMITH. Indiana Univ. Sch. of Med., Indianapolis.

**Session 259 (R). Seminar**  
(Eligible for continuing education credit)

**REPRODUCIBLE BIOLOGICAL MATERIALS:  
WHY YOU NEED THEM AND WHERE TO  
GET THEM**

Saturday, 8:30 A.M., Room 37

*Convenors:* RICHARD ROBLIN, American Type Culture Collection, Rockville, Md., and NICHOLAS GILLHAM, Duke Univ., Durham, N.C.

Genetic Stock Centers

NICHOLAS GILLHAM, Duke Univ., Durham, N.C.

Mammalian Cell Culture Collections

RICHARD MULLIVORE, Coriell Inst., Camden, N.J.

General Service Collections

RICHARD ROBLIN, American Type Culture Collection, Rockville, Md.

Clinical Materials

JOSEPH MCDADE, CDC, Atlanta, Ga.

Organ and Tissue Sources

LEE DUCAT, Nat. Disease Res. Interchange, Philadelphia, Pa.

**Session 260 (H). Seminar**  
(Eligible for continuing education credit)

**SURVIVING HARD TIMES: GROWING  
INTEREST IN NONGROWING CELLS**

Saturday, 8:30 A.M., Room 39

*Convenors:* ROBERTO KOLTER, Harvard Med. Sch., Boston, Mass., and STAFFAN KJELLEBERG, Univ. of Goteborg, Goteborg, Sweden

The Physiology of Starvation and Recovery of *Vibrio*  
STAFFAN KJELLEBERG, Univ. of Goteborg, Goteborg, Sweden

The Starvation-Induced Resistant State of *Escherichia coli*  
ABDUL MATIN, Stanford Univ., Stanford, Calif.

The Role of *rpoS* in Stationary-Phase *Escherichia coli* Cells  
REGINE HENGGE-ARONIS, Univ. of Konstanz, Konstanz, Germany

The Killer Phenotype of Aged *Escherichia coli* Cultures  
ROBERTO KOLTER, Harvard Med. Sch., Boston, Mass.

An Overview of Selection-Induced Mutations  
BARRY HALL, Univ. of Rochester, Rochester, N.Y.

**Session 261 (K). Seminar**  
(Eligible for continuing education credit)

**MOLECULAR BIOLOGY AND BIOCHEMISTRY  
OF BACTERIAL CARBOHYDRATE  
TRANSPORTERS**

Saturday, 8:30 A.M., Room 41

*Convenors:* GARY JACOBSON, Boston Univ., Boston, Mass., and ROBERT BROOKER, Univ. of Minnesota, St. Paul

Molecular Biology of the Lactose Permease of *Escherichia coli*  
ROBERT BROOKER, Univ. of Minnesota, St. Paul

Structure and Function of the Melibiose Carrier of *Escherichia coli*  
T. HASTINGS WILSON, Harvard Med. Sch., Boston, Mass.

The *Escherichia coli* Mannitol Permease: Structure and Mechanism  
GARY JACOBSON, Boston Univ., Boston, Mass.

Molecular Biology of the Chimeric Galactoside Transport Protein of *Streptococcus thermophilus*  
BERT POOLMAN, Univ. of Groningen, Groningen, The Netherlands

Protein Interactions during Maltose Active Transport  
HOWARD SHUMAN, Columbia Univ., New York, N.Y.

Regulation and Function of the *Escherichia coli* Sugar Phosphate Transporter, UhpT  
ROBERT KADNER, Univ. of Virginia, Charlottesville

**Session 262 (BET). Round Table**  
(Eligible for continuing education credit)

**AGAROSE GEL ELECTROPHORESIS OF DNA  
FOR THE TEACHING LABORATORY**

Saturday, 8:30 A.M., Room 42

*Convenors:* PETER ABRAMOFF, Marquette Univ., Milwaukee, Wis., and ROBERT DUNST, Fotodyne Inc., New Berlin, Wis.

SATURDAY

Recombinant DNA technology is a subject covered in every modern microbiology textbook and in an increasing number of laboratory manuals. This session will seek to provide faculty who have little or no direct experience in the basic principles of DNA and gene manipulation with a basic understanding of the techniques that are now commonly used in so many areas of molecular and cellular biology. The presentations and demonstrations will be constructed so that the experiments may be easily introduced into courses.

Topics which will be covered include: preparation of agarose gels; gel electrophoresis, staining, and photography; and nucleic acid sample preparation and manipulation with endonucleases.

*Participants:* PETER ABRAMOFF, ROBERT DUNST, and BRIAN WALSH

### Session 263 (BET). Seminar

(Eligible for continuing education credit)

## NEW DIRECTIONS IN UNDERGRADUATE EDUCATION

Saturday, 8:30 A.M., Room 13

*Convenors:* JEFFREY J. SICH, NIH, Bethesda, Md., and SHARON ZABLOTNEY, Mankato State Univ., Mankato, Minn.

Developing a National Life Science Literacy Program  
SHARON ZABLOTNEY, Mankato State Univ., Mankato, Minn.

Results from the Undergraduate Faculty Enhancement Program: an Innovative Approach to Improving Undergraduate Education  
AMY CHANG, American Society for Microbiol., Washington, D.C.

Project Kaleidoscope: a Plan for Strengthening Undergraduate Science and Mathematics  
PEGGY REDSHAW, Austin Col., Sherman, Tex.

Education Pathways in the Sciences for Minorities  
Sr. GRACE MARY FLICKINGER, Xavier Univ. of Louisiana, New Orleans

### Session 264 (E). Seminar

(Eligible for continuing education credit)

## NEW DEVELOPMENTS IN BACTERIAL AND PARASITE VACCINES

Saturday, 8:30 A.M., Room 21

*Convenors:* DAVID E. BRILES, Univ. of Alabama, Birmingham, and MICHAEL APICELLA, SUNY at Buffalo, Buffalo, N.Y.

The Potential for Protein Vaccines against *Streptococcus pneumoniae*  
DAVID E. BRILES, Univ. of Alabama, Birmingham

Prevention of Nontypeable *Haemophilus influenzae* Infection  
MICHAEL APICELLA, SUNY at Buffalo, Buffalo, N.Y.

Mucosal and Systemic Immunization Using Microencapsulated Vaccines

JOHN H. ELDRIDGE, Univ. of Alabama, Birmingham

Progress toward Development of a Vaccine for Schistosomiasis  
PHILIP T. LOVERDE, SUNY at Buffalo, Buffalo, N.Y.

Recent Progress in Development of Vaccines for *Pseudomonas aeruginosa* Infections

GERALD B. PIER, Harvard Med. Sch., Boston, Mass.

## Session 265 (S)

## DETECTION OF VIRAL NUCLEIC ACIDS AND ANTIGENS

Saturday, 8:30 A.M., Room 27

*Moderators:* GLENN A. GENTRY, Univ. of Mississippi, Jackson, and H. H. BALFOUR, Univ. of Minnesota Health Sci. Ctr., Minneapolis

8:30

S45. Paradox in the Pathogenesis of Infection with Minute Virus of Mice (MVM): Parity of Infectious Virus Titers in Susceptible and Resistant Strains of Mice despite Disparities in the Amount of Total MVM DNA. S. KAPIL\* and D. G. BROWNSTEIN. Yale Sch. of Med., New Haven, Conn.

S46. A Probe for In Situ Detection of Lytic Epstein-Barr Virus Infection in Fixed Clinical Specimens. J. RYON, Y. LING,\* T. C. WU, J. ZHANG, S. D. HAYWARD, P. CHARACHE, R. MANN, E. M. E. MACMAHON, and R. AMBINDER. Johns Hopkins Med. Inst., Baltimore, Md.

S47. Study of the Integrated Epstein-Barr Virus Fragments in the Nasopharyngeal Carcinoma Cell Line CG1. Y. S. TYAN,\* L. Y. LEE, Y. S. CHANG, and S. T. LIU. Nat. Defence Med. Ctr. and Chang-Gung Med. Col., Taipei, Taiwan, Republic of China.

S48. Purification of an Arabinosylthymine-Sensitive Deoxythymidine Kinase from an Epstein-Barr Genome-Positive Burkitt's Lymphoma Cell Line. R. H. HOLTON,\* H. S. ALLAU-DEEN, and G. A. GENTRY. Dept. of Microbiol., Univ. of Mississippi Med. Ctr., Jackson.

9:30

S49. Rapid Herpes Simplex Virus Susceptibility Testing Using the Du Pont Herpcheck Enzyme Immunoassay. C. ISADA,\* M. PROFFITT, M. BAHN, B. YEN-LIEBERMAN, and M. C. MCHENRY. Cleveland Clin. Fndn., Cleveland, Ohio.

S50. Comparison of the HPV OmniProbe In Situ Hybridization Cocktail versus Southern Blot Hybridization for the Detection of Human Papillomavirus DNA. A. LORINCZ,\* W. CHAPMAN, and R. KURMAN. Digene Diagnostics, Inc., Silver Spring, Md.; Georgetown Univ., Washington, D.C.; and Johns Hopkins Univ., Baltimore, Md.

S51. Use of Branched DNA Multimers for Direct Detection of Human Hepatitis Viruses in Serum or Plasma. T. J. FULTZ,\* S. J. HAMREN, T. HORN, C.-A. CHANG, D. AHLE, and M. S. URDEA. Chiron Corp., Emeryville, Calif.

S52. Hepatitis C Viral Genotypes. T.-A. CHA,\* E. BEALL, B. IRVINE, C. CHAN, and J. KOLBERG. Chiron Corp., Emeryville, Calif.

10:30

- S53.** Detection of Hepatitis C Virus RNA in Human Sera by a Quantitative Branched DNA Amplification Assay. P. SHERIDAN, J. DETMER, W. HUNT, C. CHAN, T. WRIGHT, J. WILBER, P. NEUWALD, M. S. URDEA, and R. SANCHEZ-PESCADOR.\* Chiron Corp., Emeryville, Calif., and Univ. of California-San Francisco Med. Ctr., San Francisco.
- S54.** Quantitative Method for Detection of Human Cytomegalovirus DNA Using a Branched-DNA-Enhanced Label Amplification Assay. L. P. SHEN,\* J. A. KOLBERG, R. R. SPAETE, R. MINER, and W. L. DREW. Chiron Corp., Emeryville, Calif., and Mount Zion Hosp. and Med. Ctr. of Univ. of California, San Francisco.
- S55.** Detection of Cytomegalovirus (CMV) Antigen in Polymorphonuclear Blood Leukocytes Is More Sensitive than Shell-Vial Cultures for the Diagnosis of CMV Viremia. M. A. HOLM,\* A. ERICE, P. C. GILL, S. HENRY, R. P. HILLAM, D. L. DUNN, and H. H. BALFOUR, JR. Univ. of Minnesota Health Sci. Ctr., Minneapolis, and INCSTAR Co., Stillwater, Minn.

**Session 266 (U). Seminar**

*(Eligible for continuing education credit)*

**ACQUIRED IMMUNITY TO  
MYCOBACTERIAL INFECTIONS**

Saturday, 8:30 A.M., Room 16

*Convenors:* IAN ORME, Colorado Univ., Fort Collins, and PETER BARNES, USC Sch. of Med., Los Angeles, Calif.

Monokine Production in Human Tuberculosis  
PETER BARNES, USC Sch. of Med., Los Angeles, Calif.

The T-Cell Response in Human Tuberculosis  
HENRY BOOM, Case Western Univ. Sch. of Med., Cleveland, Ohio

Cytokine Responses in Mice Infected with Tuberculosis  
IAN ORME, Colorado State Univ., Fort Collins

Cell-Mediated Immunity in Leprosy  
GILLA KAPLAN, Rockefeller Univ., New York, N.Y.

Immunodominant Antigens Secreted by *Mycobacterium tuberculosis*  
PETER ANDERSEN, Statens Seruminstitut, Copenhagen, Denmark

**Session 267 (Q). Seminar**

*(Eligible for continuing education credit)*

**NUCLEIC ACIDS IN THE ENVIRONMENT**

Saturday, 8:30 A.M., Room 36

*Convenors:* JOHN H. PAUL, Univ. of South Florida, St. Petersburg, and MICHAEL GEALT, Drexel Univ., Philadelphia, Pa.

Detection of Novel Archaea in the Marine Environment Using Polymerase Chain Reaction Amplification and Small Subunit rRNA Probes

ED DI LONG, Woods Hole Oceanographic Inst., Woods Hole, Mass.

Detection and Characterization of Nitrogen Fixation Genes in the Marine Environment

JONATHAN P. ZEHR, SUNY at Stony Brook, Stony Brook, N.Y.

Nucleic Acids in the Marine Environment: mRNA and Dissolved DNA

JOHN H. PAUL, Univ. of South Florida, St. Petersburg

Adsorption of DNA to Natural Soils and Sediments

ANDREW OGRAM, Washington State Univ., Pullman

Isolation of Bacterial Community DNA from the Soil Environment: Methods and Applications

WILLIAM HOLBEN, Michigan State Univ., E. Lansing

The Presence and Survival of DNA in Wastewater

MICHAEL GEALT, Drexel Univ., Philadelphia, Pa.

**Session 268 (O). Seminar**

*(Eligible for continuing education credit)*

**SCALEUP: INTERFACE BETWEEN  
MICROBIOLOGISTS AND BIOCHEMICAL  
ENGINEERS**

Saturday, 8:30 A.M., Room 1

*Convenors:* ANIL MENAWAT, Tulane Univ., New Orleans, La., and RICHARD WAX, Pfizer, Inc., Groton, Conn.

Problems in Scaleup of Biotechnology Production Processes  
HAROLD REISMAN, Organogenesis, Inc., Cambridge, Mass.

Biochemical Engineering Challenges Presented by Mycelial Microorganisms  
KEVIN MURPHY, Pfizer Inc., Groton, Conn.

Safety Practices in a Human Immunodeficiency Virus Production Facility  
MICHAEL MOORE, Amoco Technology Co., Naperville, Ill.

Communication between Engineers and Microbiologists during Scaleup  
NIKHIL MEHTA, Hoffmann-La Roche, Inc., Nutley, N.J.

An Academic Perspective to Current State of Secondary Metabolism Research  
ANIL S. MENAWAT, Tulane Univ., New Orleans, La.

SATURDAY



**Session 269 (G). Seminar**  
(Eligible for continuing education credit)

**PLANT AND INSECT MOLLICUTES**

Saturday, 8:30 A.M., Room 19

*Convenors:* BARBARA B. SEARS, Michigan State Univ., E. Lansing, and ROBERT F. WHITCOMB, USDA, Agricultural Res. Service, Beltsville, Md.

Insects and Mollicutes: a Long-Standing Association  
ROBERT F. WHITCOMB, USDA, Agricultural Res. Service, Beltsville, Md.

Evolution of Prokaryote-Insect Vector Relationships  
ALEXANDER H. PURCELL, Univ. of California, Berkeley

*Spiroplasma citri*: Genes and Genome  
JOSEPH M. BOVE, INRA, Ctr. de Recherches de Bordeaux, Villenave D'Ornon Cedex, France

Molecular Detection of the Elusive Coconut Lethal Yellowing Disease Agent  
NIGEL HARRISON, Univ. of Florida, Fort Lauderdale

Unveiling the Evolutionary History of Plant-Pathogenic Mycoplasma-like Organisms  
BARBARA B. SEARS, Michigan State Univ., E. Lansing

**Session 270 (P). Seminar**  
(Eligible for continuing education credit)

**ADVANCES IN PRESERVATION SYSTEMS FOR FOODS**

Saturday, 8:30 A.M., Room 33

*Convenors:* JOHN B. LUCHANSKY and ERIC A. JOHNSON, Food Res. Inst., Madison, Wis.

Industrial Overview on Preservatives, Processing, and Packaging  
GEORGE M. EVANCHO, Campbell Soup Co., Campbell Inst. for Res. and Technology, Camden, N.J.

Traditional Methods in Microbial Food Preservation: an Update  
JOHN N. SOFOS, Colorado State Univ., Fort Collins

Naturally Occurring Antimicrobial Agents for Control of Food-Borne Pathogens  
ERIC A. JOHNSON, Food Res. Inst., Madison, Wis.

Use of Lactic Acid Bacteria To Inhibit Undesirable Microorganisms in Foods  
JOHN B. LUCHANSKY, Food Res. Inst., Madison, Wis.

Advances in Packaging for Food Preservation  
CHARLES BARMORE and KARIN OVERBY, Cryovac Div., W. R. Grace & Co., Duncan, S.C.

FDA Perspective on Safety of New-Generation Foods  
JEFFERY E. RHODEHAMEL, FDA, Washington, D.C.

**Session 271 (M)**

**INTERACTIONS OF HOST AND PHAGE ELEMENTS IN GENE EXPRESSION**

Saturday, 8:30 A.M., Room 38

*Moderators:* G. E. CHRISTIE, Virginia Commonwealth Univ., Richmond, and D. FRIEDMAN, Univ. of Michigan, Ann Arbor

8:30

**M1.** Sequence and Function Analysis of Regions of T4 Involved in the Transition from Host to Phage Metabolism following Infection. E. KUTTER,\* T. WHITE, T. DJAVACHISHVILI, J. EIDEMILLER, W. CANADA, M. AWAYA, D. HARPER, and B. GUTTMAN. Evergreen State Col., Olympia, Wash., and Inst. of Molecular Biol. and Biophysics, Tbilisi, Georgia.

**M2.** Characterization of an *Escherichia coli* Strain (TabRegA) That Restricts Growth of Bacteriophage T4 *regA* Mutants. G. C. SHIH\* and E. S. MILLER. Dept. of Microbiol., North Carolina State Univ., Raleigh.

**M3.** Characterization of *rpoA* Mutants Affecting P2 Late Gene Expression. D. AYERS\* and G. E. CHRISTIE. Virginia Commonwealth Univ., Richmond.

**M4.** A Deletion Caused by the Excision of a Cryptic Prophage in *Escherichia coli* Inhibits the Growth of  $\lambda$  immP22. D. RETALLACK,\* L. JOHNSON, and D. FRIEDMAN. Univ. of Michigan, Ann Arbor.

9:30

**M5.** Promoter Influences on Transcription Antitermination in Bacteriophage  $\lambda$ . K. HENTHORN,\* E. OLSON, D. THOMPSON, and D. FRIEDMAN. Univ. of Michigan and Parke-Davis, Ann Arbor.

**M6.** Characterization of the Transcription Termination Signals in the *nin* Region of Bacteriophage  $\lambda$ . S.-W. C. CHENG\* and D. I. FRIEDMAN. Univ. of Michigan, Ann Arbor.

**POSTER SESSIONS**

Saturday, 9:00-10:30 A.M., Exhibit Hall C

(Board numbers in parentheses)

**Session 272 (Q). BIOTRANSFORMATION AND BIODEGRADATION IV**

**Q296.** Screening of Microbes from Deep-Subsurface Environments for the Ability To Degrade Nonvolatile Organic Contaminants. (001) B. D. LEE,\* R. M. LEHMAN, and F. S. COLWELL. Idaho Nat. Engineering Lab., Idaho Falls.

**Q297.** Impact of Atrazine on Microbial Growth and Decomposition. (003) W. E. EVANS,\* C. E. WARNES, and D. A. HENDRICKSON. Dept. of Biol., Ball State Univ., Muncie, Ind.

**Q298.** Characterization of a Chitosanase from *Kitasatospora* N174 and Studies on Expression of Its Cloned Gene in *Escherichia coli*. (005) I. BOUCHER,\* J.-Y. MASSON, and R. BRZEZINSKI. Univ. de Sherbrooke, Sherbrooke, Quebec, Canada.

- Q299.** Biodegradation of Oxydisuccinate in Subsurface Soils from a Septic Tank Tile System. (007) N. R. ITRICH, C. E. WHITE, D. C. MCAVOY, and T. W. FEDERLE.\* Procter & Gamble Co., Cincinnati, Ohio.
- Q300.** Growth and Utilization of D-12-Hydroxystearic Acid by Gram-Negative Bacteria. (009) K. KEUDELL,\* J. ZHAO, W. KLOPFENSTEIN, and J.-K. HUANG. Western Illinois Univ., Macomb.
- Q301.** Replacement of Ancillary Electron Transport Protein Components of Cytochrome P-450<sub>o</sub> System of *Streptomyces griseus* with Artificial Electron Donors. (011) M. RAMACHANDRA, S. SARIASLANI,\* and M. EMPTAGE. Central Res. & Dev., DuPont Co., Exp. Station, Wilmington, Del.
- Q302.** Identification of a Phytase from *Citrobacter freundii*. (013) A. J. DELUCCA,\* C. DISCHINGER, and A. H. J. ULLAH. USDA, Agricultural Res. Service, Southern Regional Res. Ctr., New Orleans, La.
- Q303.** Biodegradation of Poly( $\beta$ -Hydroxyalkanoates) under Aerobic and Anaerobic Conditions. (015) M. L. DIGLIO, S. SULLIVAN, and S. GOODWIN.\* Univ. of Massachusetts, Amherst.
- Q304.** Biodegradability of Blends of Poly(beta-hydroxybutyrate-cohydroxyvalerate) with Ester-Substituted Celluloses. (017) D. F. GILMORE,\* N. LOTTI, R. W. LENZ, M. SCANDOLA, and R. C. FULLER. Dept. of Biochemistry and Molecular Biol. and Dept. of Polymer Sci. and Engineering, Univ. of Massachusetts, Amherst, and "G. Ciamician" Dept. of Chemistry, Univ. of Bologna, Bologna, Italy.
- Q305.** Methanogenic Degradation of Poly(beta-hydroxyalkanoates). (019) K. BUDWILL,\* P. M. FEDORAK, and W. J. PAGE. Univ. of Alberta, Edmonton, Alberta, Canada.
- Q306.** Esterase Activity of *Acinetobacter calcoaceticus* and the Pathway of Bis(2-Ethylhexyl) Adipate Degradation. (021) A. YABANAVAR. Rutgers Univ., New Brunswick, N.J.
- Q307.** Microtox Assay for Degradable Plastics. (023) K. E. JOHNSON,\* A. L. POMETTO III, L. SOMASUNDARAM, and J. COATS. Iowa State Univ., Ames.
- Q308.** Beta-Glucosidase-I of *Microbispora bispora*: the Enzyme and Its Gene. (025) A. K. GOYAL,\* R. M. WRIGHT, and D. E. EVELEIGH. Rutgers Univ., New Brunswick, N.J.
- Q309.** Cellulolytic Bacteria of Host-Associated and Free-Living Origin. (027) S. WAGENER,\* T. C. SWEENEY, and J. A. BREZNAK. Dept. of Microbiol. and Ctr. for Microbial Ecology, Michigan State Univ., East Lansing.
- Q310.** Production, Characterization, and Application of Monoclonal Antibodies to *Clostridium aldricum*. (029) R. L. BRIGMON,\* J. C. YANG, S. G. ZAM, and D. P. CHYNOWETH. Univ. of Florida, Gainesville.
- Q311.** Effect of Acid Orange Seven on the Microbial Biofilm of a Rotating Bioreactor. (031) K. B. HAWS,\* C. HARMER, J. R. VESTAL, and P. BISHOP. Univ. of Cincinnati, Cincinnati, Ohio.
- Q312.** Conversion of Sodium Cyanide to Carbon Dioxide and Ammonia by Immobilized Cells of *Pseudomonas putida*. (033) G. R. V. BABU, J. H. WOLFRAM,\* and K. D. CHAPATWALA. Div. of Natural Sci., Selma Univ., Selma, Ala., and Biotechnology, INEL, EG&G Idaho, Inc., Idaho Falls.
- Q313.** Structure and Organization of Biofilm from an Anaerobic Fixed-Film Reactor. (035) C. F. KULPA,\* B. SCHOEDEL, K. M. HSIEH, and H. T. CHANG. Univ. of Notre Dame, Notre Dame, Ind., and Amoco Chemical Co., Naperville, Ill.
- Q314.** Microbial Biomass Levels in Fluidized Bed Reactors at High Chemical Loadings. (037) D. E. EDWARDS\* and M. A. HEITKAMP. Environmental Sci. Ctr., Monsanto Co., St. Louis, Mo.
- Q315.** Biodegradation of N-Phosphonomethyliminodiacetic Acid, a Key Component of Glyphosate Process Waste. (039) D. B. CARSON,\* L. E. HALLAS, and M. A. HEITKAMP.

Agricultural Technology and Environmental Sci. Ctr., Monsanto Co., St. Louis, Mo.

- Q316.** Degradation of Acrylamide by Immobilized Cells of *Pseudomonas* sp. and *Xanthomonas maltophilia*. (041) M. S. NAWAZ,\* W. FRANKLIN, and C. E. CERNIGLIA. Nat. Ctr. for Toxicological Res., FDA, Jefferson, Ark.

## Session 273 (H). DNA REARRANGEMENTS: TRANSPOSITION AND INVERSION

- H260.** Transformation of *Neisseria gonorrhoeae* with DNA Harboring a Mini-Transposon To Produce a Genomic P<sub>hly</sub>/ $\beta$ -Galactosidase Transcriptional Fusion. (043) S. BOYLE-VAVRA,\* K. HOIKKA, and H. S. SEIFERT. Northwestern Univ. Med. Sch., Chicago, Ill.
- H261.** The Transposition/Excision Factor for the Insertion Sequence IS2 Is Expressed by Translational Frameshifting. (045) R. MUSSO\* and T. HODAM. Univ. of South Carolina, Columbia.
- H262.** IS2 Transposes in the Same Orientation into the 5' Regions of the Structural Gene and the Promoter of *hemB* in *Escherichia coli* K-12 and Excises from These Sites with Different Frequencies. (047) L. A. LEWIS,\* N. PACHECO, and D. LEWIS. York Col. of City Univ. of New York, Jamaica, N.Y.
- H263.** Role of IS1 in Regulation of Virulence Antigen Expression in *Enterobacteriaceae*. (049) J. T. OU,\* C.-J. HUANG, H. H. HOUNG, and L. S. BARON. Chang Gung Med. Col., Taoyuan, Taiwan, and Walter Reed Army Inst. of Res., Washington, D.C.
- H264.** Regional Specificity of  $\gamma\delta$  and Mini- $\gamma\delta$  Transposition. (051) X. XU,\* G. WANG, and C. M. BERG. Univ. of Connecticut, Storrs.
- H265.** Restriction Mapping of a Tn4560 Insertion Fragment from a *Streptomyces tendae* Nik Strain Indicates Loss of Tn4560 Restriction Sites. (053) M. S. WRIGHT\* and P. ENGEL. Southern Regional Res. Ctr., USDA, Agricultural Res. Service, New Orleans, La.
- H266.** A Retrotransposonlike Element in *Candida albicans*. (055) J.-Y. CHEN\* and W. A. FONZI. Univ. of California, Irvine.
- H267.** Characterization of the Novel Genetic Element  $\Psi$ Tn554 in Methicillin-Resistant *Staphylococcus aureus*. (057) S. G. CHIKRAMANE\* and D. T. DUBIN. Univ. of Med. and Dent. of New Jersey-R.W. Johnson Med. Sch., Piscataway.
- H268.** Tn4351-Mediated Mutagenesis of *Porphyromonas (Bacteroides) gingivalis*. (059) M. O. LASSITER\* and C. A. GENCO. Morehouse Sch. of Med., Atlanta, Ga.
- H269.** Roles of *fimB* and *fimE* in Recombination of the *fim* Invertible Element in *Escherichia coli*. (061) M. S. MCCLAIN,\* I. C. BLOMFIELD, P. J. CALIE, K. J. EBERHARDT, and B. I. EISENSTEIN. Dept. of Microbiol. and Immunology, Univ. of Michigan Med. Sch., Ann Arbor.
- H270.** Influence of Protein MBF (Methylation Blocking Factor) on Type 1 Fimbrial Phase Variation. (063) I. C. BLOMFIELD,\* P. J. CALIE, K. EBERHARDT, and B. I. EISENSTEIN. Dept. of Microbiol. and Immunology, Univ. of Michigan Med. Sch., Ann Arbor.
- H271.** Characterization of *Salmonella typhimurium* *fix* Mutants. (065) A. LIENAU\* and K. HUGHES. Univ. of Washington, Seattle.

## Session 274 (K). POLYMER DEGRADATION AND HYDROLYTIC ENZYMES

- K151.** Detection of Catabolite Repression by Cellulolytic Bacteria Using a Glucose Analog. (067) K. L. ANDERSON\* and V. H. VAREL. USDA, Agricultural Res. Service, U.S. Meat Animal Res. Ctr., Clay Center, Nebr.
- K152.** Cloning and Partial Characterization of a Cellulase Gene from the Rumen Anaerobe *Ruminococcus albus*. (069) G. T. ATTWOOD,\* N. J. DAVIES, F. HERRERAS, and B. A. WHITE. Univ. of Illinois, Urbana.
- K153.** Analysis of the Cellulose-Binding Domains of the Cellulose-Binding Protein from *Clostridium cellulovorans*. (071) M. A. GOLDSTEIN,\* M. TAKAGI, and R. H. DOI. Dept. of Biochemistry and Biophysics, Univ. of California, Davis.
- K154.** Primary Sequence Analysis of *Clostridium cellulovorans* Cellulose Binding Protein A. (073) M. TAKAGI,\* M. A. GOLDSTEIN, O. SHOSEYOV, and R. H. DOI. Dept. of Biochemistry and Biophysics, Univ. of California, Davis.
- K155.** Regulation of the Synthesis and Properties of the Xylanase of *Bacteroides xylanolyticus* X5-1. (075) P. J. Y. M. J. SCHYNS\* and A. J. M. STAMS. Dept. of Microbiol., Agricultural Univ. Wageningen, The Netherlands.
- K156.** Interspecies Hydrogen Transfer Compared with Use of an External Electron Acceptor (Acetol) as a Tool To Study the Influence of Molecular Hydrogen on *Bacteroides xylanolyticus* x5-1 Xylose Metabolism. (077) S. BIESTERVELD\* and A. J. M. STAMS. Dept. of Microbiol., Agricultural Univ. Wageningen, Wageningen, The Netherlands.
- K157.** Degradation and Utilization of Xylan by the Ruminant Bacteria *Butyrivibrio fibrisolvens* and *Selenomonas ruminantium*. (079) M. A. COTTA. USDA, Agricultural Res. Service, Nat. Ctr. for Agricultural Utilization Res., Peoria, Ill.
- K158.** Characterization of the Xylan Degradative System of *Bacteroides ovatus*. (081) T. R. WHITEHEAD,\* P. J. VALENTINE, M. A. COTTA, and A. A. SALYERS. USDA, Agricultural Res. Service, Nat. Ctr. for Agricultural Utilization Res., Peoria, Ill., and Dept. of Microbiol., Univ. of Illinois, Urbana.
- K159.** Characterization of Endoglucanases/Xylanases from *Clostridium cellulovorans* by Substrate Specificity, Domain Analysis, and Their Presence on the Cellulose Complex. (083) F. FOONG,\* T. HAMAMOTO, and R. H. DOI. Dept. of Biochemistry/Biophysics, Univ. of California, Davis.
- K160.** Outer Membrane-Associated Fibrolytic Enzymes of *Fibrobacter succinogenes* S85. (085) J. GONG\* and C. W. FORSBERG. Univ. of Guelph, Guelph, Ontario, Canada.
- K161.** The Family of Glucanase Genes from *Fibrobacter succinogenes* S85. (087) L. M. MALBURG, JR., and C. W. FORSBERG. Univ. of Guelph, Guelph, Ontario, Canada.
- K162.** Comparative Studies of Endoglucanase Activity and Secretion among *Fibrobacter* Isolates. (089) C. LIN\* and D. STAHL. Univ. of Illinois, Urbana.
- K163.** Induction by Cyclodextrins of an Additional Extracellular Amylolytic Enzyme in *Lactobacillus amylovorus*. (091) A. BURGESS-CASSLER. USDA, Agricultural Res. Service, Biopolymer Res. Unit, Nat. Ctr. for Agricultural Utilization Res., Peoria, Ill.
- K164.** Glucose and Galactose Metabolism in *Azobacter vinelandii*. (093) L. SHERIDAN,\* S. CRAIG, and T. Y. WONG. Memphis State Univ., Memphis, Tenn.
- K165.** Cloning and Sequencing Analysis of the pH6 Acetolactate Synthase Gene of *Klebsiella pneumoniae*. (095) H.-Y. CHANG\* and H.-L. PENG. Dept. of Molecular Biol., Chang-Gung Med. Col., Kwei-San, Taiwan.
- K166.** Utilization of Aromatic Acrylate Groups by Acetogenic Bacteria under CO<sub>2</sub>-Limited Conditions. (097) M. F. LUX,\*

M. PAREKH, E. S. KEITH, S. L. DANIEL, J. M. AKAGI, and H. L. DRAKE. Univ. of Southern Mississippi, Hattiesburg; Univ. of Mississippi, University; and Univ. Bayreuth, Bayreuth, Germany.

- K167.** Degradation of Starch/Polyethylene Degradable Plastic Bags in Compost Environments. (099) K. E. JOHNSON,\* A. L. POMETTO III, Z. L. NIKOLOV, and B. LEE. Iowa State Univ., Ames.
- K168.** Pure Culture Assay for Evaluating the Biodegradability of Degradable Plastics. (101) A. L. POMETTO III\* and K. E. JOHNSON. Iowa State Univ., Ames.

## Session 275 (C). EPIDEMIOLOGY OF BACTERIAL AND VIRAL AGENTS I

- C294.** Comparative Evaluation of Epidemiologic Typing Methods for Clinical Strains of *Acinetobacter*. (103) E. A. MACIAS,\* A. R. WANGER, and M. T. LAROCCO. Univ. of Texas Med. Sch., Houston.
- C295.** A 3-Year Retrospective Study of Clinical *Aeromonas* Isolates Using Aerokey II. (105) A. CARNAHAN,\* D. WATSKY, and R. PEELER. Anne Arundel Med. Ctr., Annapolis, Md.
- C296.** Esterase Isoenzyme Typing of Two Recently Proposed Species of *Aeromonas* with Possible Application as a Fingerprinting Technique for Epidemiological Studies. (107) P. A. MACALUSO\* and S. W. JOSEPH. Univ. of Maryland, College Park.
- C297.** Lyme Disease Surveillance in Several TVA Public-Use Areas on Kentucky Lake. (109) Z. WANG,\* J. STUART, L. DUOBINIS-GRAY, and S. WHITE. Dept. of Biol. Sci., Murray State Univ., Murray, Ky.
- C298.** Isolation of *Borrelia burgdorferi* from Feral House Mice Captured in Virginia. (111) R. E. RATZLAFF,\* J. TROYER, E. DEMERLEE, S. DEMERLEE, and D. E. SONENSHINE. Old Dominion Univ., Norfolk, Va.
- C299.** Cluster of Nontoxicogenic *Corynebacterium diphtheriae* Infections among Swiss Intravenous-Drug Abusers. (113) E. GRÜNER,\* G. MARTINETTI, A. VON GRAEVENITZ, and M. ALTWEGG. Dept. of Med. Microbiol., Univ. of Zurich, Zurich, Switzerland.
- C300.** Increased Risk of Conjunctivitis Caused by the Brazilian Purpuric Fever (BPF) Clone among Children Exposed to BPF Cases in Mato Grosso State, Brazil. (115) M. L. C. TONDEL-LA,\* B. A. PERKINS, I. M. BORTOLOTTO, O. A. TAKANO, G. A. DA SILVA, K. IRINO, M. C. C. BRANDILEONE, J. D. WENGER, and C. V. BROOME. Sao Paulo and Mato Grosso State Depts. of Health, Brazil, and CDC, Atlanta, Ga.
- C301.** Characterization of *Haemophilus influenzae* Isolates in Jamaica: Serotypes, Biotypes, and  $\beta$ -Lactamase Production. (117) L. RAINFORD and P. PRABHAKAR.\* Dept. of Microbiol., Univ. of the West Indies, Mona, Jamaica.
- C302.** Polymerase Chain Reaction Typing of *Helicobacter pylori*. (119) R. MOORE,\* A. KUREISHI, S. WONG, and L. E. BRYAN. Univ. of Calgary Health Sci. Ctr., Calgary, Alberta, Canada.
- C303.** Outbreak of *Klebsiella pneumoniae* Septicemia in a Neonatal Intensive Care Unit. (121) K. M. HARVEY,\* D. KISKA, F. MACRINA, S. KORB, A. LAMB, R. DUMA, F. MEIER, and H. DALTON. Dept. of Pathology, Med. Col. of Virginia, Richmond.
- C304.** Environmental "Containment" of *Legionella pneumophila* in an Acute Care Hospital. (123) M. J. JAQUA-STEWART, M. J. HEFFERNAN,\* J. POTTINGER, J. SCHNEIDER, A. G. SALEM, and D. W. HUMPHREYS. Univ. of South Dakota Sch. of Med. and VA Med. Ctr., Sioux Falls.

- C305.** Geographic Distribution of Electrophoretic Types of *Listeria monocytogenes* from a Surveillance Study of Listeriosis in the United States. (125) M. REEVES,\* S. HUNTER, R. WEAVER, P. HAYES, J. WENGER, and B. SWAMINATHAN. CDC, Atlanta, Ga.
- C306.** A DNA Probe Derived from *Moraxella catarrhalis* Is Useful for Epidemiologic Studies. (127) D. R. REAGAN,\* E. S. WALKER, M. L. GRIGGS, B. W. FRANZUS, and F. A. SARUBBI. Mountain Home VA Med. Ctr. and James H. Quillen Col. of Med., Johnson City, Tenn.
- C307.** Pulsed-Field Gel Electrophoresis of *Mycobacterium tuberculosis*. (129) A. R. WANGER\* and L. Y. ARMITIGE. Univ. of Texas Med. Sch., Houston.
- C308.** Epidemiological Studies on *Neisseria gonorrhoeae* Isolated in Mainland China. (131) W. G. FENG, S. I. EGGLESTONE, G. Q. YUAN, J. Z. ZHONG, B. S. W. HO,\* and W. H. P. LEWIS. Hong Kong Polytechnic, Hong Kong, and Guangzhou STD Monitoring Ctr., Guangzhou, China.
- C309.** Pyocin Typing and Antibiogram of *Pseudomonas aeruginosa* Strains Isolated from Four Hospitals. (133) F. MALEKZADEH,\* E. ABDALI, and M. SHAHAMAT. Univ. of Tehran, Tehran, Iran, and Univ. of Maryland, College Park.
- C310.** Evidence for Spread of Closely Related Strains of *Salmonella enteritidis* in Bulgaria. (135) M. P. BRATOEVA,\* L. M. ATKINS, D. MOLLOV, and J. F. JOHN. Res. Inst. of Infectious and Parasitic Diseases, Sofia, Bulgaria, and Med. Univ. of South Carolina, VA Med. Ctr., Charleston.
- C311.** Epidemiological Analysis of Amikacin Resistance in *Serratia marcescens* from Clinical Isolates during a 5-Year Period. (137) D. CENTRON GARCIA,\* S. KAUFMAN, M. WOLOJ, and S. PINEIRO. Univ. of Buenos Aires, Hosp. Fernández. Hosp. de Niños R. Gutierrez, and Nat. Council of Res., BioSidus Lab., Buenos Aires, Argentina.
- C312.** Coagulase-Negative Staphylococcal Urinary Tract Infections in Adolescent Females. (139) K. M. HARVEY,\* B. A. JOHNSON, F. A. MEIER, and H. P. DALTON. Dept. of Pathology, Med. Col. of Virginia/Virginia Commonwealth Univ., Richmond.
- C313.** Coagulase-Negative Staphylococci in Blood Cultures: Epidemiology and Immunoblot Typing. (141) R. SHERMAN,\* M. MULLIGAN, W. GORNICK, R. KWOK, L. FLIONIS, J. SHIGEI, R. HOLLIS, M. PFALLER, and L. THRUPP. Univ. of California Med. Ctr., Irvine; Long Beach VA Med. Ctr., Long Beach, Calif.; and Univ. of Iowa, Iowa City.
- Session 276 (C). CLOSTRIDIUM DIFFICILE TOXIN DETECTION**
- C314.** Comparison of Cell Culture Cytotoxicity, Latex Agglutination, and Enzyme Immunoassays for Detection of *Clostridium difficile*-Associated Disease. (143) N. PATEL,\* I. DAS-KAL, and J. MOGHADDAS. Albert Einstein Med. Ctr., Philadelphia, Pa.
- C315.** Cell Culture Assay and Enzyme Immunoassay for the Diagnosis of *Clostridium difficile*-Associated Diarrhea. (145) I. HOSNY,\* R. B. THOMSON, JR., and C. C. BOSTICK. Akron City Hosp. and Northeastern Ohio Univ. Col. of Med., Akron.
- C316.** Comparison of the Premier Toxin A Kit with Cytotoxin B and Culture for the Detection of *Clostridium difficile* Toxins in Fecal Specimens. (147) D. BARTKOWIAK and C. PIERSON,\* Univ. of Michigan, Ann Arbor.
- C317.** Multicenter Evaluation of Two New Enzyme Immunoassays for Diagnosis of *Clostridium difficile*-Associated Disease. (149) G. M. THORNE,\* P. A. HANFF, J. GREATORREX, J. HAYEK, G. DESAI, J. CARLSON, A. CHENG, M. DE-COURCEY, and P. C. DEGIROLAMI. Children's Hosp., New England Deaconess Hosp., Beth Israel Hosp., and Harvard Med. Sch., Boston, Mass.
- C318.** Evaluation of the *Clostridium difficile* TOX-A TEST Enzyme Immunoassay. (151) R. D. MARTINEZ\* and D. J. HARDY. Baxter Diagnostics Inc., Aguada, Puerto Rico, and Univ. of Rochester Med. Ctr., Rochester, N.Y.
- C319.** Evaluation of the Tech Lab Tox-A Enzyme Immunoassay for Rapid Diagnosis of *Clostridium difficile*-Associated Colitis. (153) J. HAYEK,\* G. DESAI, J. CARLSON, K. EICHELBERGER, G. THORNE, J. GREATORREX, P. HANFF, and P. C. DE GIROLAMI. New England Deaconess Hosp., Children's Hosp., Beth Israel Hosp., and Harvard Med. Sch., Boston, Mass.
- C320.** Comparison of Three Toxin A Assays with Toxin B, Latex Agglutination, and Culture for the Diagnosis of *Clostridium difficile*-Induced Diarrhea. (155) B. C. SCHIEVEN,\* M. BINNING, D. BARBER, Z. HUSSAIN, and R. LANNIGAN. Victoria Hosp., London, Ontario, Canada.
- C321.** Comparison of *Clostridium difficile* Toxin A Enzyme Immunoassay with Cytotoxin B Tissue Culture Technique. (157) J. KEISER, M. HIRSCHMANN,\* J. ROBERTSON, K. WRIGHT, and M. CAPARAS. George Washington Univ. Med. Ctr., Washington, D.C., and Baxter Diagnostics, Inc.
- C322.** Comparison of Three Laboratory Methods for Diagnosis of *Clostridium difficile*-Associated Intestinal Diseases. (159) F. BARBUT,\* F. CABURET, and J. C. PETIT. Dept. of Microbiol., Saint-Antoine Hosp., Paris, France.
- C323.** Evaluation of the TechLab *Clostridium difficile* Toxin A Enzyme Immunoassay. (161) D. WARSHAUER,\* L. BARTTELL, and J. PALOUCEK. Med. Sci. Lab., Wauwatosa, Wis.
- C324.** Comparison of *Clostridium difficile* Cytotoxin Assay with Enzyme Immunoassay. (163) M. MORRIS,\* C. BELASKI, L. BREEDEN, and M. WRIGHT. American Med. Lab., Inc., Fairfax, Va.
- C325.** Comparison of Two Commercially Available Rapid Tests for Detection of *Clostridium difficile* in Stool. (165) S. SAYAHTAHERI ALTAIE,\* K. HARVEY, M. WALLACE, F. MEIER, and H. DALTON. SUNY/buffalo Sch. of Med. and Children's Hosp., Buffalo, N.Y., and Med. Col. of Virginia, Richmond.
- C326.** Laboratory Comparison of Two *Clostridium difficile* Toxin Assays. (167) C. A. GLEAVES, J. BROWN, and R. DWORNIK.\* Providence Med. Ctr., Portland, Ore.
- C327.** Four Enzyme Immunoassays for Detection of *Clostridium difficile* Toxins. (169) C. S. MERZ,\* M. FORMAN, L. GLUCK, K. MILLS, K. SENFT, I. STEIMAN, N. WALLACE, and C. KRAMER. Johns Hopkins Med. Inst., Baltimore, Md.
- C328.** Comparison of Three Rapid Assays for *Clostridium difficile* Disease. (171) S. H. ESCOTT,\* J. S. DALY, and D. M. L'ESPERANCE. Med. Ctr. of Central Massachusetts, Worcester.
- C329.** Detection of *Clostridium difficile* Toxins by Three Methods. (173) L. EVANS, L. FOSTER,\* and P. HARRIS. Nichols Inst. Lab., Irving, Tex., and Baxter/Bartels Diagnostics Div., Issaquah, Wash.
- C330.** Comparison of Four Enzyme Immunoassay Methods and the Vidas-CDA with the Tissue Culture Cytotoxin Assay for Detection of *Clostridium difficile* Toxins. (175) P. GIALANELLA,\* M. MOTYL, J. SAGURTON, D. MYVETT, R. GIARDINA, and J. MCKITRICK. Montefiore Med. Ctr., Albert Einstein Col. of Med., Bronx, N.Y.
- C331.** Comparison of Enzyme-Linked Immunoassay Systems for Detection of *Clostridium difficile* Toxin. (177) S. I. SEIFERT, A. DINUZZO,\* J. BUCKNER, and O. AGBEDE. Dept. of Pathology, Univ. of Texas Med. Branch, Galveston

- C332.** Comparison of the Vitek VIDAS *Clostridium difficile* Toxin A Assay with Two Manual Enzyme Immunoassays. (179) R. C. BUTLER\* and C. T. MURPHY. Arlington Hosp., Arlington, Va.
- C333.** Evaluation of Toxin A-Specific Enzyme Immunoassays for the Diagnosis of *Clostridium difficile*-Associated Disease. (181) P. S. WHITTIER,\* K. WAIT, L. MCMILLON, W. KELLY, D. SHAPIRO, and P. GILLIGAN. Univ. of North Carolina Hosp., Chapel Hill.
- C334.** Results of Four New *Clostridium difficile* Toxin Assays and Conventional Tissue Culture Cytotoxin Assay Correlated with Clinical Disease. (183) C. FOWLER,\* E. WILLIAMS, N. NELSON, A. MCNAMARA, and V. GILL. NIH, Bethesda, Md.
- C335.** Developmental Study for Simple 1-h VIDAS CDA Assay Using a Novel Filtration Device. (185) K. HOFFMAN and B. RICE.\* BioMerieux Vitek, Inc., Rockland, Mass.
- C336.** Comparison of VIDAS CDA and Premier *C. difficile* Toxin A Assay versus Cytotoxin B Tissue Culture Assay for the Detection of Toxins of *Clostridium difficile*. (187) C. C. KNAPP,\* R. L. SANDIN, M. D. LUDWIG, G. KARASKY-HALL, I. RUTHERFORD, and J. A. WASHINGTON. Cleveland Clin. Fndn., Cleveland, Ohio, and H. Lee Moffitt Cancer Ctr., Tampa, Fla.
- C337.** Evaluation of *Clostridium difficile* TOX-A TEST for Detection of *C. difficile* Toxin A. (189) M. J. JAQUASTEWART, J. TICHOTA-LEE, M. E. CLARK,\* L. W. SCHAFER, and R. A. JAQUA. Univ. of South Dakota Sch. of Med. and VA Med. Ctr., Sioux Falls.
- C338.** Development of a 70-min, Two-Step Enzyme Immunoassay Specific for *Clostridium difficile* Toxin A. (191) V. Y. PERERA,\* T. IMADA, H. KOHNO, and S. ANAOKA. Seradyn Inc., Indianapolis, Ind., and Mitsubishi Kasei Corp., Yokohama, Japan.

### Session 277 (F). HOST-PATHOGEN INTERACTIONS IN FUNGAL INFECTION

- F99.** Serological Evaluation and Antigenic Characterization of a Chitinase Produced by *Coccidioides immitis*. (193) S. M. JOHNSON\* and D. PAPPAGIANIS. Univ. of California, Davis.
- F100.** Comparison of Classical Serologic Methods with Premier *Coccidioides* Enzyme Immunoassay during a *Coccidioidomycosis* Epidemic in Kern County, Calif. (195) R. TALBOT,\* C. BURKE, R. WETHINGTON, and W. GADE. Kern County Health Dept., Bakersfield, Calif., and Meridian Diagnostics, Inc., Cincinnati, Ohio.
- F101.** Cloning and Expression of an Immunoreactive Protein from *Coccidioides immitis*. (197) K. M. VILLAREAL,\* C. R. ZIMMERMAN, K. O. DUGGER, and J. N. GALGIANI. Univ. of Arizona, Tucson, and Univ. of California, Davis.
- F102.** Identification of Clones That Encode a Major Antigen of *Blastomyces dermatitidis* by Immunological Screening of a cDNA Expression Library. (199) B. S. KLEIN,\* L. H. HOGAN, and J. M. JONES. Univ. of Wisconsin, Madison.
- F103.** Antigens of *Pythium insidiosum* Recognized in Sera of Horses with Active Pythiosis. (201) L. MENDOZA,\* V. NICHOLSON, and J. PRESCOTT. Dept. of Vet. Microbiol. and Immunol., Univ. of Guelph, Guelph, Ontario, Canada.
- F104.** Evaluation of Cation Exchange Chromatography for Separating the H and M Antigens from Histoplasmin. (203) R. M. ZANCOPE-OLIVEIRA,\* S. L. BRAGG, S. F. HURST, and E. REISS. Oswaldo Cruz Fndn., Rio de Janeiro, Brazil, and CDC, Atlanta, Ga.
- F105.** Induction of Stress Proteins in *Histoplasma capsulatum* by pH 4, H<sub>2</sub>O<sub>2</sub>, and 40°C. (205) K. KAMEI, E. BRUMMER,\*

- K. CLEMONS, and D. A. STEVENS. Santa Clara Valley Med. Ctr. and California Inst. of Med. Res., San Jose, and Stanford Univ., Stanford, Calif.
- F106.** Release of *Candida* Cytoplasmic Antigens following Phagocytosis of Yeast Cells by Human Neutrophils. (207) C. ASHLEY,\* R. RENNIE, and B. ZIOLA. Dept. of Microbiol., Col. of Med., Univ. of Saskatchewan, Saskatoon, Saskatchewan, Canada.
- F107.** Utilization of Ferroprotein by *Candida albicans* during Candidastasis by Transferrin. (209) Y. HAN\* and D. LUPAN. Dept. of Microbiol. and Cell and Molecular Biol. Program, Univ. of Nevada, Reno.
- F108.** Delta-9-Tetrahydrocannabinol Inhibition of Human Natural Killer Cell Response to *Candida albicans*. (211) J. Y. DJEU,\* D. SERBOUSEK, A. TAYLOR, and D. KUSHER. Dept. of Med. Microbiol., Univ. of South Florida Col. of Med., Tampa.
- F109.** Interactions of Monophosphoryl Lipid A with *Candida albicans*-Mannan-Specific Suppressor Cells. (213) J. DOMER,\* L. GUTIERREZ, G. ANDERSEN, J. RUDBACH, and G. ASHERSON. Tulane Univ., New Orleans, La.; RIBI Immunochem Res. Inc., Hamilton, Mont.; and Clin. Res. Ctr., Harrow, England.
- F110.** Comparative Effect of Four Antifungal Agents on Macrophage Secretion of Tumor Necrosis Factor and the Attenuation of This Effect by Pentoxifylline, Liposomal Vesicles, and Dexamethasone. (215) A. LOUIE,\* A. L. BALTCH, M. A. FRANKE, R. P. SMITH, P. MICHELSEN, and D. M. DIXON. Stratton VA Med. Ctr., Albany Med. Col., and New York State Dept. of Health, Albany.
- F111.** Tumor Necrosis Factor Production by Murine Macrophages Incubated with High or Low Virulence *Candida albicans* Strains and Its Modulation by Pentoxifylline or Dexamethasone. (217) A. LOUIE,\* A. L. BALTCH, M. A. FRANKE, P. MICHELSEN, and D. M. DIXON. Stratton VA Med. Ctr., Albany Med. Col., and New York State Dept. of Health, Albany.
- F112.** Cytokine Pattern of Conidial-Induced Murine Pulmonary Blastomycosis. (219) S. A. MOSER,\* L. E. GROSSO, and D. L. LACEY. Dept. of Pathology, Univ. of Alabama, Birmingham, and Dept. of Pathology, Jewish Hosp. and Washington Univ. Sch. of Med., St. Louis, Mo.

### Session 278 (U). MYCOBACTERIAL DRUG RESISTANCE AND SUSCEPTIBILITY

- U83.** Bioavailability of Antimycobacterial Drugs for Prolonged Periods following Single Implants. (221) S. KAILASAM,\* S. SRINIVASAN, D. L. WISE, and P. R. J. GANGADHARAM. Univ. of Illinois, Chicago, and Northeastern Univ., Boston, Mass.
- U84.** Activity of Clarithromycin against Slow-Growing Nontuberculous Mycobacteria Using a Broth Microdilution MIC System. (223) B. A. BROWN\* and G. O. ONYI. Univ. of Texas Health Ctr., Tyler.
- U85.** Clarithromycin at Very Low Levels and on Intermittent Administration Consistently Inhibits the Growth of *Mycobacterium leprae* in Mice. (225) R. H. GELBER,\* P. SIU, I. MURRAY, and M. TSANG. Kuzell Inst., San Francisco, Calif., and G. W. Long Hansen's Disease Ctr., Carville, La.
- U86.** Resistance Pattern of *Mycobacterium avium* Complex (MAC) Strains Isolated from MAC-Infected AIDS Patients and Beige Mice during Treatment with Clarithromycin. (227) J. GROSSET, F. DOUCET-POPULAIRE,\* C. TRUFFOT, V. JARLIER, and B. JI. Pitié-Salpêtrière Sch. of Med., Paris, France.

- U87.** Use of Isoniazid Screening To Determine Multi-Drug-Resistant Tuberculosis in Michigan. (229) B. ROBINSON-DUNN,\* D. BERRY, S. CHURCH, and C. STUDER. Michigan Dept. of Publ. Health, Lansing.
- U88.** Frequency of Pyrazinamide-Resistant *Mycobacterium tuberculosis* Strains. (231) M. SALFINGER. Dept. of Med. Microbiol., Univ. of Zurich, Zurich, Switzerland.
- U89.** Isolation and Characterization of *Mycobacterium avium* Genes Involved in Ethambutol Resistance. (233) A. E. STANLEY,\* J. T. BELISLE, and J. M. INAMINE. Colorado State Univ., Fort Collins.
- U90.** Combined Inhibitory Effect of Ethambutol and Teicoplanin against *Mycobacterium avium* Complex. (235) N. GLOVER,\* O. G. W. BERLIN, A. HOLTZMAN, T. ARONSON, and S. FROMAN. Olive View and UCLA Med. Ctr., Los Angeles, Calif.
- U91.** In Vitro Combination Effect of Ethambutol and Erythromycin against *Mycobacterium avium* Complex. (237) O. G. W. BERLIN,\* S. M. NOVAK, and A. C. SHUM. UCLA Med. Ctr., Los Angeles, Calif.
- U92.** In Vitro Activity of a New Dihydrofolate Reductase Inhibitor against *Mycobacterium avium* Complex. (239) S. MAJUMDER and M. H. CYNAMON.\* Veterans Affairs Med. Ctr. and SUNY Health Sci. Ctr., Syracuse, N.Y.
- U93.** In Vitro Activities of Benzoxazinorifamycin (KRM-1648) against *Mycobacterium avium* Complex. (241) H. SAITO,\* K. FUJII, H. TOMIOKA, K. SATO, and T. HIDAHA. Shimane Med. Univ., Izumo, Shimane, Japan.
- U94.**  $\beta$ -Lactamase of Mycobacteria and the In Vitro Synergistic Activities of Various  $\beta$ -Lactams Combined with the  $\beta$ -Lactamase Inhibitor, YTR-830H. (243) H. TOMIOKA, H. H. KWON, and H. SAITO.\* Shimane Med. Univ., Izumo, Shimane, Japan.
- U95.** Pharmacokinetic Evaluation of Aconiazide, a Potentially Less Toxic Isoniazid Prodrug. (245) C. A. PELOQUIN,\* G. T. JAMES, M. KIM, and M. D. ISEMAN. Nat. Jewish Ctr. for Immunology and Respiratory Med., Denver, Colo.
- U96.** Activity of Rifabutin against *Mycobacterium avium* Complex in Beige Mice. (247) S. P. KLEMENS,\* M. A. GROSSI, and M. H. CYNAMON. Veterans Affairs Med. Ctr. and SUNY Health Sci. Sci., Syracuse, N.Y.
- U97.** In Vitro Activity of Ofloxacin against Multiple-Drug-Resistant *Mycobacterium tuberculosis*. (249) M. J. BEREZNEY and E. M. SORDILLO.\* St. Luke's-Roosevelt Hosp. Ctr., New York, N.Y.
- U98.** Bactericidal Activity of the Combination of Quinolones and Clofazimine with *Mycobacterium avium*. (251) L. HEIFETS and P. LINDHOLM-LEVY.\* Nat. Jewish Ctr. for Immunology and Respiratory Med., Denver, Colo.
- U99.** Function of the Electron-Transparent Zone: a Comparative Study. (253) R. COLES,\* M. MEYENHOFER, and V. K. JANSONS. Dept. of Microbiol. and Molecular Genetics and Dept. of Anatomy, Cell Biol. and Injury Sci., Univ. of Med. and Dent. of New Jersey-New Jersey Med. Sch., Newark.
- U100.** Rapid Susceptibility Testing of *Mycobacterium chelonae* and *Mycobacterium fortuitum* Using a Predefined Antibiotic Gradient. (255) S. HOFFNER,\* L. KLINTZ, B. OLSSON-LILJEQUIST, A. BOLMSTROM, and A. KARLSSON. Nat. Bacteriol. Lab. and AB Biodisk, Solna, Sweden.
- U101.** Increased Susceptibility of *Mycobacterium avium* to Antimycobacterial Drugs after Preeposure to Sub-MIC Concentrations of Ethambutol. (257) U. HJELM, G. KALLEN-IUS, and S. E. HOFFNER.\* Dept. of Bacteriol., Nat. Bacteriol. Lab., Stockholm, Sweden.
- U102.** Increase of pH of 12B Medium by Various Means and Its Effect on Growth of *Mycobacterium avium* Complex. (259) S. B. BEATY,\* S. SIDDIQI, and M. GNACEK. BDDIS Res. & Development, Sparks, Md.
- U103.** Reversal of Drug Resistance of *Mycobacterium leprae*. (261) K. PRABHAKARAN,\* E. B. HARRIS, B. RANDHAWA, and R. C. HASTINGS. Lab. Res. Branch, G. W. Long Hansen's Disease Ctr., Carville, La.
- U104.** Monitoring Multidrug Therapy in Lepromatous Leprosy Patients by Using Polymerase Chain Reaction: a Prospective Study. (263) D. L. WILLIAMS,\* G. P. CHAN, and T. P. GILLIS. G. W. Long Hansen's Disease Ctr., Carville, La., and Res. Inst. for Tropical Med., Manila, Philippines.
- U105.** Antimycobacterial Spectrum of Clarithromycin and Its Activity against *Mycobacterium avium* and *M. paratuberculosis* Growing in Murine or Human Macrophages. (265) N. RASTOGI, V. LABROUSSE, K. S. GOH, and J. P. CARVALHO DE SOUSA. Unité de la Tuberculose & des Mycobactéries, Inst. Pasteur, Paris, France.

## Session 279 (A). CLINICAL TRIALS AND EFFICACY IN ANIMALS

- A125.** Cefotaxime Twice Daily versus Ceftriaxone Once Daily: a Randomized, Controlled Study in Serious Infections. (267) B. P. SIMMONS,\* M. S. GELFAND, J. GROGAN, D. WINTERS, and N. AMARSHI. Methodist Hosp., Memphis, Tenn.
- A126.** Randomized Trial of Ceftriaxone versus Ciprofloxacin in Treatment of Typhoid Fever. (269) M. WALLACE\* and A. YOUSIF. Salmaniya Med. Ctr., Manama, Bahrain.
- A127.** Multicenter Study of Cefepime in Treatment of Infections of the Urinary Tract, Lower Respiratory Tract, and Skin and Skin Structures. (271) R. CRAFT\* and THE CEFEPIME MULTICENTER STUDY GROUP. Methodist Hosp., Memphis, Tenn.
- A128.** Prevalence and Possible Induction of  $\beta$ -Lactamase in Patients with Female Genital Tract Infections. (273) C. PEYTON\* and M. MARTENS. Univ. of Texas Med. Branch, Galveston.
- A129.** Timentin versus Combination Therapy in the Treatment of Intra-Abdominal Infections. (275) S. DOUGHERTY,\* S. KAPLAN, M. FINK, T. FABIAN, D. H. MARTIN, B. WIEDERMANN, K. SIRINEK, and J. FORTSON. Texas Tech. Univ., El Paso; Texas Children's Hosp., Houston; Univ. of Massachusetts Med. Ctr., Worcester; Univ. of Tennessee Med. Ctr., Memphis; Louisiana State Univ. Sch. of Med., New Orleans; Children's Nat. Med. Ctr., Washington, D.C.; Univ. of Texas Health Sci. Ctr., San Antonio; and SmithKline Beecham Pharmaceuticals, Philadelphia, Pa.
- A130.** Short-Course Intravenous Ampicillin/Sulbactam followed by Oral Amoxicillin/Clavulanic Acid in Community-Acquired Pneumonia in the Elderly. (277) J. RAMIREZ\* and M. RAFF. Univ. of Louisville, Louisville, Ky.
- A131.** Cefoperazone plus Sulbactam versus Cefoperazone against Disseminated *Escherichia coli* Infection in Neutropenic Mice. (279) P. H. CHANDRASEKAR\* and J. A. SLUGHAK. Wayne State Univ., Detroit, Mich.
- A132.** Imipenem in Experimental Methicillin-Susceptible Staphylococcal Foreign Body Infections. (281) H. SCHAAD, C. CHUARD,\* F. A. WALDVOGEL, and D. P. LEW. Univ. Hosp., Geneva, Switzerland
- A133.** Efficacy of Prophylaxis with Cefazolin versus Cefpirome in an In Vivo Model of *Staphylococcus aureus* Wound Infection. (283) D. S. KERNODLE\* and A. B. KAISER. Vanderbilt Univ. Sch. of Med., Nashville, Tenn.
- A134.** Emergence of Resistance to Imipenem in *Enterobacter* Masquerading as *Klebsiella pneumoniae* during Therapy with Imipenem/Cilastatin. (285) A. F. EHRHARDT,\* C. C. SANDERS, K. S. THOMSON, C. WATANAKUNAKORN, and I. TRUJILLANO-MARTIN. Creighton Univ. Sch. of

- Med., Omaha, Neb.; Northeastern Ohio Univ. Col. of Med., Youngstown; and Hosp. Clin. Univ., Salamanca, Spain.
- A135.** Multiresistant Nontyphoid *Salmonella* in Argentinian Pediatric Hospitals. (287) A. ROSSI, M. WOŁOJ, G. GUTKIND,\* M. QUINTEROS, M. MARINO, H. LOPARDO, A. PICANDET, M. FERNANDEZ COBO, R. HARE, and G. MILLER. Inst. Nacional de Microbiol., Htal. H. P. Garrahan, S. M. Ludovica, R. Gutierrez, and Univ. de Buenos Aires, Buenos Aires, Argentina, and Schering-Plough Corp., N.J.
- A136.** Bacterial Translocation in Patients Undergoing Elective Colorectal Surgery. (289) M. KOHA, B. BRISMAR, B. WIKSTROM, and C. E. NORD.\* Huddinge Univ. Hosp., Karolinska Inst., and Nat. Bacteriol. Lab., Stockholm, Sweden.

### Session 280 (D). ENTERIC PATHOGENS

- D203.** *Cryptosporidium* spp. Prevalence in a Private Hospital. (291) F. ROSSI,\* D. B. ANDREAZZI, M. SONODA, M. E. C. VILHENA, and A. L. COSCINA. Albert Einstein Hosp., São Paulo, Brazil.
- D204.** Production of an Extracellular Serine Protease by *Clostridium difficile*. (293) J. VESSELLA and J. F. SPERRY.\* Univ. of Rhode Island, Kingston.
- D205.** Restriction Endonuclease Analysis of Chromosomal DNAs from *Campylobacter* and *Helicobacter* Species. (295) W. R. EDWARDS,\* K. M. HARTLINE, and P. EDMONDS. Sch. of Biol., Georgia Inst. of Technology, Atlanta.
- D206.** Detection of *Campylobacter jejuni* and *Campylobacter coli* Using the Polymerase Chain Reaction. (297) B. A. OYOFO,\* S. A. THORNTON, D. H. BURR, T. J. TRUST, O. PAVLOVSKIS, and P. GUERRY. Naval Med. Res. Inst., Bethesda, Md., and Dept. of Biochemistry and Microbiol., Univ. of Victoria, Victoria, British Columbia, Canada.
- D207.** Characterization of Two Novel DNA *Campylobacter* Probes. (299) E. CALVA, V. BUSTAMANTE,\* M. FERNANDEZ, M. BOBADILLA, L. SANCHEZ, and J. L. PUENTE. Inst. de Biotecnología UNAM, Cuernavaca, Mor., Mexico.
- D208.** Molecular Cloning of a RecA-Like Gene from *Campylobacter*. (301) P. POPE,\* S. JOSEPH, and P. GUERRY. Naval Med. Res. Inst., Bethesda, Md., and Dept. of Microbiol., Univ. of Maryland, College Park.
- D209.** Transformation and Plasmid Vector Construction in *Helicobacter pylori*. (303) Y. WANG\* and D. E. TAYLOR. Univ. of Alberta, Edmonton, Alberta, Canada.
- D210.** Adhesion of *Helicobacter pylori* to Human and Rodent Stomach In Vitro. (305) P. FALK,\* K. ROTH, T. U. WESTBLOM, J. GORDON, and S. NORMARK. Washington Univ. Sch. of Med. and St. Louis Univ. Sch. of Med., St. Louis, Mo.
- D211.** Distinctive Features of *Helicobacter pylori* Adhesion to Eukaryotic Cells In Vitro. (307) M. DYTOC,\* C. LINGWOOD, M. LOUIE, M. HUESCA, S. CROWE, J. BRUNTON, and P. SHERMAN. Univ. of Toronto, Toronto, Ontario, Canada.
- D212.** Characterization of a Ferritinlike Protein from *Helicobacter pylori*. (309) B. FRAZIER, J. PFEIFER, P. FALK,\* T. U. WESTBLOM, and S. NORMARK. Washington Univ. Sch. of Med. and St. Louis Univ. Sch. of Med., St. Louis, Mo.
- D213.** *Escherichia coli* with Enteropathogenic *E. coli* and Shiga-Like Toxin Sequences in Seattle Children: a Prospective Study. (311) T. BOKETE, C. O'CALLAHAN, C. CLAUSEN, N. TANG, T. FRITSCHÉ, and P. TARR.\* Univ. of Washington, Seattle.
- D214.** Mitomycin C Induction of a 3,000-Fold Increase in Synthesis of a Shiga-Like Toxin from Enteropathogenic *Esche-*

- richia coli* H18. (313) A. J. YEE\* and C. L. GYLES. Agriculture and Food Safety Branch, Ontario Ministry of Agriculture and Food, and Univ. of Guelph, Guelph, Ontario, Canada.
- D215.** Comparison of Hemolytic and Lympholytic Activities of *Escherichia coli* Hemolysin Mutants. (315) G. E. ROWE,\* S. PELLETT, and R. A. WELCH. Univ. of Wisconsin, Madison.
- D216.** Epidemiological Studies and Characterization of Enterotoxigenic *Escherichia coli* STA1 Isolated from Children in Mexico. (317) M. M. P. ARENAS-HERNANDEZ,\* B. ESPINOLA-HUERTA, J. I. ROSAS-ARCOS, S. GARCIA-GARCIA, Y. MARTINEZ-LAGUNA, and B. E. BACA. Dept. de Investigaciones Microbiol., Univ. Autónoma de Puebla, Puebla, Mexico.
- D217.** Identification of a Mannose-Resistant Candidate Adhesin of *Escherichia coli* O157:H7. (319) P. TARR,\* N. TANG, and S. MOSELEY. Univ. of Washington, Seattle.
- D218.** Sequence Variation in the 3' End of Attaching and Effacing *eae* Gene Homologs among Verotoxin-Producing *Escherichia coli*. (321) M. LOUIE, J. DEAZAVEDO,\* R. CLARKE, and J. L. BRUNTON. Samuel Lunenfeld Res. Inst. of Mount Sinai Hosp., Toronto, Ontario, Canada, and Agriculture Canada, Guelph, Ontario, Canada.
- D219.** Characterization of Shiga-Like Toxin Genes in *Escherichia coli* Strains from Patients with Hemorrhagic Colitis, Hemolytic Uremic Syndrome, and Thrombotic Thrombocytopenic Purpura. (323) N. A. STROCKBINE,\* C. VALENCIA, C. A. VALENCIA, S. M. OSTROFF, and O. OLSVIK. CDC, Atlanta, Ga.
- D220.** Virulence Genes of the *Salmonella typhimurium* Virulence Plasmid Are Regulated in SpvR-Dependent and SpvR-Independent Manners by Growth Phase, Complexity of Growth Medium, and Certain Amino Acids. (325) J. A. ROGERS,\* V. A. CHIODO, S. SCHRECK, and P. A. GULIG. Univ. of Florida Col. of Med., Gainesville.
- D221.** Isolation of Multiple-Drug-Resistant *Salmonella typhi* from Fever Hospitals in Cairo and Alexandria, Egypt. (327) T. MAPES,\* E. J. THRELFALL, L. R. WARD, B. ROWE, A. MOURAD, A. NOUR EL-DIN, N. AYAD, A. L. BOURGEOIS, and J. MURPHY. NAMRU-3, Cairo, Egypt; Central Publ. Health Lab., London, England; and Alexandria Med. Sch., Alexandria, Egypt.
- D222.** Comparison of Aerogenic and Anaerogenic Strains of *Shigella boydii* 14. (329) E. G. SOWERS,\* T. POPOVIC, and N. A. STROCKBINE. CDC, Atlanta, Ga.

### Session 281 (B). ENTEROTOXINS

- B288.** Mutational Analysis of Ganglioside-Binding Activity of *Escherichia coli* Type II Heat-Labile Enterotoxin. (331) T. D. CONNELL\* and R. K. HOLMES. Uniformed Services Univ. of the Health Sci., Bethesda, Md.
- B289.** Effect of Single Amino Acid Changes on the ADP-Ribosyltransferase Activity of *Escherichia coli* Heat-Labile Toxin Subunit A. (333) C. C. R. GRANT,\* R. J. MESSER, and W. CIEPLAK, JR. Rocky Mountain Lab., Nat. Inst. of Allergy and Infectious Diseases, Hamilton, Mont.
- B290.** Mutagenesis and Epitope Mapping of Cholera Toxin B Subunit. (335) M. G. JOBLING\* and R. K. HOLMES. Uniformed Services Univ. of the Health Sci., Bethesda, Md.
- B291.** Effects of Site-Directed Mutagenesis on Cholera Toxin A1 Subunit ADP-Ribosyltransferase Activity. (337) H. R. KASLOW,\* B. PLATLER, V. L. MAR, and W. N. BURNETTE. USC Sch. of Med., Los Angeles, Calif., and Amgen Inc., Thousand Oaks, Calif.
- B292.** Localization of Cholera Toxin Sensitivity (*ets*) Genes in Mouse Chromosomal DNA. (339) S. H. RICHARDSON.

- Bowman Gray Sch. of Med., Wake Forest Univ., Winston-Salem, N.C.
- B293.** Accessory Cholera Enterotoxin (Ace), a New Enterotoxin of *Vibrio cholerae*. (341) J. GALEN, M. TRUCKSIS,\* J. MICHALSKI, A. FASANO, and J. KAPER. Ctr. for Vaccine Development, Univ. of Maryland, Baltimore.
- B294.** Expression and Characterization of the Cloned *Salmonella typhimurium* Enterotoxin. (343) R. PRASAD,\* A. K. CHOPRA, P. CHARY, and J. W. PETERSON. Dept. of Microbiol., Univ. of Texas Med. Branch, Galveston.
- B295.** Autocatalytic Proteolysis of the Extracellular Precursor of the Heat-Stable Enterotoxin of *Escherichia coli*. (345) Y. YANG,\* K. RASHEED, K. TACHIAS, L.-M. GUZMAN-VERDUZCO, and Y. M. KUPERSZTOCH. Univ. of Texas Southwestern Med. Ctr., Dallas.
- B296.** Gene Fusion of *Escherichia coli* Heat-Stable Enterotoxin b Gene (*estB*) and *malE*: Analysis of the Fusion Protein. (347) M. BOSSE, C. E. HANDL, L. A. LORTIE, J. HAREL, and J. D. DUBREUIL.\* Dept. of Pathology and Microbiol., Faculty of Vet. Med., Montreal Univ., St-Hyacinthe, Quebec, Canada, and Ctr. for Biotechnology, Karolinska Inst., Novum, Huddinge, Sweden.
- B297.** Heat-Stable Enterotoxin Production among *Aeromonas* Strains Isolated from Patients with and without Diarrhea in Lagos, Nigeria. (349) S. A. ALABI,\* J. A. OMONOGBEHIN, S. AWOYOMI, and T. ODUGBEMI. Microbiol. Div., Nat. Inst. for Med. Res., Yaba, Lagos, Nigeria.
- B298.** Development of Neutralizing Antibodies Directed against *Escherichia coli* Heat-Stable Enterotoxin (ST) by Oral Immunization with a Heat-Labile Toxin B/ST Fusion Peptide. (351) L. CARDENAS\* and J. D. CLEMENTS. Tulane Univ. Sch. of Med., New Orleans, La.
- B299.** Broad Distribution of Verotoxin Type 2 Variant B Subunit Genes in Human Isolates of Verotoxin-Producing *Escherichia coli*. (353) D. PIERARD,\* D. STEVENS, S. LAUWERS, and H. LIOR. Academic Hosp., Free Univ. Brussels, Brussels, Belgium, and Nat. Lab. for Enteric Pathogens, Lab. Ctr. for Disease Control, Ottawa, Ontario, Canada.
- B300.** Endothelial Cell Localization of Verotoxins by Immunofluorescence in the Rabbit Model of Verotoxemia. (355) M. BITZAN,\* M. WIEBE, T. MARTINO, C. HUANG, M. PETRIC, M. KARMALI, and S. RICHARDSON. Hosp. for Sick Children, Univ. of Toronto, Toronto, Ontario, Canada.
- B301.** Cloning, Expression, and Sequence Analysis of a Cytolytic Enterotoxin Gene from *Aeromonas hydrophila*. (357) A. K. CHOPRA,\* C. W. HOUSTON, J. W. PETERSON, and G. F. JIN. Dept. of Microbiol., Univ. of Texas Med. Branch, Galveston.
- B302.** Purification and Characterization of an Enterotoxin from *Bacteroides fragilis*. (359) R. L. VAN TASSELL,\* D. M. LYERLY, and T. D. WILKINS. Dept. of Anaerobic Microbiol., Virginia Polytechnic Inst. and State Univ., Blacksburg.
- B303.** Enterotoxin Production by "Pathogenic" and "Nonpathogenic" Strains of *Yersinia enterocolitica*. (361) J. G. MORRIS, JR.,\* T. TAKEDA, R. ROBINS-BROWNE, A.-M. BORDUN, S. DOHI, H. KASUGA, and A. FASANO. Univ. of Maryland Sch. of Med., Baltimore; Nat. Children's Med. Res. Ctr., Tokyo, Japan; Univ. of Melbourne, Melbourne, Australia; and Univ. of Catanzaro, Catanzaro.
- B304.** Expression of a Recombinant Peptide Containing the Receptor Binding Portion of Toxin A of *Clostridium difficile* Using the Baculovirus System. (363) P. E. HAHN,\* C. J. PHELPS, and L. A. BARROSO. Dept. of Anaerobic Microbiol., Virginia Polytechnic Inst. and State Univ., Blacksburg.
- B305.** Selective Cytotoxicity of *Clostridium difficile* Enterotoxin for Human Colon Carcinoma Cells. (365) V. KUSHNAROV,\* P. REDLICH, J. SEDMAK, and S. GROSSBERG. Med. Col. of Wisconsin, Milwaukee.
- B306.** Comparison of Toxin A and B Immunoglobulin G Antibody Development in Patients with *Clostridium difficile* Disease. (367) B. SCHNEIDER,\* P. CURTIN, S. MCGRATH, and A. BACON. Med. Ctr. of Delaware, Wilmington.
- B307.** Purification of *Clostridium difficile* Toxin A Receptor from Hamster Intestinal Brush Border Membranes. (369) R. D. ROLFE\* and W. SONG. Dept. of Microbiol., Texas Tech Univ. Health Sci. Ctr., Lubbock.
- B308.** Inhibition by Phospholipase A<sub>2</sub> Inhibitors of the Effects of *Clostridium difficile* Toxin A on Intestinal Secretion and Cytoskeleton of T-84 Cell Monolayers. (371) G. D. FANG,\* A. M. LIMA, R. B. ADAMS, D. M. LYERLY, and R. L. GUERRANT. Univ. of Virginia, Charlottesville; Virginia Polytechnic Inst. and State Univ., Blacksburg; and Fed. Univ. of Ceara, Fortaleza, CE, Brazil.
- B309.** Evidence that a Region of *Clostridium perfringens* Enterotoxin Remains on the Surface of Intestinal Brush Border Membranes after "Insertion." (373) J. F. KOKAI-KUN\* and B. A. MCCLANE. Univ. of Pittsburgh Sch. of Med., Pittsburgh, Pa.
- B310.** Cloning the Type A Enterotoxin of *Clostridium perfringens*. (375) J. R. CZECZULIN\* and B. A. MCCLANE. Univ. of Pittsburgh, Sch. of Med., Pittsburgh, Pa.
- B311.** Identification of Epitopes of Staphylococcal Enterotoxin B Involved in Binding to Major Histocompatibility Complex Class II Molecules. (377) C. BRIGGS,\* J. L. GABRIEL, and T. J. ROGERS. Temple Univ. Sch. of Med., Philadelphia, Pa.
- B312.** Monkeys Immunized with Microspheres That Contain Toxin of Staphylococcal Enterotoxin B: Immunity and Cellular Reactivity to Aerosolized Native Toxin. (379) J. TSENG,\* J. KOMISAR, R. HUNT, A. JOHNSON, L. PITT, and D. RUBLE. Walter Reed Army Inst. of Res., Washington, D.C., and US Army Med. Res. Inst. of Infectious Disease, Ft. Detrick, Md.
- B313.** Staphylococcal Enterotoxin B-Stimulated Arachidonate Metabolism in Human Kidney Proximal Tubule Cells. (381) M. JETT,\* V. LANCASTER, P. GEMSKI, T. BOYLE, and S. CHATTERJEE. Div. of Pathology, Walter Reed Army Inst. of Res., Washington, D.C., and Dept. of Pediatrics, Johns Hopkins Univ., Baltimore, Md.
- B314.** Molecular Heterogeneity of Type C Staphylococcal Enterotoxins from Human and Animal Sources. (383) J. D. LYON,\* H. PARK, J. ROBERSON, W. C. DAVIS, and G. A. BOHACH. Univ. of Idaho, Moscow, and Washington State Univ., Pullman.
- B315.** Toxigenic *Vibrio cholerae* O1 on Vero and CHO Cells from Mexican Strains. (385) G. RODRIGUEZ,\* S. GIONO, L. GUTIERREZ, and J. L. VALDESPINO. Nat. Inst. of Epidemic Dignosis and Reference, Health Secretary, Mexico, D.F., and ENCB-IPN, Mexico, D.F.

## POSTER SESSIONS

Saturday, 10:30-Noon, Exhibit Hall C

(Board numbers in parentheses)

### Session 282 (Q). APPLICATIONS OF BIOLUMINESCENT REPORTER GENES AND POLYMERASE CHAIN REACTION IN ENVIRONMENTAL MICROBIOLOGY

- Q317.** Construction of a Bioluminescent Reporter Plasmid To Monitor Environmental Parameters Which Induce Alginate Biosynthesis. (002) W. H. WALLACE\* and G. S. SAYLER.



Ctr. for Environmental Biotechnology, Univ. of Tennessee, Knoxville.

- Q318.** Effect of Iron on Light Output from a *xyl-lux* Bioluminescent Reporter Strain, RB1401. (004) C-T. KUO,\* O. WEBB, R. BURLAGE, and A. PALUMBO. Univ. of Tennessee, Knoxville, and Environmental Sciences Div., Oak Ridge Nat. Lab., Oak Ridge, Tenn.
- Q319.** Specific and Quantitative Assessment of Naphthalene and Salicylate Bioavailability Using a Bioluminescent Catabolic Reporter Bacterium. (006) A. HEITZER,\* O. F. WEBB, and G. S. SAYLER. Ctr. for Environmental Biotechnology, Univ. of Tennessee, Knoxville.
- Q320.** Maintenance and Stability of *nah-lux* Bioluminescent Reporter Strains and Plasmids. (008) W. H. JOHNSTON\* and G. S. SAYLER. Dept. of Microbiol. and Ctr. for Environmental Biotechnology, Univ. of Tennessee, Knoxville.
- Q321.** Applications of Biodegradative Gene Probes in Monitoring Petrochemical Wastewater Treatment. (010) R. JERNIGAN,\* I. ROSARIO, B. M. APPLIGATE, J. SANSEVERINO, A. HEITZER, A. LAYTON, and B. MCFARLAND. Ctr. for Environmental Biotechnology, Univ. of Tennessee, Knoxville, and Chevron Res. Corp., Richmond, Calif.
- Q322.** Use of a Chemiluminescent-Labeled DNA Probe To Measure Bacterial Populations in Oil Field Brines. (012) D. GEVERTZ. Salk Inst. of Biotechnology/Industrial Associates, Inc., San Diego, Calif.
- Q323.** Luminescent Biosensors for Detection of Inorganic and Organic Mercury. (014) J. TAYLOR,\* S. FRACKMAN, K. M. LANGLEY, and R. A. ROSSON. Bio-Technical Resources, Manitowoc, Wis., and Ctr. for Great Lakes Studies, Univ. of Wisconsin, Milwaukee.
- Q324.** Amplification by Polymerase Chain Reaction of DNA Bound on Clay Minerals. (016) A. ALVAREZ,\* M. KHANNA, G. TORANZOS, and G. STOTZKY. Biology Dept., Univ. of Puerto Rico, San Juan, Puerto Rico, and Biol. Dept., NYU, New York, N.Y.
- Q325.** Rapid Method To Purify Bacterial DNA from Humic Substances for Polymerase Chain Reaction. (018) Y.-L. TSAI,\* C. J. PALMER, L. SANGERMANO, and B. OLSON. County Sanitation Districts of Orange County, Fountain Valley, Calif., and Univ. of California, Irvine.
- Q326.** Amplification of 16S rRNA Genes from Microbial Communities within Marine Sediments by the Polymerase Chain Reaction. (020) R. DEVEREUX and G. MUNDFROM.\* U.S. EPA and Technical Resources, Inc., Gulf Breeze, Fla.
- Q327.** Quantifying Polymerase Chain Reaction (PCR) Templates Using the Most-Probable-Number-PCR. (022) G. A. TORANZOS\* and A. J. ALVAREZ. Dept. of Biol., Univ. of Puerto Rico, Rio Piedras, Puerto Rico.
- Q328.** Quantitative Detection of Microorganisms by Polymerase Chain Reaction-Most Probable Number Method. (024) G. ENDO,\* T. KOSEKI, and E. OIKAWA. Tohoku-Gakuin Univ., Tagajyo, Japan.

### Session 283 (H). mRNA: STRUCTURE, TURNOVER, AND ANTISENSE

- H272.** Photo-Cross-Linking Analysis of NusA-*boxA* RNA Interactions. (026) J. REIDLING, S. DISSINGER, J. JOU, and M. HANNA.\* Univ. of Oklahoma, Norman.
- H273.** rRNA Synthesis in Yeast: Identification of a Putative RNA Polymerase I Terminator. (028) D. L. RIGGS. Univ. of Oklahoma, Norman.
- H274.** Characterization of the *Bacillus thuringiensis* subsp. *thompsoni* Crystal Protein Genes. (030) K. L. BROWN\* and H. R. WHITELEY. Univ. of Washington, Seattle.

- H275.** Function of the Intergenic Hairpin Loop between *lacZ* and *lacY* Genes in *Escherichia coli*. (032) C. KWAN,\* O. FATTAL, N. PATRON, and D. P. NIERLICH. Mt. St. Mary's Col. and UCLA, Los Angeles, Calif.
- H276.** Half-Life Determination of *btuB* mRNA Decay from *Escherichia coli*. (034) J. RUSHING\* and M. D. LUNDRI-GAN. Univ. of Mississippi Med. Ctr., Jackson.
- H277.** Transcription Terminator *tI* Stabilizes Bacteriophage  $\lambda$  *int* mRNA. (036) F. VELAZQUEZ,\* C. MONTANEZ, and G. GUARNEROS. Dept. de Genética y Biol. Molecular, Ctr. de Investigación y de Estudios Avanzados, Mexico City, Mexico.
- H278.** Segmental Stabilization of Transcripts from the *Zymomonas mobilis* *gap* Operon: Mutational Analysis. (038) G. BURCHHARDT,\* K. F. KESHAV, and L. O. INGRAM. Univ. of Florida, Gainesville.
- H279.** Search for Terminators of Transcription in the *virD* Region of the Ti Plasmid pTiA6 of *Agrobacterium tumefaciens*. (040) T. ALTON,\* P. HU, and D.-H. KIM. Western Illinois Univ., Macomb.
- H280.** Influence of *micF* on the Elaboration of OmpF in *rfa* Mutants of *Escherichia coli* K-12. (042) J. A. FRALICK\* and L. L. BURNS-KELIHER. Texas Tech Univ. Health Sci. Ctr., Lubbock, Tex.
- H281.** PR264 Antisense-Encoded Protein: a Factor Involved in Trans-Splicing of *c-myc* Proto-Oncogene mRNA Species? (044) B. PERBAL,\* M. VELLARD, A. SUREAU, J. SCRET, C. MARTINERIE, and J. CROCHET. Inst. Curie, Orsay Cedex, France, and Univ. Paris VII, Paris, France.
- H282.** A Region Downstream from *resA* Positively Regulates the Transcription of *resA* in *trans*. (046) D. SLEDJESKI\* and S. GOTTESMAN. Lab. of Molecular Biol., NIH, Bethesda, Md.
- H283.** Regulation of Cell Growth by Antisense RNAs against tRNAs in *Escherichia coli*. (048) G. CHEN, O. MIROCHNITCHENKO, and M. INOUE.\* Dept. of Biochemistry, Robert Wood Johnson Med. Sch.-Univ. of Med. and Dent. of New Jersey-Rutgers, Piscataway.

### Session 284 (C). EPIDEMIOLOGY OF BACTERIAL AND VIRAL AGENTS II

- C339.** Analysis of an Outbreak of Staphylococcal Food Poisoning among the Homeless in Austin, Texas. (050) S. S. BARTH,\* D. L. WHITE, K. HENDRICKS, K. JOST, JR., M. L. RUTTER, and A. L. WONG. Texas Dept. of Health, Austin, and Univ. of Wisconsin, Madison.
- C340.** A 3-Year Assessment of Methicillin-Resistant *Staphylococcus aureus* in a Burn Center. (052) K. E. BELCHER,\* D. BARNHART, E. LAW, and J. M. STILL. Humana Hosp.-Augusta Burn Ctr., Augusta, Ga.
- C341.** Survival of Methicillin-Resistant *Staphylococcus aureus* in the Environment. (054) S. M. SMITH, R. H. K. ENG,\* and F. T. PADBERG. VA Med. Ctr., East Orange, N.J., and New Jersey Med. Sch., Newark.
- C342.** *Staphylococcus aureus* on Earth and in Space. (056) M. CHIDAMBARAM, B. SHARMA, L. MALLARY, J. D. HEATH, D. L. PIERSON,\* S. K. MISHRA, and G. M. WEINSTOCK. Univ. of Texas Med. Sch., Houston Police Crime Lab., NASA/JSC, and Krug Life Sci., Houston.
- C343.** Polymorphism of IS861 in *Streptococcus agalactiae* as a Tool in Epidemiological Studies. (058) C. BOLLET,\* X. DE LAMBALLERIE, C. VIGNOLI, C. ZANDOTTI, and P. DE MICCO. Hôpital Salvator, Marseille, France.
- C344.** Group G Streptococcal Isolates: a 3-Year Experience. (060) J. FERNANDEZ, T. KHALIL, E. DORIGAN, R. WURTZ,\* and F. KOCKA. Cook County Hosp., Chicago, Ill.

- C345.** Epidemiological Distribution and Susceptibility Pattern of *Enterococcus* spp. (062) B. SARACHIAN\* and L. MIKAE-LIAN. British Hosp. and CEM, Buenos Aires, Argentina.
- C346.** Enterococci in Severe Human Periodontitis. (064) D. FEIK,\* T. E. RAMS, V. YOUNG, B. HAMMOND, and J. SLOTS. Med. Col. of Pennsylvania and Univ. of Pennsylvania, Philadelphia, and USC, Los Angeles, Calif.
- C347.** Microbial Interactions in Severe Human Periodontitis. (066) J. SLOTS\* and T. E. RAMS. USC, Los Angeles, Calif., and Univ. of Pennsylvania, Philadelphia.
- C348.** Continuous Ambulatory Peritoneal Dialysis Peritonitis: New Agents for a New Problem. (068) D. CROTTI,\* M. DEL SANTE, and G. FONZO. Dept. of Clin. Microbiol., R. Silvestrini Hosp., Perugia, Italy.
- C349.** Multiple Nursing Home Outbreak of Transferrable Cefazidime-Resistant *Enterobacteriaceae*. (070) J. WIENER,\* J. QUINN, M. KOWALCZYK, K. BUSH, B. RASMUSSEN, and R. A. WEINSTEIN. Humana Hosp.-Michael Reese, Chicago, Ill., and American Cyanamid, N.Y.
- C350.** The Unimportance of Duplicate Removal on Antibiotic Sensitivity Statistics. (072) K. WILLARD\* and L. PETERSON. VA Med. Ctr., Minneapolis, Minn.
- C351.** Clinical, Epidemiologic, and Microbiologic Findings of Cervicovaginal Infections in a Private Medical Center in Buenos Aires, Argentina. (074) J. SMAYEVSKY,\* C. BANTAR, H. BIANCHINI, G. WELTMAN, A. LANZA, M. PUNDIK, S. RELLOSO, and L. FERNANDEZ. Ctr. de Educación Méd. e Investigaciones Clín. and Lab. BioCiencia, Buenos Aires, Argentina.
- C352.** Resistance Trends in Bovine Respiratory Disease Isolates. (076) J. L. WATTS,\* R. J. YANCEY, JR., and C. A. CASE. Animal Health Therapeutics Res., Upjohn Co., Kalamazoo, Mich.
- C353.** Increased Levels of Specific Antibodies in Subjectively Healthy Carriers of *Chlamydia pneumoniae*. (078) H. GNARPE,\* J. GNARPE, B. SUNDELOF, and I. LUND OLSEN. Dept. of Clin. Microbiol. and Dept. of Infectious Diseases, Gävle Central Hosp., Gävle, Sweden, and Vallhov Health Care Ctr., Sandviken, Sweden.
- C354.** Culture of *Chlamydia pneumoniae* from Subjectively Healthy Individuals in Sweden. (080) J. GNARPE,\* B. SUNDELOF, A. LUNDBACK, and H. GNARPE. Dept. of Clin. Microbiol. and Dept. of Infectious Diseases, Gävle Central Hosp., Gävle, Sweden.
- C355.** Epidemiology of Epstein-Barr Virus Infections in Infants and Children from Bari Area (South Italy). (082) G. LEOGRANDE\* and E. JIRILLO. Inst. Microbiol., Univ. of Bari, Bari, Italy.
- C356.** Subtypes of Hepatitis B Surface Antigen in Korea: High Frequency of Unusual Subtypes and Comparison with Other Asian Nations. (084) Y. W. KIM,\* M. K. CHO, C. H. MIN, and I. H. CHU. Col. of Med., Hallym Univ., Chooncheon, Korea.
- C357.** Community-Wide Surveillance for Influenza in Nursing Homes: Experience during an Influenza A and Influenza B Season. (086) M. A. MENEGUS,\* W. H. BARKER, D. W. BENTLEY, C. B. FREUNDLICH, C. M. MAYER, and K. C. LEIBENGUTH. Univ. of Rochester Med. Ctr., Rochester, N.Y.
- C358.** Possible Nonsexual Transmission of Genital Human Papillomavirus Infections in Young Women. (088) C. C. PAO,\* P. L. TSAI, and J. Y. JIN. Chang Gung Med. Col., Taipei, Taiwan, and Beijing Friendship Hosp., Beijing, China.
- C359.** Epidemiological Investigation of *Trichomonas vaginalis* in San Jose, Costa Rica. (090) K. A. BORCHARDT,\* S. MILLER, and N. MAIDA. Ctr. for Advanced Med. Technology, San Francisco State Univ., San Francisco, Calif., and Womens Health Associates, Greenbrae, Calif.

## Session 285 (C). ANAEROBES: ISOLATION, TOXIN DETECTION, IDENTIFICATION, AND ANTIBIOTIC SUSCEPTIBILITY TESTING

- C360.** Comparison of Recovery of Anaerobic Bacteria Using the Anoxomat, Anaerobic Chamber, and GasPak Jar Systems. (092) C. STRONG,\* M. MCTEAGUE, P. SUMMANEN, and E. BARON. Wadsworth VA Med. Ctr. and Dept. of Med., UCLA, Los Angeles, Calif.
- C361.** Comparison of Two Methods for the Identification of Anaerobic Bacteria. (094) A. MAHON,\* M. YOCUM, R. MCAFEE, and J. ALVEY. Johns Hopkins Hosp., Baltimore, Md.
- C362.** Identification of Anaerobic Bacteria by the MIDI Microbial Identification System. (096) D. GUSTAFSON,\* R. JOHNSON, and J. ROSENBLATT. Mayo Clin., Rochester, Minn.
- C363.** Comparison of Methods for Species Identification of the *Bacteroides fragilis* Group. (098) A.-M. BOURGAULT, F. LAMOTHE,\* and H. GILBERT. Hôpital St-Luc and Univ. de Montréal, Montreal, Quebec, Canada.
- C364.** Reproducibility of the NCCLS Reference Agar Dilution Method: Problems with Cefprozime and *Bacteroides fragilis* ATCC 25285. (100) A. M. BOURGAULT, F. LAMOTHE,\* G. H. K. HARDING, D. HOBAN, and H. GILBERT. Hôpital St-Luc, Montreal, Quebec, Canada, and Health Sci. Ctr. and St-Boniface Gen. Hosp., Winnipeg, Manitoba, Canada.
- C365.** Evaluation of the E Test for Anaerobic Susceptibility Testing (102) J. NGUI-YEN,\* K. CHOO, C. NIXON, E. A. BRYCE, and J. A. SMITH. Vancouver Gen. Hosp., Vancouver, British Columbia, Canada.
- C366.** Oxyrase-Supplemented Media for Broth Dilution MIC Testing of Anaerobes. (104) K. PRATT\* and G. HALL. Cleveland Clin. Fndn., Cleveland, Ohio.
- C367.** Anaerobe Susceptibility Pattern in Saskatchewan. (106) E. CHAN,\* A. LIN, and G. HORSMAN. Provincial Lab. and Plains Health Ctr., Regina, Saskatchewan, Canada.
- C368.** Microbroth versus Agar Dilution for Susceptibility Testing of Terafloxacin and Five Other Antibiotics against 212 Anaerobic Bacteria. (108) C. J. KREPEL,\* C. M. GOHR, C. E. EDMISTON, and R. E. CONDON. Dept. of Surgery, Med. Col. of Wisconsin, Milwaukee.
- C369.** In Vitro Susceptibility of Obligate Anaerobes to Terafloxacin HCl. (110) A. MANGANIELLO-DUBOIS,\* M. DELANEY, and A. ONDERDONK. Brigham & Women's Hosp., Harvard Med. Sch., Boston, Mass.
- C370.** Effect of In Vitro Testing Methods on Activity of Terafloxacin and Ciprofloxacin against Anaerobes. (112) D. HENSEY, S. K. TANAKA,\* and J. CLEMENT. Abbott Lab., Abbott Park, Ill.
- C371.** Anaerobic Susceptibility Testing: Slight Differences in Inoculum Size Can Make a Difference in MIC Values. (114) D. D. SCHIRO\* and K. E. ALDRIDGE. Louisiana State Univ. Med. Ctr., New Orleans.
- C372.** Fecal Leukocytes in *Clostridium difficile*-Associated Diarrhea. (116) C. E. MARX,\* M. L. WILSON, and A. J. MORRIS. Duke Univ. Med. Ctr., Durham, N.C.
- C373.** Simplified Technique for Detecting *Clostridium difficile* in Stool Samples by Polymerase Chain Reaction. (118) G. KILLGORE,\* L. WIGGS, N. KATO, T. MINNICK, and O. POWELL. CDC, Atlanta, Ga.; Gifu Univ. Sch. Med., Gifu, Japan; and Sarasota Mem. Hosp., Sarasota, Fla.
- C374.** Use of a Selective Enrichment Broth for the Detection of Toxigenic *Clostridium difficile* in Feces. (120) R. J. CARMAN,\* D. T. EVANS, and J. H. BOONE. TechLab, Inc., Blacksburg, Va.

- C375.** Evaluation of *Clostridium difficile* Cytotoxin and Fecal Lactoferrin Assays in Nosocomial Diarrhea (122) L. J. BARRETT,\* E. SILVA, D. HIRSH, J. SARAZIN, C. MAKI, D. GROSCHEL, and R. L. GUERRANT. Univ. of Virginia Health Sci. Ctr., Charlottesville
- C376.** Rapid Enzyme Immunoassay for Detection of the Latex Reactive Protein of *Clostridium difficile*. (124) J. KRAFI,\* R. ROGERS, and D. WILLIS. Meridian Diagnostics, Inc., Cincinnati, Ohio
- C377.** Is There a Preferred Method To Detect *Clostridium difficile*-Associated Colitis? (126) D. E. ANDERSON,\* M. B. BAKER, D. CAMPBELL, R. J. CARMAN, J. CLARIDGE, E. ELLINGSEN, D. EVANS, J. KRAMP, and G. PAVEY. Sacred Heart Med. Ctr., Pathology Associates Med. Lab., Deaconess Med. Ctr., and Rockwood Clin., Spokane, Wash., and TechLab, Blacksburg, Va
- C378.** Stability of *Clostridium difficile* Cytotoxic Activity (128) L. WETTERAU\* and M. GEORGE. Stratton VA Med. Ctr., Albany, N.Y.
- C379.** Amplified Flow Cytometric Fluoroimmunoassay for *Clostridium difficile* Toxin A. (130) E. D. RENNER. VA Med. Ctr. and Univ. of North Dakota, Fargo

### Session 286 (B). IMMUNE RESPONSE TO PATHOGENIC MICROORGANISMS: ANIMAL MODELS OF INFECTION

- B316.** Modulation of Immunity in Non-O1 *Vibrio cholerae*. (132) P. PANIGRAHI,\* S. SRINIVAS, J. A. JOHNSON, and L. J. DETOLLA. Univ. of Maryland Sch. of Med., Baltimore
- B317.** Expression in *Pseudomonas aeruginosa* of a 66-kDa Protein Inducing Immune Response in Resistant Patients with Cystic Fibrosis. (134) E. LIKAVCANOVA\* and J. LAGACE. Univ. of Montreal, Montreal, Quebec, Canada
- B318.** Immunological Characterization of the Protective Antigens of Serotypes 1 and 2 of *Serpula hyodysenteriae*. (136) S. MARTIN,\* M. J. KENNEDY, R. A. RZEPKOWSKI, and R. J. YANCEY, JR. Upjohn Co., Kalamazoo, Mich
- B319.** Heat-Stable Serum Opsonic Activity to *Pseudomonas aeruginosa* in Cystic Fibrosis. (138) T. PRESSLER,\* E. T. JENSEN, F. ESPERSEN, S. S. PEDERSEN, N. HOIBY, and C. KOCH. Dept. of Clin. Microbiol. and Dept. of Pediatrics, Rigshospitalet, Copenhagen, Denmark
- B320.** Antibodies from Chronically Infected Cystic Fibrosis Patients React with Lipopolysaccharides from All Serotypes of *Pseudomonas aeruginosa*. (140) A. FOMSGAARD,\* G. H. SHAND, M. A. FREUDENBERG, C. GALANOS, G. KRONBORG, and N. HOIBY. Dept. of Clin. Microbiol., Rigshospitalet, Copenhagen, Denmark, and Max-Planck Inst. fur Immunbiol., Freiburg, Germany
- B321.** Anti-*Pseudomonas aeruginosa* Lipid A Antibodies in Chronically Infected Cystic Fibrosis Patients. (142) G. KRONBORG,\* A. FOMSGAARD, C. GALANOS, M. A. FREUDENBERG, and H. HOIBY. Dept. of Clin. Microbiol. and Danish CF Ctr., Rigshospitalet, Copenhagen, Denmark, and Max-Planck Inst. fur Immunbiologie, Freiburg, Germany
- B322.** Serum Immunoglobulin A for Differentiating *Clostridium difficile* Carriers from Symptomatic Patients. (144) S. MILLER, M. MULLIGAN,\* I. MCFARLAND, and H. FUNG. VA Med. Ctr. and California State Univ., Long Beach, Univ. of California, Irvine, and Univ. of Washington, Seattle
- B323.** Long-Lived Antibody to Filamentous Hemagglutinin following *Bordetella pertussis* Infection. (146) D. F. AMSHAUGH,\* C. R. MANCLARK, and R. D. SHAHIN. Ctr. for Biologics Evaluation and Res., FDA, Bethesda, Md
- B324.** Presence of Bacterial-Specific Immunoglobulin A (IgA) and IgG in Prostatic Fluid Is Not Protective against Acute Bacterial Prostatitis in a Rat Model. (148) H. CERE,\* S. SCHMIDT, H. BENEDIKSSON, J. NICKLE, and M. OLSON. Univ. of Calgary, Calgary, Alberta, Canada
- B325.** Immune Enhancement of Pulmonary Clearance of *Moraxella catarrhalis*. (150) I. MACIVER,\* M. UNHA-NAND, M. HELMINEN, G. H. MCCracken, JR., and E. J. HANSEN. Univ. of Texas Southwestern Med. Ctr., Dallas
- B326.** Proteolytic Activity and Susceptibility to Lethal Infection. (152) A. N. NEELY\* and I. A. HOLDER. Stammers Burns Inst., Cincinnati, Ohio
- B327.** Aerosolization Model of *Francisella tularensis*. (154) W. JONAS,\* A. FORHER, and C. NACY. Walter Reed Army Inst. of Res., Washington, DC
- B328.** Comparison of Virulence among Serotypes of *Cryptococcus neoformans* in a Murine Inhalation Model. (156) D. CHURCH\* and R. WASHBURN. Bowman Gray Sch. of Med., Winston-Salem, N.C.
- B329.** Induction of Urinary Tract Infection in Mice by Urethral Inoculation with *Escherichia coli*. (158) J. A. HALL,\* W. J. HOPKINS, E. BALISH, and D. T. UHILING. Univ. of Wisconsin Med. Sch., Madison
- B330.** Catheter Infection in Chronically Instrumented Peritoneal Peritonitis Model. (160) D. ROLLINS,\* K. KAZARIAN, W. LYNCH, P. PERDUE, A. DZIKI, T. WILLIAMS, and W. LAW. Naval Med. Res. Inst., Bethesda, Md
- B331.** Simplification of the Adult Rabbit Model for Assessment of Protective Immunity against *Campylobacter* Infections. (162) O. R. PAVLOVSKIS,\* D. M. ROLLINS, and R. T. WALKER. Naval Med. Res. Inst., Bethesda, Md
- B332.** Experimental Infections in Mice Caused by Isogenic *Klebsiella pneumoniae* O1:K2 Harboring or Not Harboring a Plasmid Encoding Virulence Factors, Aerobactin and Mucoid Phenotype. (164) V. VERNET,\* C. MADOULET, M. PATEY, R. JAUSSAUD, O. BAJOLET, C. CHIPPAUX, and A. PHILIPPON. Univ. of Med., Reims, France, and Saint-Louis Hosp., Paris, France
- B333.** Evaluation of Antibacterial Agents in Mice Infected Aerogenically with *Pasteurella multocida*. (166) B. J. KAMICKER. Central Res. Div., Pfizer Inc., Terre Haute, Ind
- B334.** The Sheepshead Minnow, *Cyprinodon variegatus*, as a Model for Virulence Studies in *Aeromonas* Species. (168) S. R. ZYWNO,\* B. R. BYERS, and A. M. GUARINO. Office of Seafood, U.S. FDA, Dauphin Island, Ala., and Univ. of Mississippi Med. Ctr., Jackson
- B335.** Use of the Immunomodulator *Ecteinascidia turbinata* Extract in Association with *Edwardsiella ictaluri* Infections of Channel Catfish. (170) I. A. STANLEY,\* M. I. BERRY, I. E. SCHWEDLER, and S. S. HAYASAKA. Clemson Univ., Clemson, SC
- B336.** Virulence Assay for *Haemophilus ducreyi* Rabbit Infection. Effect of Iron Loading and Immunization on Disease. (172) M. MELOCHE,\* C. L. THOMPSON, and D. W. CAMERON. Dept. of Microbiol. and Immunology, Univ. of Ottawa, Ottawa, Ontario, Canada
- B337.** Virulence Studies of *Bacillus anthracis* Congo Red Mutants. (174) P. L. WORSHAM,\* B. E. IVINS, and M. R. SOWERS. U.S. Army Med. Res. Inst. of Infectious Diseases, Fort Detrick, Frederick, Md
- B338.** Induction of Blood-Brain Barrier Permeability by Antibodies to Filamentous Hemagglutinin of *Bordetella pertussis*. (176) S. PRASAD,\* P. IBSEN, I. HERON, M. BURROUGHS, S. GEELEN, and E. TUOMANEN. Rockefeller Univ., New York, N.Y., and Statens Serum Institut, Copenhagen, Denmark
- B339.** *Candida albicans* Infection in CD4- and CD8-Depleted Mice. (178) I. ROMANI, A. MUNCACCI, P. MOSCI, I.

CENCI, and F. BISTONI.\* Dept. of Exp. Med., Univ. of Perugia, Perugia, Italy.

**B340.** Temporal Monitoring of Mice for Endotoxin-Induced Disseminated Intravascular Coagulation Yields Similar Results by Tail Clip or Cardiac Puncture Methods of Blood Collection. (180) D. GREGG,\* J. BUKOVICH, and E. CARLSON. Michigan Technological Univ., Houghton.

### Session 287 (B). HOST FACTORS IN INFECTION: SPECIFIC AND NONSPECIFIC DEFENSES

**B341.** Host Cell Actin Provides the Propulsive Force for the Intracellular Movement of *Listeria monocytogenes*. (182) F. S. SOUTHWICK,\* J. M. SANGER, and J. W. SANGER. Univ. of Florida, Gainesville, and Univ. of Pennsylvania, Philadelphia.

**B342.** Interaction of Opaque and Translucent Variants of *Vibrio vulnificus* with Peritoneal Exudate Cells. (184) L. M. SIMPSON,\* J. C. TRAVIS, and J. D. OLIVER. Univ. of North Carolina, Charlotte.

**B343.** Depletion of CD4<sup>+</sup> and/or CD8<sup>+</sup> T Cells Promotes Bacterial Translocation from the Intestines. (186) M. GAUTREAU\* and R. BERG. Louisiana State Univ. Med. Ctr., Shreveport.

**B344.** Cytokine Expression of HEp-2 Cells, U-937 Cells, and Neutrophils in Cellular Coincubation Experiments with Intracellular Bacteria (*Listeria* spp., *Yersinia* spp.). (188) R. ARNOLD, J. SCHEFFER, and W. KONIG.\* Med. Mikrobiologie und Immunologie, AG Infektabwehr, Ruhr Univ. Bochum, Bochum, Germany.

**B345.** Migration of Polymorphonuclear Leukocytes to *Pseudomonas aeruginosa* Chemotactins: Priming by Interleukin-1 $\beta$  and Inhibition by Piroxicam. (190) P. A. FONTAN, C. R. AMURA, and D. O. SORDELLI.\* Univ. of Buenos Aires, Buenos Aires, Argentina.

**B346.** Type 1 Fimbriae Protect *Escherichia coli* from Bactericidal Activity of Human Polymorphonuclear Leukocytes. (192) J. MACGREGOR,\* T. IKEDA, R. J. LITTLE, R. TEWARI, L. HIMPEL, and S. N. ABRAHAM. Washington Univ. Sch. of Med., St. Louis, Mo.

**B347.** Arachidonic Metabolites in Acute Pyelonephritis. (194) J. A. ROBERTS,\* B. KAACK, and D. B. MCNAMARA. Tulane Regional Primate Res. Ctr., Covington, La.

**B348.** *Haemophilus influenzae* b Meningitis: Advantage of Treatments with Amikacin To Reduce the Lipooligosaccharide Biological Activities. (196) V. GOURY, H. BENNANI, A. TIBI, O. BAILLON, E. BINGEN, and J. C. DARBORD.\* Robert Debré Hosp. and Paris V Univ., Paris, France.

**B349.** N-Acetylmuramyl-L-Alanyl-D-Isoglutamine Potentiates Production of Interleukin-1 in P388D1 Macrophages. (198) D. MORGENSTERN,\* B. S. KWON, and R. S. ROSENTHAL. Indiana Univ. Sch. of Med., Indianapolis.

**B350.** Activation of Alveolar Macrophages for Anti-*Francisella* Effector Functions. (200) T. POLSINELLI,\* A. H. FORTIER, and C. A. NACY. Walter Reed Army Inst. of Res., Washington, D.C.

**B351.** Effect of Short-Chain Fatty Acids on Procoagulant Production by Leukocytes. (202) G. MIRAGLIOTTA,\* G. BOTTA, A. ARZESE, A. MOSCA, and R. DEL PRETE. Inst. of Microbiol., Univ. of Bari, Bari, Italy, and Univ. of Udine, Udine, Italy.

**B352.** Inhibition of Blood Clearance of *Klebsiella pneumoniae* in Mice by Capsular Polysaccharides Specific for a Macrophage Lectin. (204) A. ATHAMNA, N. SHARON, G. G. S. DUTTON, and I. OFEK.\* Tel Aviv Univ., Tel Aviv, Israel;

Weizmann Inst. of Sci., Rehovot, Israel, and Univ. of British Columbia, Vancouver, British Columbia, Canada

**B353.** Cytotoxicity of *Legionella pneumophila* for Mononuclear Phagocytes. (206) L. HUSMANN\* and W. JOHNSON. Univ. of Iowa, Iowa City.

**B354.** Increased Endotoxin Lethality and Decreased Serum Tumor Necrosis Factor Alpha Levels in Mice by Pertussis Toxin. (208) F. VOGEL,\* T. GIAMPAGLIA, and J. SCOTT. Lederle-Praxis Biologicals, Pearl River, N.Y.

**B355.** Gamma Interferon Levels in Serum and Bronchoalveolar Lavage Fluid of Mice Infected with *Bordetella pertussis*. (210) D. TORRE,\* A. PUGLIESE, R. TAMBINI, L. PERVERSI, P. MARONE, and F. SPERANZA. Div. of Infectious Diseases, Varese, Italy; Inst. of Infectious Diseases, Turin, Italy; and Inst. of Infectious Diseases, Pavia, Italy.

**B356.** *Propionibacterium acnes* Priming of Mice for Lipooligosaccharide Hypersensitivity Is Reversed by Monophosphoryl Lipid A Treatment. (212) J. R. WARD,\* Y. M. HUDSON, and J. T. ULRICH. Ribi Immunochem Res., Inc., Hamilton, Mont.

**B357.** Risk of Lethal Infection with *Escherichia coli* K1 in Autoimmune Mice Correlates with Defects in Polymorphonuclear Leukocyte Function. (214) J. LOWRANCE,\* H. GRESHAM, and F. O'SULLIVAN. VA Med. Ctr. and Univ. of Missouri, Columbia.

**B358.** Molecular Characterization of cDNAs Encoding Four Rat Neutrophil Defensins. (216) N. Y. YOUNT\* and M. E. SELSTED. Dept. of Pathology, Col. of Med., Univ. of California, Irvine.

**B359.** Purification and Characterization of Two Murine Intestinal Defensins, Cryptdin 1 and Cryptdin 2. (218) P. B. EISENHAUER,\* S. S. L. HARWIG, and R. I. LEHRER. UCLA, Los Angeles, Calif.

**B360.** Bacteriostatic Activity of Bile Salts in Relation to Hydrophobicity of the Molecule and Micelle Formation with Phospholipid. (220) J. Y. SUNG,\* K. LAM, M. RESEK, and E. A. SHAFFER. Univ. of Calgary, Calgary, Alberta, Canada, and Chinese Univ. of Hong Kong, Hong Kong.

**B361.** Acute Pancreatitis Enhances the Lethal Effects of Endotoxin. (222) M. REILLY,\* D. MEDICH, and W. SCHRAUT. Univ. of Pittsburgh, Pittsburgh, Pa.

**B362.** Effect of Chronic Fasting on Recrudescence of an Intestinal Infection by *Salmonella enteritidis* in Chickens. (224) P. HOLT\* and R. PORTER, JR. USDA, Agricultural Res. Service, Southeast Poultry Res. Lab., Athens, Ga.

**B363.** Fasting Increases the Severity of Intestinal Lesions Caused by *Salmonella enteritidis* in Adult Chickens. (225) R. PORTER, JR.,\* and P. HOLT. USDA, Agricultural Res. Service, Southeast Poultry Res. Lab., Athens, Ga.

**B364.** Peptidoglycan Fragments Suppress Appetite In Rats (228) K. J. BIBERSTINE\* and R. S. ROSENTHAL. Indiana Univ. Sch. of Med., Indianapolis.

**B365.** Effect of Weight, Acclimation Time, and Strain of Mice on Their Susceptibility to Respiratory Infection with *Pasteurella multocida*. (230) F. H. WEBER. Central Res. Div., Pfizer, Inc., Terre Haute, Ind.

**B366.** Selective Decontamination of the Digestive Tract and Colonization Resistance in Mice. (232) A. S. AMEEN,\* A. B. J. SPEEKENBRINK, and S. R. ALCOCK. Univ. Dept. of Bacteriol., Western Infirmary, Glasgow, United Kingdom.

**B367.** Calprotectin: a Novel Anticandidal Host Defense (234) A. R. MURTHY,\* K. T. MIYASAKI, and R. I. LEHRER. VA Med. Ctr., Sepulveda, Calif., and UCLA, Los Angeles, Calif.

**B368.** *Helicobacter pylori* Lipopolysaccharide from Asymptomatic and Duodenal Ulcer Patients Evokes Different Degrees of Stimulation of Pepsinogen Release. (236) A. IASTOVICA,\* G. O. YOUNG, N. STEMMET, J. A. LOUW, and J. N.

**GENE TRANSFER IN THE ENVIRONMENT**

Saturday, 1:30 P.M., Room 12

*Moderators:* ROBERT V. MILLER, Oklahoma State Univ., Stillwater, and MICHAEL A. GEALT, Drexel Univ., Philadelphia, Pa.

1:30

- Q329. Evidence for Gene Transfer among *Pseudomonas* Mediated through Phages on Plant Leaf Surfaces. S. P. KIDAMBI,\* S. RIPP, and R. V. MILLER. Oklahoma State Univ., Stillwater.
- Q330. Natural Plasmid Transformation in a High-Frequency-of-Transformation Marine *Vibrio*: Variables Affecting Competency. M. E. FRISCHER,\* J. M. THURMOND, and J. H. PAUL. Dept. of Marine Sci., Univ. of South Florida, St. Petersburg.
- Q331. Horizontal Gene Transfer in Aquatic Microcosm. W.-L. CHAO,\* B.-W. WANG, and H.-C. WONG. Dept. of Microbiol., Soochow Univ., Taipei, Taiwan, Republic of China
- Q332. Drug Resistance Transfer of the Bacteria Associated with Marine Aquacultural Animals. C. H. HSU. Nat. Sun Yat-sen Univ., Kaohsiung, Taiwan, Republic of China.

2:30

- Q333. The Effect of Divalent Cations on the Binding of DNA to Marine Sediments and on the Frequency of Natural Transformation in *Pseudomonas stutzeri* ZoBell. K. GARKO,\* D. WINGFIELD, and G. STEWART. Dept. of Biol., Univ. of South Florida, Tampa.
- Q334. Effect of Ferric Ion on Expression of the *traJ* Gene of the Conjugative Plasmid R100-1. S. SELVARATNAM,\* T. KHALIL, and M. A. GEALT. Dept. of Biosci. and Biotechnology, Drexel Univ., Philadelphia, Pa.
- Q335. Gene Transfer from Genetically Engineered Microorganisms to Aquatic Microbial Communities Detected by Assembly of a Catabolic Pathway. T. BARKAY,\* M. GILLMAN, and C. LIEBERT. U.S. EPA and Technology Resources Inc., Sabine Island, Gulf Breeze, Fla.
- Q336. Survival of Freeze-Dried Genetically Engineered Microorganisms in Air and the Effect of Visible Light. E. ISRAELI,\* B. T. SHAFFER, J. A. HOYT, B. LIGHTHART, and L. M. GANIO. U.S. EPA and ManTech Environmental, Environmental Res. Lab., Corvallis, Ore.

3:30

- Q337. Survival, Gene Transfer, and Leaching of a Genetically Engineered *Pseudomonas aeruginosa* in an Undisturbed Soil Column. K. W. LOVINS,\* J. S. ANGLE, J. REDSON, and R. L. HILL. Univ. of Maryland, College Park
- Q338. Gene Transfer in Soil: Indigenous Recipients of Plasmid R68.45. J. G. GLEW, J. S. ANGLE,\* and M. J. SADOWSKY. Univ. of Maryland, College Park, and Univ. of Minnesota, St. Paul.
- Q339. Transfer of the IncP Plasmids pJP4 and r68.45 between Bradyrhizobia Populations in Natural Soil. B. K. KINKLE,\* E. L. SCHMIDT, M. J. SADOWSKY, and W. C. KOSKINEN. USDA, Agricultural Res. Service, and Soil Sci. Dept., Univ. of Minnesota, St. Paul.

MARKS. Dept. of Microbiol., Red Cross Hosp., and Gastrointestinal Clin., Dept. of Med., Univ. of Cape Town and Groote Shuur Hosp., Cape Town, South Africa.

B369. Progressive Tissue Necrosis and the Effects of Aloe. (238) J. P. HEGGERS,\* R. P. PELLE, D. P. HILL, J. STABERNAU, and W. WINTERS. Shriners Burns Inst. and Univ. of Texas Med. Branch, Galveston, and Univ. of Texas Health Sci. Ctr., San Antonio.

B370. Cytokine Production in Experimental Group B Streptococcal Infections. (240) G. TETI,\* G. MANCUSO, and F. TOMASELLO. Istituto di Microbiol., Facolta di Med., Univ. di Messina, Messina, Italy.

**Session 288 (BET, R). Seminar**  
(Eligible for continuing education credit)

**UPDATE '92 III**

Saturday, Noon, Room 13

*Convenors:* PAUL TABOR, Clarke Col., Dubuque, Iowa, and JOHN M. LAMMERT, Gustavus Adolphus Col., St. Peter, Minn.

Update '92 in Microbial Diversity  
DAVID A. STAHL, Univ. of Illinois, Urbana

**Session 289 (Q, K, H). Seminar**  
(Eligible for continuing education credit)

**MICROBIAL METAL-BINDING PEPTIDES:  
GENE REGULATION AND FUNCTION**

Saturday, 1:30 P.M., Room 10

*Convenors:* MICHAEL RHODES and SIMON SILVER, Univ. of Illinois Col. of Med., Chicago

*Saccharomyces cerevisiae* Metallothionein: Regulation and Synthesis  
DEAN H. HAMER, NIH, Bethesda, Md.

Cyanobacterial *Synechococcus* Metallothionein: Molecular Biology  
NIGEL J. ROBINSON, Univ. of Durham, Durham, U.K.

Cyanobacterial and Other Prokaryotic Metallothioneins  
SUSAN RHODES, Univ. of Illinois, Chicago

*Schizosaccharomyces pombe* Phytochelatins: Polyglutathione-like Metal Binding Peptides  
DENNIS R. WINGE, Univ. of Utah Med. Ctr., Salt Lake City

Phytochelatin Synthesis and Metal Tolerance in Plants  
PETER B. GOLDSBROUGH, Purdue Univ., W. Lafayette, Ind

**Session 291 (H). Seminar**  
(Eligible for continuing education credit)

**EXTRACELLULAR DESTINY OF GRAM-  
NEGATIVE POLYPEPTIDES**

Saturday, 1:30 P.M., Room 43

Convenors: YANKEL M. KUPERSZTOCH, Univ. of Texas Southwestern Med. Ctr., Dallas, and RODNEY WELCH, Univ. of Wisconsin, Madison

Extracellular Enterotoxins: Secretory Pathway of the Heat-Stable Enterotoxins  
YANKEL M. KUPERSZTOCH, Univ. of Texas Southwestern Med. Ctr., Dallas

Secretion of Hemolysins  
RODNEY A. WELCH, Univ. of Wisconsin, Madison

Export of Killer Peptides  
ROBERTO KOLTER, Harvard Med. Sch., Boston, Mass.

Mechanism of Secretion of Immunoglobulin A Protease  
ANDREW WRIGHT, Tufts Med. Sch., Boston, Mass.

Passing through the Periplasm? Protein Secretion by *Vibrio* sp.  
THOMAS BUCKLEY, Univ. of Victoria, Victoria, British Columbia, Canada

**Session 292 (I). Seminar**  
(Eligible for continuing education credit)

**CAIRNSIAN MUTATIONS: A SPECIFIC  
RESPONSE TO STRESS?**

Saturday, 1:30 P.M., Room 39

Convenors: ANNE MORRIS HOOKE, Miami Univ., Oxford, Ohio, and MICHAEL MALAVASIC, Georgetown Univ. Med. Sch., Washington, D.C.

Directed Mutations: Facts and Theories  
PATRICIA L. FOSTER, Boston Univ. Sch. of Publ. Health, Boston, Mass.

Estimating the Degree to Which Selection-Induced Mutations Are Specific to the Environmental Challenge Applied  
BARRY HALL, Univ. of Rochester, Rochester, N.Y.

Cairnsian Mutations in Yeast: Mechanisms?  
SUE JINKS-ROBERTSON, Emory Univ., Atlanta, Ga

"Pseudorevertants" of Temperature-Sensitive *Salmonella typhi*  
MICHAEL MALAVASIC, Georgetown Univ. Med. Sch., Washington, D.C.

Evaluation of Directed Mutation and Alternative Hypotheses  
JOHN MITTLER and RICHARD LENSKI, Univ. of California, Irvine

Summary: Overview and Views  
FRANKLIN W. STAHL, Univ. of Oregon, Eugene

**Session 293 (K)**

**REGULATION OF BIOSYNTHETIC  
PATHWAYS**

Saturday, 1:30 P.M., Room 41

Moderators: R. MEGANATHAN, Northern Illinois Univ., DeKalb, and ALAN J. BIEL, Louisiana State Univ., Baton Rouge

1:30

**K169.** Detection of Phospho-MurNAc-Pentapeptide Translocase by Photoaffinity-Labeled UDP-MurNAc-Pentapeptide. S. B. BERES\* and F. C. NEUHAUS. Northwestern Univ., Evanston, Ill.

**K170.** Isolation and Characterization of Selenolipic Acid-Resistant Mutants of *Escherichia coli*. K. E. REED\* and J. E. CRONAN, JR. Univ. of Illinois, Urbana.

**K171.** Menaquinone (Vitamin K<sub>2</sub>) Biosynthesis: Localization, Cloning, and Sequencing of the *menE* Gene of *Escherichia coli*. V. SHARMA,\* M. E. S. HUDSPETH, and R. MEGANATHAN. Northern Illinois Univ., DeKalb.

**K172.** Oxygen-Regulated Steps in the *Rhodobacter capsulatus* Tetrapyrrole Biosynthetic Pathway. A. J. BIEL. Dept. of Microbiol., Louisiana State Univ., Baton Rouge.

2:30

**K173.** Unusual Pleiotropic Effects of Insertion Mutations in *pdxH* of *Escherichia coli* K-12. H.-M. LAM\* and M. E. WINKLER. Dept. of Microbiol. and Molecular Genetics, Univ. of Texas Med. Sch., Houston.

**K174.** Molecular Characterization of the *cobA* Gene of *Salmonella typhimurium*. S.-J. SUH\* and J. C. ESCALANTE-SEMERENA. Univ. of Wisconsin, Madison.

**K175.** Genetic and Physical Analysis of the Nucleotide Loop Assembly (CobIII) Functions Required for Cobalamin Biosynthesis in *Salmonella typhimurium*. G. A. O'TOOLE\* and J. C. ESCALANTE-SEMERENA. Univ. of Wisconsin, Madison.

**K176.** Purification, Cloning, and Sequence Analysis of the 7 $\alpha$ -Hydroxysteroid Dehydrogenase from *Clostridium absonum*. J. P. COLEMAN,\* L. L. HUDSON, and M. J. ADAMS. Sch. of Med., East Carolina Univ., Greenville, N.C.

3:30

**K177.** Proline Biosynthesis in *Staphylococcus aureus*. D. E. TOWNSEND,\* J. MORROW, and B. J. WILKINSON. Dept. of Biol. Sci., Illinois State Univ., Normal.

**K178.** Elucidation of the Function of the FirA (Ssc) Protein of *Escherichia coli* and *Salmonella typhimurium*. J. COLEMAN\* and A. M. ROY. Louisiana State Univ. Med. Ctr., New Orleans.

SATURDAY

**INNOVATIVE STRATEGIES FOR TEACHING MICROBIOLOGY**

Saturday, 1:30 P.M., Room 13

*Moderators:* I. EDWARD ALCAMO, SUNY at Farmingdale, Farmingdale, N.Y., and JEAN A. DOUTHWRIGHT, Rochester Inst. of Technology, Rochester, N.Y.

**1:30 Carski Award Lecture**  
(Eligible for continuing education credit)

**A Place for Bacterial Diversity in the Microbiology Curriculum: a Plea To Save an Endangered Species**  
JERALD C. ENSIGN, Univ. of Wisconsin, Madison

2:30

**BET10.** Inducible or "SOS" DNA Repair as a Model System To Study Gene Regulation. J. A. DOUTHWRIGHT, Rochester Inst. of Technology, Rochester, N.Y.

**BET11.** Transformation Experiment Utilizing Bioluminescence Genes of *Vibrio fischeri*. J. SLOCK, King's Col., Wilkes-Barre, Pa.

**BET12.** Properties of Bacterial and Viral Pathogens: a Laboratory Course for Advanced Undergraduate and Graduate Students. A. A. SALYERS, D. D. WHITT,\* and C. W. PRATT, Dept. of Microbiol., Univ. of Illinois, Urbana.

**BET13.** Incorporation of Molecular Biology into a First Laboratory Course for Microbiology Majors and Other Life Sciences Students. C. PRATT,\* A. SALYERS, S. LAZAROWITZ, and P. GOODLOVE, Univ. of Illinois, Urbana.

**BET14.** Quantitative Analysis in the Microbial Physiology Laboratory. R. S. TANNER, Univ. of Oklahoma, Norman.

3:30

**BET15.** *Bacillus thuringiensis* Pilot-Scale Fermentation: an Opportunity for Learning Good Laboratory and Good Manufacturing Practices, Safety, and Quality Control/Quality Assurance Practices. R. L. BERNIER,\* L. E. MOSER, and G. P. MOSER, Ecole Polytechnique of Montreal, Montreal, Quebec, Canada, and ICI Bio Products & Fine Chemicals, Mississauga, Ontario, Canada.

**BET16.** Prevalent Biochemistry Misconceptions among College Microbiology Students. F. MAJDI, Univ. of Northern Colorado, Greeley.

**BET17.** Flexible, Multipurpose Clinical Microbiology Curriculum. S. L. SMITH, Florida Internat. Univ., Miami.

**Session 295 (A)**

**$\beta$ -LACTAM RESISTANCE**

Saturday, 1:30 P.M., Room 21

*Moderators:* K. S. THOMSON, Creighton Univ. Sch. of Med., Omaha, Nebr., and R. T. TESTA, Lederle Lab., Pearl River, N.Y.

1:30

**A137.** Effect of pH and CO<sub>2</sub> on Inactivation of TEM-1  $\beta$ -Lactamase by Penicillanic Acid Sulfones. D. M. TIVER, MORE\* and J. F. CORKILL, London Hosp. Med. Col., London, U.K., and Royal Liverpool Univ. Hosp., Liverpool, U.K.

**A138.** Inducible  $\beta$ -Lactamase Activity and Outer-Membrane Protein Electrophoretic Profiles in *Pseudomonas* Species Other than *P. aeruginosa*. C. CIURLI,\* M. RAVAOARINORO, I. TOMA, and R. MORISSET, Hôtel-Dieu de Montreal and Univ. de Montreal, Montreal, Quebec, Canada.

**A139.**  $\beta$ -Lactamases as an Important Resistance Mechanism in Imipenem Resistance in In Vivo Selected *Pseudomonas aeruginosa*. B. GIWERCMAN\* and J. BANGSBORG, Univ. Inst. of Med. Microbiol. and Dept. of Clin. Microbiol., Rigshospitalet, State Serum Institute, Copenhagen, Denmark.

**A140.** Contribution of Membrane Permeability in Non- $\beta$  Lactamase-Mediated Resistance to  $\beta$ -Lactams in Strains of *Haemophilus influenzae* Isolated in Canada. N. CLAIROUX,\* I. R. PARR, JR., E. J. HANSEN, and F. MALOIN, Ctr. de Recherche du Ctr. Hosp. Univ. Laval, Univ. Laval, Quebec, Quebec, Canada; Lilly Res. Lab, Indianapolis, Ind., and Univ. of Texas Southwestern Med. Ctr., Dallas.

2:30

**A141.** Detection of Extended-Spectrum  $\beta$ -Lactamases of *Enterobacteriaceae* in Routine Disk Diffusion Susceptibility Tests. K. S. THOMSON,\* M. E. HAYDEN, C. C. SANDERS, and P. A. BRADFORD, Creighton Univ. Sch. of Med., Omaha, Nebr.

**A142.** Impact of  $\beta$ -Lactamase in Combination with a Change in Outer Membrane Protein on Susceptibility to  $\beta$ -Lactam Antibiotics. P. A. BRADFORD\* and C. C. SANDERS, Creighton Univ. Sch. of Med., Omaha, Nebr.

**A143.** Membrane-Bound Precursor  $\beta$ -Lactamase in Strains of *Moraxella catarrhalis* and *Moraxella nonliquefaciens* Which Produce BRO-1 and BRO-2  $\beta$ -Lactamases. V. A. SIFINGRUBE,\* R. J. WALLACE, JR., and D. BEAULIEU, Univ. of Texas Health Ctr., Tyler, and Eli Lilly & Co., Indianapolis, Ind.

**A144.** Genes That Control Peptidoglycan Composition Are Determinants of Methicillin Resistance in *Staphylococcus aureus*. B. DE JONGE,\* H. DE LENCASRE, Y. S. CHANG, D. GAGE, and A. TOMASZ, Rockefeller Univ., New York, N.Y., and Michigan State Univ., East Lansing.

3:30

**A145.** Saturable Uptake of Imipenem across the Outer Membrane of *Enterobacter cloacae*. F. BELLIDO,\* S. FARMER, and J. C. PECHERE, Univ. of British Columbia, Vancouver, British Columbia, Canada, and Univ. of Geneva, Geneva, Switzerland.

**A146.** Molecular Basis of the Continued Efficacy of Cefaclor against *Haemophilus influenzae*. M. PICARD\* and F. MALOIN, Ctr. de Recherche du Ctr. Hosp. Univ. Laval, Univ. Laval, Quebec, Quebec, Canada.

**A147.** Molecular Cloning and DNA Sequence of Genes Encoding PBP-5 from Ampicillin-Resistant and -Susceptible Non-typeable *Haemophilus influenzae*. D. O. CHAFFIN,\* F. WILEY, C. WADSWORTH, P. M. MENDELMAN, and S. L. MOSELEY, Children's Hosp. and Med. Ctr. and Univ. of Washington, Seattle.

**A148.** Novel Variant of the SHV  $\beta$ -Lactamase Gene in *Klebsiella pneumoniae*. R. COOKSEY,\* E. GAY, F. NOLLE, and F. TENOVER, CDC and Emory Univ., Atlanta, Ga.

**Session 296 (T)**

**MOLECULAR BIOLOGY AND IMMUNOLOGY  
OF HUMAN IMMUNODEFICIENCY VIRUSES**

Saturday, 1:30 P.M., Room 27

*Moderators:* NURUL SARKAR, Med. Col. of Georgia, Augusta, and W. Gallaher, Louisiana State Univ. Med. Ctr., New Orleans

1:30

**T63.** Mutation of the Fusion Peptide of Human Immunodeficiency Virus. A. MARTIN,\* E. HUNTER, and W. GALLAHER. Louisiana State Univ. Med. Ctr., New Orleans, and Univ. of Alabama, Birmingham.

**T64.** Improved Immunogenicity of Human Immunodeficiency Virus Type 1 gp160 expressed by Vaccinia Virus. M. W. CARROLL\* and M. MACKETT. Paterson Inst. for Cancer Res. Manchester, U.K.

**T65.** In Vivo Transactivation of Human Immunodeficiency Virus Type 1 by Herpes Simplex Virus Type 1. O. PRAKASH,\* T.-Y. WANG, R. COLEMAN, and J. M. HILL. Alton Ochsner Med. Fndn. and Louisiana State Univ. Med. Ctr., New Orleans.

**T66.** Transactivation of Human Immunodeficiency Virus Type 1 by JC Virus in Human Fetal Brain Culture: Model of Progressive Multifocal Leukoencephalopathy in AIDS. S. HAGGERTY,\* R. J. FRISQUE, and M. STEVENSON. Univ. of Nebraska Med. Ctr., Omaha, and Pennsylvania State Univ., University Park.

2:30

**T67.** Phosphorylation of Human Immunodeficiency Virus Type 1 p17<sup>HR</sup> by Protein Kinase C In Vivo and In Vitro. B. BURNETTE,\* G. YU, J. WADE, and R. FELSTED. Nat. Cancer Inst., Bethesda, Md., and Univ. of Maryland Cancer Ctr., Baltimore.

**T68.** Anti-CD4 as an Early Marker for Human Immunodeficiency Virus Type 1 Infection. P. KEISER,\* S. KEAY, W. WECKSLER, S. WASSERMAN, and THE MULTICENTER AIDS COHORT STUDY. Univ. of Maryland, Baltimore; SmithKline Beecham Clin. Lab., Van Nuys, Calif.; Bethesda, Md.; and VA Med. Ctr., Baltimore, Md.

**T69.** Inhibition of Human Immunodeficiency Virus Replication by Peptides Containing Viral Nuclear Localization Sequences. J. GULIZIA,\* M. DEMPSEY, N. SHAROVA, M. BUKRINSKY, and M. STEVENSON. Univ. of Nebraska Med. Ctr., Omaha.

**T70.** Human Immunodeficiency Virus (HIV) Infection of HT-29 Intestinal Cells: a Model of HIV Enteropathy. D. M. ASMUTH,\* S. M. HAMMER, and C. A. WANKE. New England Deaconess Hosp., Harvard Med. Sch., Boston, Mass.

3:30

**T71.** Detection of Human T-Cell Lymphotropic Virus Type II (HTLV-II) in the Breast Milk of HTLV-II-Infected Mothers by Using the Polymerase Chain Reaction. W. HENEINE,\* T. WOODS, D. GREEN, F. GRACIA, L. CASTILLO, B. ARMIEN, K. FUKUDA, W. BLATTNER, and J. E. KAPLAN. CDC, Atlanta, Ga.; Gorgas Mem. Lab., Panama; and NIH, Bethesda, Md.

**Session 297 (B). Seminar**

*(Eligible for continuing education credit)*

**PATHOGENESIS OF FOOD-BORNE DISEASE**

Saturday, 1:30 P.M., Room 16

*Convenors:* PAULA J. FEDORKA-CRAY and IRENE V. WESLEY, Nat. Animal Disease Ctr., Ames, Iowa

Listeria in Beef Cattle  
DANIEL PORTNOY, Univ. of Pennsylvania, Philadelphia

Salmonella in Chickens  
ROY CURTISS III, Washington Univ., St. Louis, Mo

Food-Borne Pathogens in Seafoods  
MARLEEN M. WEKELL, FDA, Seattle, Wash

Salmonella in Domestic Animals  
PAULA J. FEDORKA-CRAY, Nat. Animal Disease Ctr., Ames, Iowa

*Campylobacter jejuni* in Chickens  
RICHARD J. MEINERSMANN, USDA, Agricultural Res. Service, Athens, Ga.

**Session 298 (G, C). Seminar**

*(Eligible for continuing education credit)*

**BOVINE SPONGIFORM ENCEPHALOPATHY:  
"MAD COW DISEASE"**

Saturday, 1:30 P.M., Room 19

*Convenors:* FRANK O. BASTIAN, Col. of Med., Univ. of South Alabama, and RICHARD F. MARSH, Sch. of Vet. Med., Univ. of Wisconsin, Madison

Bovine Spongiform Encephalopathy as a Transmissible Spongiform Encephalopathy: Relationship to Human Disease and Nature of the Agent  
FRANK O. BASTIAN, Univ. of South Alabama, Mobile

Clinical Aspects and Relationships of Bovine Spongiform Encephalopathy and Other Transmissible Spongiform Encephalopathies in Livestock  
JAMES L. HOURRIGAN, USDA, Vienna, Va.

Epidemiology and Current Status of Bovine Spongiform Encephalopathy in Europe  
JOHN W. WILESMITH, Central Vet. Lab., Weybridge, Surrey, England

Potential Occurrence of Bovine Spongiform Encephalopathy in the United States of America  
RICHARD F. MARSH, Sch. of Vet. Med., Univ. of Wisconsin, Madison

Policies of the USDA in Circumventing Potential Bovine Spongiform Encephalopathy Contamination of Food Supply and Biologics  
LINDA A. DETWILER, AVIC New Jersey, USDA, APHIS, Trenton

SATURDAY



## CAPSULE EXPRESSION BY BACTERIAL PATHOGENS

Saturday, 1:30-3:00 P.M., Exhibit Hall C

(Board numbers in parentheses)

Saturday, 1:30 P.M., Room 33

**Moderators:** CHRIS WHITFIELD, Univ. of Guelph, Guelph, Ontario, Canada, and YOSHICHIKA ARAKAWA, Nagoya Sch. of Med., Nagoya, Aichi, Japan

1:30

- D223.** Variation in Expression of Capsular Polysaccharide by *Neisseria meningitidis* during Nasopharyngeal Colonization. W. D. ZOLLINGER,\* D. A. CAUGANT, N. SAUNDERS, B. BRANDT, and E. MORAN. Walter Reed Army Inst. of Res., Washington, D.C., and NIPH, Oslo, Norway.
- D224.** Analysis of *Streptococcus pneumoniae* Mutants Defective in Type 3 Capsular Polysaccharide Synthesis. J. DILLARD\* and J. YOTHER. Univ. of Alabama, Birmingham.
- D225.** Genomic Organization of *Klebsiella cps* Cluster. Y. ARAKAWA,\* R. WACHAROTAYANKUN, M. OHTA, M. MORI, T. HORII, and N. KATO. Nagoya Univ. Sch. of Med., Nagoya, Japan
- D226.** Salicylate or Bismuth Salts Promote *Klebsiella pneumoniae* Phagocytosis by Repression of Capsular Polysaccharide. P. DOMENICO,\* R. SALO, D. C. STRAUS, and B. A. CUNHA. Winthrop-Univ. Hosp., Mineola, N.Y.; Nassau County Med. Ctr., East Meadow, N.Y.; and Texas Tech Univ., Lubbock.

2:30

- D227.** Deletion Analysis and Purification of KpsD, a 60-kDa Periplasmic Protein Involved in the Transport of Polysialic Acid of *Escherichia coli* K1. D. E. WUNDER\* and R. P. SILVER. Univ. of Rochester, Rochester, N.Y.
- D228.** Sequence and Structural Homology between *Escherichia coli* K1 and K92 Polysialyltransferases. S. STEENBERGEN, R. BERGSTROM, and E. VIMR.\* Univ. of Illinois, Urbana.
- D229.** Analysis of KpsT, a Protein Involved with Capsular Polysaccharide Expression in *Escherichia coli* K1. M. S. PAVELKA\* and R. P. SILVER. Univ. of Rochester, Rochester, N.Y.
- D230.** Expression of Colanic Acid in Encapsulated *Escherichia coli* Strains. W. J. KEENLEYSIDE,\* P. JAYARATNE, and C. WHITFIELD. Dept. of Microbiol., Univ. of Guelph, Guelph, Ontario, Canada.

3:30

- D231.** Cloning and Nucleotide Sequence of DNA Controlling Transcription of the *algA* Gene in an Alginate-Producing Strain of *Pseudomonas aeruginosa*. D. SHINABARGER,\* T. B. MAY, and A. BOYD. Univ. of Illinois, Chicago.
- D232.** Involvement of Integration Host Factor in the Regulation of *Pseudomonas aeruginosa* Alginate Genes *algB* and *algD*. D. J. WOZNIAK. Univ. of Tennessee and VA Med. Ctr., Memphis.
- D233.** Cloning of *Pseudomonas aeruginosa* Alginate Lyase Gene (*algL*) and Expression in *Escherichia coli*. N. L. SCHILLER. Univ. of California, Riverside.

## Session 300 (C). SERODIAGNOSIS I

- C380.** Comparison of Commercial Enzyme Immunoassays with Latex Agglutination Methods for Detection of Antibody to Cytomegalovirus and Rubella Virus. (001) J. HAYEK,\* S. AMATO, A. GREEN, and P. C. DE GIROLAMI. New England Deaconess Hosp. and Harvard Med. Sch., Boston, Mass.
- C381.** Simultaneous Detection of Cytomegalovirus-Specific Immunoglobulin (IgG) and IgM Antibodies Using a Single Screening Enzyme-Linked Immunoassay Test. (003) J. CORBO, L. MCCLAIN,\* R. STEINHAUSER, R. BRAUER, I. BUCK, E. PAULY, and H. PEISELER. Behring Diagnostics Inc., Somerville, N.J., and Behringwerke AG, Marburg, Germany.
- C382.** Recombinant Protein-Based Enzyme Immunoassay for Immunoglobulin M Antibodies to Human Cytomegalovirus. (005) P. WONG,\* G. WHITELEY, L. BURGESS, B. HOFFMAN, E. METZMANN, H.-P. HARTHUS, and L. WIECZOREK. PB Diagnostic Systems, Inc., Westwood, Mass., and Behringwerke AG, Marburg, Germany.
- C383.** Comparative Evaluation of the CARDS OS Test with the Infectious Mononucleosis Kit for Detection of Infectious Mononucleosis Heterophile Antibodies. (007) S. FINN,\* S. F. FARHAT, R. CHUA, B. SMITH, A. E. SIMOR, B. DIENA, and M. SKULNICK. Mount Sinai Hosp. and Daniel Lab., Toronto, Ontario, Canada.
- C384.** Two-Site Comparison of Mono-Latex Test and Mono-Plus Immunosorbent Assay. (009) D. HALSTEAD, S. WILLIAMS,\* G. FRITCH, and A. T. EVANGELISTA. HealthEast Labs., Allentown, Pa.; Cooper Hosp./Univ. Med. Ctr., Camden, N.J.; and Med. Col. of Pennsylvania, Philadelphia.
- C385.** Evaluation of Epstein-Barr Virus Viral Capsid Antigen (Immunoglobulin G [IgG] and IgM) and Epstein-Barr Nuclear Antigen (IgG) Enzyme Immunoassay Serologies as Compared with Immunofluorescence. (011) C. S. SIEGEL\* and S. GOODREAU. Bellin Mem. Hosp., Green Bay, Wis.
- C386.** Evaluation of Five Enzyme Immunoassays for Immunoglobulin M Antibodies to Epstein-Barr Virus Viral Capsid Antigens. (013) D. L. WIEDBRAUK\* and S. BASSIN. Dept. of Clin. Pathology, William Beaumont Hosp., Royal Oak, Mich.
- C387.** Preclinical Evaluation of the MicroTrak II Immunoglobulin M (IgM) Anti-Hepatitis A Virus (HAV) Enzyme Immunoassay for Detection of IgM Antibodies to HAV in Serum or Plasma. (015) R. RODGERS,\* J. GAUER, W. CHEN, B. EKBERG, E. GEHRIG, W. MCMILLAN, S. SAKAI, and R. EGAN. Syva Co., San Jose, Calif.
- C388.** Cost-Effectiveness of Repeat Testing To Verify Reactive Hepatitis Marker Results in an Enzyme Immunoassay System. (017) A. ROBINSON,\* E. EPP, and J. TETREAU. Hartford Hosp., Hartford, Conn.
- C389.** Evaluation of New Second-Generation Enzyme Immunoassays for the Detection of Hepatitis C Antibody. (019) A. E. SIMOR,\* R. BAILLARGEON, and S. V. FEINMAN. Mount Sinai Hosp., Univ. of Toronto, Toronto, Ontario, Canada.
- C390.** Evaluation of a Second-Generation Human Immunodeficiency Virus Type 1 (HIV-1)/HIV-2 Confirmatory Test. (021) C. MILLER, R. SHOCKLEY,\* and R. NEWHOUSE. Serologicals, Inc., Clarkston, Ga., and Murex Corp., Norcross, Ga.

- C391. Comparison of the GENIE 1/2 Test with Reference Methods for Detection of Antibodies to Human Immunodeficiency Virus Type 1. (023) L. M. WILCOSKI,\* L. GORNIK,\* W. M. JANDA, K. L. MANDEL, and J. M. STEVENS Univ. of Illinois Hosp., Chicago.
- C392. Detection of Antibodies to Human Immunodeficiency Virus Type 1 (HIV-1) in Serum by Using the Recombinant MicroTrak HIV-1 Enzyme Immunoassay. (025) C. A. GLEAVES,\* R. DWORKIN, and D. GILBERT. Providence Med. Ctr., Portland, Oreg.
- C393. A Rapid, Fully Automated Enzyme-Linked Immuno-fluorescent Assay for the Detection of Immunoglobulin G Antibodies to Mumps Virus. (027) J. THURSTON,\* S. LARSEN, and S. BROMLEY. BioMerieux Vitek Inc., Rockland, Mass.
- C394. Comparative Evaluation of Two Tests for Parvovirus B19 Antibody. (029) N. SMITH, R. C. TILTON, and K. BUCHANAN,\* North American Lab. Group, New Britain, Conn.
- C395. Comparison of Enzyme-Linked Immunosorbent Assay Test Kits for Measurement of Immunoglobulin G (IgG) and IgM Serum Antibodies to Human Parvovirus B19. (031) P. J. KNIGHT,\* D. J. CAUGHEY, L. KONG, and R. K. PORSCHE. Hillerst Biologicals, Cypress, Calif.
- C396. Comparison of a Novel Synthetic Peptide-Based Enzyme Immunoassay (DETECT-Rubella) with Enzygnost and IMx for the Detection of Rubella Immunoglobulin G Antibodies. (033) L. PEDNEAULT,\* L. ROBILLARD, F. LANDRY, J. JONCAS, M. LACROIX, and M. ZREIN. Hôpital Ste-Justine, Univ. de Montreal, and IAF BioChem, Montreal, Quebec, Canada.
- C397. Comparison of Rubascan and Rubalex Latex Agglutination Test Systems for Evaluation of Rubella Immune Status. (035) E. T. SIMPSON, L. CHARLES, L. L. HOLLAND, and M. A. SAUBOLLE.\* Good Samaritan Regional Med. Ctr., Phoenix, Ariz.
- C398. Quantitation of Rubella Virus-Specific Immunoglobulin G Antibodies by an Enzyme-Linked Immunosorbent Assay Incorporating the Single-Dilution  $\alpha$ -Method. (037) L. MCCLAIN,\* R. STEINHAUSER, T. BUCK, H. DOPATKA, B. GIESENDORF, B. MARTENS-DURING, and B. REICHEL. Behring Diagnostics Inc., Somerville, N.J., and Behringwerke AG, Marburg, Germany.
- C399. Evaluation of Rubella Immune Status by the Vidas Rubella IgG Immunoassay Compared with Rubacell. (039) J. GUN-MUNRO, P. LYN,\* P. DRUMMOND, F. SMAILL, M. CHERNESKY, and H. RICHARDSON. Chedoke McMaster Hosp. and St. Joseph's Hosp., Hamilton, Ontario, Canada.
- C400. Viral Conjugate-Based Enzyme Immunoassay for Antibodies to Rubella Virus. (041) G. WHITELEY,\* P. WONG, T. DOUROS, K. DESPLAINES, K. TRIER, B. HOFFMAN, E. METZMANN, and R. ZIEGELMAIER. PB Diagnostic Systems, Inc., Westwood, Mass., and Behringwerke AG, Marburg, Germany.
- C401. Evaluation of Latex-Based Agglutination Assays Using the Cambridge BioTech Slide Instrument Reader. (043) P. WENDLER,\* R. M. PETRONE, J. LAMALVA, and T. CHAN. Cambridge BioTech, Worcester, Mass.
- gy and Chlamydiology Lab., St. Joseph's Hosp., Hamilton, Ontario, Canada.
- C403. Absence of Cross-Reactivity between Chlamydia and Respiratory Viruses. (047) H. FADEN,\* D. DRYJA, P. MEYER, M. RIEPENHOFF-TALTY, and B. SPADA. SUNY at Buffalo and Children's Hosp., Buffalo, N.Y.
- C404. Chlamydia Culture and Blocking Antibody Assays Reveal High Rates of False Reactivity in a High-Risk (Prostitute) Female Population. (049) B. CAHOON-YOUNG,\* A. CHANDLER, R. RYALS, P. DADONE, T. DUFAULT, and R. BENJAMIN. Alameda County Publ. Health Lab., Oakland, Calif.
- C405. Accuracy of *Chlamydia trachomatis* Detection Techniques in a Pediatric Population in the Intermountain West. (051) J. A. DALY,\* E. K. KORGESKI, and W. M. GOOCH III. Primary Children's Med. Ctr. and Univ. of Utah, Salt Lake City.
- C406. Detection of Chlamydiae in a High Incident Population by Two Rapid Methods Compared to Cell Culture. (053) E. ADAMS,\* J. MOORE, and P. HARRIS. Fort Worth-Tarrant County Publ. Health Dept., Fort Worth, Tex., and Baxter/Bartels Diagnostics Div., Issaquah, Wash.
- C407. Comparison of Several Commercial Kits for the Diagnosis of Chlamydial Disease in Koalas. (055) M. M. WOOD and P. TIMMS.\* Ctr. for Molecular Biotechnology, Queensland Univ. of Technology, Brisbane, Australia.
- C408. Direct Detection of *Chlamydia trachomatis* in Urine. Using a Rapid, Polymerase Chain Reaction-Based Diagnostic Test. (057) S. A. HERMAN,\* C. LEWINSKI, J. LEFEBVRE, M. MARCHAND, J.-G. BARIL, and B. DRAGON. Roche Diagnostic Systems, Fair Lawn, N.J., and Lab. de Santé Publ. du Quebec, Clin. Actuel, and Clin. Mont-Carmel, Montreal, Quebec, Canada.
- C409. Comparison of Two Urine Enzyme Immunoassays and Culture for Detection of *Chlamydia trachomatis* Urethritis in Asymptomatic Men. (059) J. W. SANDERS,\* L. WELSH, G. JASCHEK, E. HOOK III, and T. C. QUINN. Johns Hopkins Univ., Baltimore, Md., and Nat. Inst. of Allergy and Infectious Diseases, Bethesda, Md.
- C410. Performance of the Vitek VIDAS *Chlamydia* Assay in the Detection of *Chlamydia* in Male Urethral and Urine Specimens. (061) R. C. BUTLER. Arlington Hosp., Arlington, Va.
- C411. Clinical Evaluation of an Automated Enzyme-Linked Fluorescent Assay for the Detection of Chlamydial Antigen in Urine and Urethral Swabs in Males. (063) O. STEINGRIMSSON,\* J. H. OLAFSSON, E. SIGVALDADOTTIR, and R. PALSDOTTIR. Dept. of Microbiol. and Dept. of Venereology, Univ. of Iceland, Reykjavik, Iceland.
- C412. *Chlamydia trachomatis* Antigen Detection with an Automated System. (065) C. YEHLE,\* J. GILL, K. DEIS, C. WALTER, K. CORTS, and R. ROBERTSON. Boehringer Mannheim Corp., Indianapolis, Ind.
- C413. Blocking Antibody and Direct Fluorescent Antibody Confirmation of Chlamydial Antigen below the Detection Threshold of the Chlamydiazyme Test. (067) J. A. KELLOGG,\* J. W. SEIPLE, and E. S. STROLL. York Hosp., York, Pa.
- C414. Evaluation of Different Breakpoints for the Chlamydiazyme Assay for Detection of Chlamydial Antigen in Specimens from High-Risk Patients. (069) K. G. KRISTINSSON, R. W. RYAN, J. H. OLAFSSON, S. KARLSSON, R. PALSDOTTIR, and O. STEINGRIMSSON.\* Dept. of Microbiol. and Dept. of Venereology, Univ. of Iceland, Reykjavik, Iceland, and Dept. of Lab. Med., Univ. of Connecticut Sch. of Med., Farmington.
- C415. Comparison of the CLEARVIEW *Chlamydia*, PACE 2 Assay, and Culture for the Detection of *Chlamydia* from

### Session 301 (C). CHLAMYDIA

- C402. Performance of Various Plasmid and Chromosomal Polymerase Chain Reaction Primers for Detecting *Chlamydia trachomatis*. (045) J. B. MAHONY,\* K. E. LUINSTR, and M. A. CHERNESKY. McMaster University Regional Virolo-

- Cervical Specimens. (071) J. BLANDING,\* L. HIRSCH, N. STRATTON, T. WRIGHT, and E. PETERSON. Univ. of California-Irvine Med. Ctr., Orange.
- C416. *Chlamydia trachomatis* Detection in Cervical Specimens by Filter Collection of Immune Complexes Containing Major Outer Membrane Protein Peptide-Specific, Affinity-Purified Antibody-Enzyme Conjugates. (073) C. MILLER,\* S. THOMPSON, K. MESSENGER, W. NOWICKI, P. JOHNSON, C. SWARTZELL, G. SVANAS, J. CASPER, and J. HELSER. Miles Diagnostics, Miles, Inc., Elkhart, Ind.
- C417. Buffalo Green Monkey Kidney (BGMK) Cells as an Alternative to McCoy Cells for Cultivation of *Chlamydia trachomatis*. (075) L. M. CLARKE,\* P. GREGORY, B. DAIDONE, J. COVINO, W. M. MCCORMACK, and M. F. SIERRA. SUNY Health Sci. Ctr., Brooklyn, N.Y.
- C418. Comparison of McCoy with Commercial BGMK Cells for Isolation of *Chlamydia trachomatis*. (077) S. F. REISING\* and J. DOUGHMAN. Children's Hosp. Med. Ctr., Cincinnati, Ohio.
- C419. Comparison of Chlamydia Culture with Three Cytospin Modified Direct Fluorescent Antibody Chlamydia Antigen Assays. (079) D. R. BROWN,\* J. M. BROESTLER, D. J. SNELL, and J. P. PIPER. David Grant U.S. Air Force Med. Ctr., Travis Air Force Base, Calif.
- C420. Evaluation of a New Polymerase Chain Reaction Test for Detection of *Chlamydia trachomatis* in Clinical Samples. (081) D. L. JUNGKIND, N. S. SILVERMAN, C. A. BASS,\* and J. M. BONDI. Thomas Jefferson Univ., Philadelphia, Pa.
- C421. Comparison of Roche Chlamydia Polymerase Chain Reaction Test to McCoy Cell Culture in Obstetric Patients. (083) V. BASELSKI,\* B. MERCER, and B. SHAW. Dept. of Pathology and Dept. of Obstetrics and Gynecology, Univ. of Tennessee, Memphis.
- C422. Diagnosis of *Chlamydia trachomatis* Endocervical Infection by Polymerase Chain Reaction Assay. (085) J. E. BAUWENS,\* A. M. CLARK, S. A. HERMAN, C. LEWINSKI, and W. E. STAMM. Univ. of Washington, Seattle, and Roche Diagnostic Systems, Fair Lawn, N.J.
- C423. Comparison of Six Cell Lines for the Culture of *Chlamydia pneumoniae*. (087) P. A. WEBER,\* M. L. BUCK, and D. G. HOOPER. Lab. Dept., Naval Hosp., San Diego, Calif.
- C424. Prevalence of *Chlamydia pneumoniae* in a Community Hospital. (089) L. ILLUMINATI,\* C. JEMAL, V. DRE-LICHMAN, and W. D. LEBAR. Providence Hosp., Southfield, Mich.
- C425. Development of a Nonisotopic DNA Probe Assay for Detection of *Chlamydia pneumoniae*. (091) E. MATHER,\* M. ALDEN, A. STARK, A. A. ENDOZO, and R. BRYAN. Gen-Probe, Inc., San Diego, Calif.
- V30. Comparison of Three Methods for the Detection of *Mycoplasma pneumoniae* Antibodies. (097) M. HARZIC,\* C. CHAPLAIN, J. C. ALVAREZ, and J. C. GHNASSIA. Service de Microbiol., Ctr. Hosp., Versailles, France.
- V31. Evaluation of Pharmacia Measles IgM ELISA with Hemagglutination Inhibition on Paired Serum Specimens. (099) L. TABONY\* and W. HODGSON. Texas Dept. of Health, Austin.
- V32. Development of an Enzyme-Linked Immunosorbent Assay for Detection of Human Immunoglobulin G against Epstein-Barr Virus Early Antigen Diffuse. (101) L. M. PFEIFER,\* S. K. FRANK, B. G. MARKHAM, C. M. HAAS, J. L. PUTNUM, and S. C. LEE INCSTAR Corp., Stillwater, Minn.
- V33. Second-Generation Recombinant Immunoblot Analysis for the Diagnosis of Hepatitis C Virus Infections. (103) D. L. SMALLEY,\* M. F. HALL, and C. A. RIELY. Univ. of Tennessee and Baptist Regional Lab., Memphis.
- V34. Synthetic Peptide-Based Immunoassay for the Detection of Antibodies to Hepatitis C Virus. (105) J. W. MORGAN,\* P. COLEMAN, P. SU, J. PAYNE, and F. AUBRIT. Genetic Systems Corp., Redmond, Wash., and Sanofi Diagnostics Pasteur, Marnes La Coquette, France.
- V35. Identification of an Immunodominant Domain in the e33c Region of Hepatitis C Virus. (107) J. KINK,\* B. SAEED, T. RYAN, and J. TODD. Baxter Diagnostics Inc., Pandex, Mundelein, Ill.
- V36. Novel Method for Attaching Synthetic Peptides to Solid Phases: Applications to Hepatitis C Virus Serologic Testing. (109) D. SHAH, D. LEAHY, A. SCHNEIDER, and J. TODD.\* Baxter Diagnostics, Pandex, Mundelein, Ill.
- V37. Human Immunodeficiency Virus Type 1 (HIV-1) Antibody Screening Tests: Comparison of Ortho Diagnostics Recombigen HIV-1 Enzyme Immunoassay (EIA) with Genetic Systems Viral Lysate EIA. (111) P. MATZNER,\* D. BALLOU, and J. SALYER. S.E.D. Med. Lab., Albuquerque, N. Mex.
- V38. Development of a Rapid Human Immunodeficiency Virus Type 1 and 2 Assay Using the Cambridge Biotech Agglutination Slide and Slide Instrument Reader. (113) R. M. PETRONE,\* J. LAMALVA, and T. CHAN. Cambridge Bio-Tech, Worcester, Mass.
- V39. Automated Novel Enzyme Immunoassay for Detection of Antibodies to Human Immunodeficiency Virus Types 1 and 2 in Donor Serum and Plasma. (115) P. PLIER,\* J. WACHHOLZ, K. WALKER, and E. NICOL. Baxter Diagnostic Inc., Pandex Div., Mundelein, Ill.
- V40. Development of an Antibody Capture Immunoglobulin M Radioimmunoassay for Diagnosis of Acute Cytomegalovirus and Hepatitis A and B Virus Infections. (117) Z. GARCIA,\* L. TAYLOR, and K. A. VISONA. Louisiana State Univ.-Internat. Ctr. for Med. Res. and Training, San José, Costa Rica.
- V41. Automated Novel Enzyme Immunoassay for Detection of Antibodies to Human T-Lymphotropic Virus Type I/II in Donor Serum and Plasma. (119) C. COLE, B. PREISEL-SIMMONS,\* L. SMITH, and E. NICOL. Baxter Diagnostic Inc., Pandex Div., Mundelein, Ill.
- V42. Detection of Virus-Specific Antibodies in Commercial Preparations of Human Intravenous Immune Globulin. (121) R. L. HODINKA,\* G. PETTY, and D. SCHAIBLE. Children's Hosp., Philadelphia, Pa.
- V43. Comparative Immunogenicity of Two Different Doses of Hepatitis B Vaccine in Adolescents. (123) J. ZELDIS\* and H. RATHFON. Univ. of California-Davis, Sacramento, and SmithKline Beecham, Philadelphia, Pa.

### Session 302 (V). HEPATITIS VIRUS, HUMAN IMMUNODEFICIENCY VIRUS, AND OTHER VIRAL AND MYCOPLASMA INFECTIONS

- V28. Comparison of the VZVscan Varicella-Zoster Antibody Test-Latex Agglutination with the Varicella Stat Enzyme-Linked Immunosorbent Assay. (093) D. V. FERRERO,\* N. A. BURGESS, and H. MEYERS. San Joaquin County Publ. Health Services Lab., Stockton, Calif.
- V29. Detection of Influenza A in Retrospective Clinical Specimens by Using the BD Directigen Influenza A Membrane Assay. (095) C. NYCZ,\* D. MCLAURIN, A. HOPKINS, and K. SEMPER. Becton Dickinson Res. Ctr., Research Triangle Park, N.C.

**Session 303 (B). HAEMOPHILUS AND BRANHAMELLA SPP.: SURFACE COMPONENTS AND DYNAMICS OF COLONIZATION**

- 1371.** Molecular Cloning of the Gene Encoding the P2 Protein of Nontypeable *Haemophilus influenzae*. (125) J. D. SANDERS,\* L. D. COPE, I. MACIVER, J. L. LATIMER, and E. J. HANSEN. Univ. of Texas Southwestern Med. Ctr., Dallas.
- 1372.** Molecular Analysis of the P2 Genes of Nontypeable *Haemophilus influenzae*. (127) D. J. SIKKEMA\* and T. F. MURPHY. SUNY at Buffalo and Buffalo VA Med. Ctr., Buffalo, N.Y.
- 1373.** Identification of Conserved B-Cell Epitopes among P2 and 15-kDa Proteins from Encapsulated and Nonencapsulated *Haemophilus influenzae*. (129) D. DUGOURD, J. HAMEL,\* W. L. ALBRITTON, and B. R. BRODEUR. Nat. Lab. for Immunology, Lab. Ctr. for Disease Control, Ottawa, Ontario, Canada, and Provincial Lab. of Publ. Health for Northern Alberta, Alberta, Canada.
- 1374.** Genetic Analysis of the Variability in Outer Membrane Protein P2 of Nonencapsulated *Haemophilus influenzae*. (131) B. DUIM,\* J. DANKERT, H. M. JANSEN, and L. VAN ALPHEN. Dept. of Med. Microbiol. and Dept. of Pulmonology, Academic Med. Ctr., Amsterdam, The Netherlands.
- 1375.** Structural and Immunological Properties of a Conserved Surface Exposed Epitope on the Protein 6 of *Haemophilus influenzae*. (133) J. A. BOGDAN. SUNY at Buffalo, Buffalo, N.Y.
- 1376.** Immunologic Recognition of a Conserved 72-kDa Protein in Strains of *Haemophilus influenzae* Biogroup aegyptius Associated with Brazilian Purpuric Fever. (135) A. LESSE\* and W. BITTNER. SUNY at Buffalo and Buffalo VA Hosp., Buffalo, N.Y.
- 1377.** Cloning and Characterization of *lppB*, a Gene Encoding an Antigenic 40-kDa Lipoprotein of *Haemophilus somnus*. (137) M. THEISEN, C. R. RIOUX,\* and A. A. POTTER. Vet. Infectious Disease Organization, Univ. of Saskatchewan, and Canadian Bacterial Diseases Network, Saskatoon, Saskatchewan, Canada.
- 1378.** Preliminary Characterization of the Lipooligosaccharides from *Haemophilus influenzae* Type b Strain A2. (139) N. PHILLIPS,\* L. REINDERS, R. MCLAUGHLIN, J. M. GRIFFISS, and B. GIBSON. Univ. of California, San Francisco, and SUNY at Buffalo, Buffalo, N.Y.
- 1379.** Analysis of Lipooligosaccharide Phenotypes Produced by Mutagenesis of the *Haemophilus influenzae* Type b *lsg* Loci. (141) R. MCLAUGHLIN,\* S. SPINOLA, and M. APICELLA. SUNY at Buffalo, Buffalo, N.Y.
- 1380.** Sequence Analysis of the 7.4-kb Lipooligosaccharide Synthesis Gene (*lsg*) Cluster Isolated from *Haemophilus influenzae* Type b. (143) R. MCLAUGHLIN,\* Y. ABU KWAIK, S. SPINOLA, and M. APICELLA. SUNY at Buffalo, Buffalo, N.Y.
- 1381.** Use of Pyocin To Select a Lipooligosaccharide Variant of *Haemophilus ducreyi*. (145) A. CAMPAGNARI,\* W. MELAUGH, N. PHILLIPS, R. KARALUS, and B. GIBSON. Dept. of Med., SUNY at Buffalo, Buffalo, N.Y., and Dept. of Pharmaceutical Chemistry, Univ. of California, San Francisco.
- 1382.** The Major Lipooligosaccharide from *Haemophilus ducreyi* 35000 Contains a Terminal Lactosamine That Is Sialylated. (147) W. MELAUGH,\* N. PHILLIPS, A. CAMPAGNARI, R. KARALUS, and B. GIBSON. Univ. of California, San Francisco, and SUNY at Buffalo, Buffalo, N.Y.
- 1383.** Colonization of the Rat Nasopharynx by *Haemophilus influenzae* Is Associated with Transparent Colony Phenotype. (149) J. N. WEISER. Rockefeller Univ., New York, N.Y.

- B384.** Pathogenic Factors of *Haemophilus influenzae* Isolated from Respiratory Tracts of Individuals with Cystic Fibrosis. (151) D. L. BLECKER\* and J. E. MORTENSEN. St. Christopher's Hosp. for Children and Temple Univ. Sch. of Med., Philadelphia, Pa.
- B385.** Two Morphologically Distinct Colonies of Nontypeable *Haemophilus influenzae* Isolated from Lung Secretions. (153) A. PYE,\* J. L. MITCHELL, M. JOHNSON, D. BURNETT, R. A. STOCKLEY, and S. L. HILL. Gen. Hosp., Birmingham, U.K.
- B386.** Longitudinal Studies of Nontypeable *Haemophilus influenzae* in Lung Secretions of Patients with Bronchiectasis. (155) A. PYE, J. MITCHELL, M. JOHNSON, D. BILTON, T. MURPHY, R. A. STOCKLEY, and S. L. HILL.\* Gen. Hosp., Birmingham, U.K., and SUNY at Buffalo, Buffalo, N.Y.
- B387.** Antigenic Heterogeneity among Outer Membrane Proteins of *Branhamella catarrhalis*. (157) J. SARWAR\* and T. F. MURPHY. SUNY at Buffalo and Buffalo VA Med. Ctr., Buffalo, N.Y.
- B388.** Identification and Purification of the Lipooligosaccharide-Associated High-Molecular-Weight Outer Membrane Protein of *Branhamella catarrhalis*. (159) K. L. KLINGMAN\* and T. F. MURPHY. SUNY-Bufferalo and Buffalo VA Med. Ctr., Buffalo, N.Y.

**Session 304 (B). ADHERENCE OF PATHOGENS TO HOST CELLS: FIMBRIAE AND OTHER ADHESINS**

- B389.** Linear B-Cell Epitope Mapping and Resolution of Primary Structure of *Escherichia coli* CFA/I. (161) F. J. CASSELS,\* C. D. DEAL, R. H. REID, D. L. JARBOE, J. M. CARTER, B. H. BYUN, and E. C. BOEDEKER. Walter Reed Army Inst. of Res., Washington, D.C.
- B390.** Functional Heterogeneity of Type 1 Fimbriae of *Escherichia coli*. (163) E. SOKURENKO, H. COURTNEY, S. ABRAHAM, P. KLEMM, and D. HASTY.\* Univ. of Tennessee and VA Med. Ctr., Memphis; Washington Univ., St. Louis, Mo.; and Tech. Univ. of Denmark, Lyngby, Denmark.
- B391.** Expression of Type 1 Fimbria Reduces Mortality from *Escherichia coli* Peritonitis in Rats. (165) A. MAY,\* M. SPENGLER, R. SAWYER, and T. PRUETT. Univ. of Virginia, Charlottesville.
- B392.** Identification of 2134P, a Bacterial Adhesin on Enterotoxigenic *Escherichia coli* from Weaned Pigs. (167) E. A. DEAN-NYSTROM,\* T. A. CASEY, R. A. SCHNEIDER, and B. NAGY. Nat. Animal Disease Ctr., USDA, Agricultural Res. Service, Ames, Iowa.
- B393.** Molecular Cloning of F165<sub>1</sub>, a Prs-Like Fimbrial Antigen from Porcine Septicemic *Escherichia coli*. (169) J. HAREL,\* F. DAIGLE, S. N. MAITI, J. D. DUBREUIL, M. JACQUES, and J. M. FAIRBROTHER. Dept. of Pathology and Microbiol., Faculty of Vet. Med., Montreal Univ., St-Hyacinthe, Quebec, Canada.
- B394.** Role of F165 Fimbriae in Resistance of Septicemic *Escherichia coli* O115 to Phagocytosis In Vitro. (171) M. NGELEKA\* and J. M. FAIRBROTHER. Faculty of Vet. Med., Dept. of Pathology and Microbiol., Montreal Univ., St-Hyacinthe, Quebec, Canada.
- B395.** Pigeon and Dove Eggwhite as P Fimbrial Inhibitors for *Escherichia coli* Strains That Cause Urosepsis. (173) J. R. JOHNSON\* and A. E. ROSS. Univ. of Minnesota, Minneapolis.
- B396.** Molecular Characterization of Binding Epitopes on Decay-Accelerating Factor for *Escherichia coli* Clones That

- Express Dr. AFAl, AFAlII, and F1845 Adhesins. (175) B. NOWICKI,\* A. HART, D. LUBLIN, and S. NOWICKI. Univ. of Texas Med. Branch, Galveston, and Washington Univ., St. Louis, Mo.
- B397.** Inhibition of Oxidative Burst of Human Polymorphonuclear Leukocytes by Pap G Component of the Tip Fibrillum of *Escherichia coli* P Pili. (177) R. TEWARI,\* T. IKEDA, J. R. LITTLE, J. MACGREGOR, S. HULTGREN, and S. N. ABRAHAM. Washington Univ. Sch. of Med., St. Louis, Mo.
- B398.** Molecular Basis for the Interaction between *Escherichia coli* and Gonadotropin Hormones during the Menstrual Cycle. (179) A. HART,\* M. MARTENS, and B. NOWICKI. Univ. of Texas Med. Branch, Galveston.
- B399.** Molecular Mechanism of Interaction between *Escherichia coli* and Human Chorionic Gonadotropin Hormone. (181) B. NOWICKI,\* A. HART, and S. NOWICKI. Univ. of Texas Med. Branch, Galveston.
- B400.** Expression of Toxin-Coregulated Pilus in *Vibrio cholerae* O1 In Vitro and In Vivo. (183) G. JONSON,\* J. HOLMGREN, and A.-M. SVENNERHOLM. Dept. of Med. Microbiol. and Immunology, Univ. of Göteborg, Göteborg, Sweden.
- B401.** Thin, Aggregative Fimbriae Mediate Binding of *Salmonella enteritidis* to Fibronectin. (185) S. K. COLLINSON,\* L. EMODY, P. DOIG, K.-H. MULLER, T. TRUST, and W. KAY. Univ. of Victoria, Victoria, British Columbia, Canada, and Univ. Med. Sch., Pécs, Hungary.
- B402.** A 22-kDa Adhesin of Piliated *Pseudomonas cepacia* Mediates Adherence to Both Mucin and Epithelial Cell Receptors. (187) U. SAJJAN\* and J. FORSTNER. Biochemistry Dept., Hosp. for Sick Children, and Univ. of Toronto, Toronto, Ontario, Canada.
- B403.** Analysis of Type 1-Like Fimbria Production by *Pseudomonas cepacia*. (189) M. CERVIN,\* J. HAGENZIEKER, S. LORY, and A. L. SMITH. Children's Hosp. and Med. Ctr. and Univ. of Washington, Seattle.
- B404.** A  $\beta$ -Linked Mannan Inhibits Adherence of *Pseudomonas aeruginosa* to Lung Epithelial Cells. (191) A. AZGHANI,\* I. WILLIAMS, D. HOLIDAY, and A. JOHNSON. Univ. of Texas Health Sci. Ctr., Tyler.
- B405.** Comparison of Voided Uroepithelial Cell and Vero Cell Assays in Measuring the Effect of Ciprofloxacin or Gentamicin on Adherence of *Pseudomonas aeruginosa*. (193) G. G. ZHANEL,\* L. E. NICOLLE, S. O. KIM, R. J. DAVIDSON, and D. J. HOBAN. Univ. of Manitoba, Winnipeg, Manitoba, Canada.
- B406.** Comparison of the Type 4 Pilin Genes of Two Strains of *Eikenella corrodens*. (195) T. TONJUM, S. WEIR,\* K. BOVRE, V. K. RAO, A. PROGULSKE-FOX, and C. MARRS. Univ. of Michigan, Ann Arbor; Rikshospitalet, Oslo, Norway; and Univ. of Florida, Gainesville.
- B407.** Lectin-Mediated Adherence of Actinomyces to Granulocytes: Variations Associated with Granulocyte Differentiation and Activation States. (197) S. RUHL,\* A. L. SANDBERG, and J. O. CISAR. NIH, Bethesda, Md.
- B408.** Bacteria within Gallstones Have P-Fimbriae and  $\alpha$ -Galactosyl Outer Membrane Structures. (199) R. HAMA-DEH,\* A. WETTER, A. OESTERLE, G. JARVIS, and L. WAY. Univ. of California, San Francisco.
- B409.** M-Selectins and Their Glycolipid Receptors: Common Microbial Cell Adhesin Molecules for the Attachment of Many Microorganisms to Host Cell Surface Receptors. (201) C. A. LINGWOOD,\* D. WOODS, and H. C. KRIVAN. Hosp. for Sick Children, Toronto, Ontario, Canada; Univ. of Calgary, Calgary, Alberta, Canada; and MicroCarb Inc., Gaithersburg, Md.
- B410.** Adherence Mechanisms of Non-O1 *Vibrio cholerae*. (203) S. SRINIVAS,\* L. J. DETOLLA, and P. PANIGRAHI. Univ. of Maryland Sch. of Med., Baltimore.
- B411.** Identification of Functional Domains on *Bordetella pertussis* Filamentous Hemagglutinin. (205) F. LEININGER,\* G. A. RENAULD, S. H. BOWEN, J. H. HANNAH, S. STIBITZ, C. LOCHT, J. G. KENIMER, and M. J. BRENNAN. Div. of Bacterial Products, Ctr. for Biologics Evaluation and Res., FDA, Bethesda, Md., and Inst. Pasteur, Lille, France.
- B412.** High-Affinity Binding of *Helicobacter pylori* to Basement Membrane Laminin. (207) K. VALKONEN, A. IJUNGH, and T. WADSTROM.\* Dept. of Biochemistry, Oulu Univ., Oulu, Finland, and Dept. of Med. Microbiol., Lund Univ., Lund, Sweden.
- B413.** Quantitative Assay for Adherence of *Helicobacter pylori*. (209) B. E. DUNN,\* C.-C. SUNG, and A. TRUSSELL. VA Med. Ctr. and Univ. of Arkansas for Med. Sci., Little Rock.
- B414.** Increased Adherence of *Branhamella catarrhalis* Associated with Respiratory Tract Infection. (211) V. HEGARTY,\* T. SCOTT, F. FALKNER, C. T. KEANE, J. B. WALSH, and D. COAKLEY. Mercer's Inst. for Res. on Ageing and Dept. of Clin. Microbiol., St. James's Hosp., Dublin, Ireland.
- B415.** Inactivation of the *Porphyromonas gingivalis* *finA* Gene by Insertion-Duplication Mutagenesis. (213) R. MALEK,\* J. FISHER, A. CALECA, M. STINSON, C. J. VAN OSS, S. LEE, M. CHO, R. J. GENCO, and D. W. DYER. SUNY at Buffalo, Buffalo, N.Y.
- B416.** *Porphyromonas gingivalis* Hemagglutinin. (215) P. CIBOROWSKI,\* R. D. ALLEN, and M. S. LANTZ. Univ. of Pittsburgh, Sch. of Dent., Pittsburgh, Pa.
- B417.** Adhesins of *Anaplasma marginale*. (217) D. J. MCGARREY,\* A. F. BARBET, and D. R. ALLRED. Col. of Vet. Med., Univ. of Florida, Gainesville.
- B418.** Flow Cytometry Studies of *Candida albicans* Attachment to Rat Vaginal Epithelium. (219) W. F. TARRY,\* S. H. SHEN, R. S. PORE, R. CHUNG, and M. A. FISHER. West Virginia Univ. Health Sci. Ctr., Morgantown.

### Session 305 (D). BACTERIAL ADHERENCE, INVASION, AND SURFACE PROTEIN EXPRESSION

- D234.** Surface Anchoring of Proteins in Gram-Positive Bacteria: a Model System. (221) O. SCHNEEWIND\* and V. A. FISCHETTI. Rockefeller Univ., New York, N.Y.
- D235.** Studies of Nonspecific Factors That Inhibit Bacterial Adherence to Normal Rabbit Cornea. (223) S. M. J. FLEISZIG,\* E. L. FLETCHER, and G. B. PIER. Brigham and Women's Hosp. and Harvard Med. Sch., Boston, Mass.
- D236.** Affinity for Porcine Respiratory Tract Mucus Is Found in Some Isolates of *Actinobacillus pleuropneumoniae*. (225) M. JACQUES,\* S. RIOUX, B. FOIRY, and M. BELANGER. Fac. Vet. Med., Univ. of Montreal, St-Hyacinthe, Quebec, Canada.
- D237.** Characterization of an Invasin Gene Locus from *Bartonella bacilliformis*. (227) A. RAJI, M. VALENZUELA, R. HOOVER, and E. MCGINNIS HILL.\* Meharry Med. Col. and Vanderbilt Univ., Nashville, Tenn.
- D238.** Immunological Specificity of HMP-1, a Major Outer Membrane Protein from *Bacteroides fragilis*. (229) C. E. GETTY\* and H. M. WEXLER. UCLA Sch. of Med. and VA Wadsworth Med. Ctr., Los Angeles, Calif.
- D239.** Adherence Characteristics of *Bifidobifla wadsworthia*. (231) S. HUNT GERARDO,\* M. M. GARCIA, and S. M. FINEGOLD. VA Wadsworth Medical Ctr. and UCLA Sch. of Med., Los Angeles, Calif., and Animal Diseases Res. Inst., Ontario, Canada.

240. Attenuated Expression in *Escherichia coli* of the Group 1 Outer Membrane Protein of *Brucella abortus* via Transposon Mutagenesis of Regions Outside the *omp1* Gene. (233) S. W. BEARDEN,\* J. K. BOWER, L. G. ADAMS, and T. A. FICHT. Texas A&M Univ./Texas Agricultural Exp. Station, College Station.
241. Genetic Variation among *Brucella* Species at the *omp2* Locus. (235) H. S. HUSSEINEN,\* S. W. BEARDEN, and T. A. FICHT. Texas A&M Univ./Texas Agricultural Exp. Station, College Station.
242. Cloning and Expression of the S-Layer Protein Gene of *Aeromonas hydrophila*. (237) M. A. AWAD\* and R. L. THUNE. Sch. of Vet. Med., Louisiana State Univ., and Louisiana Agricultural Exp. Station, Louisiana State Univ. Agricultural Ctr., Baton Rouge.
243. Cloning and Characterization of a *Haemophilus influenzae* Type b Adhesin. (239) D. L. WEINSTEIN,\* S. M. TURKOVSKI, C. F. KERRY, H. C. KRIVAN, and J. E. SAMUEL. MicroCarb Inc., Gaithersburg, Md.
244. High Degree of Conservation of Protein D Genes from Nontypeable and Type b Strains of *Haemophilus influenzae*. (241) H. JANSON,\* M. RUAN, and A. FORSGREN. Univ. of Lund, Lund, Sweden, and Malmö Gen. Hosp., Malmö, Sweden.
245. Protein D Is Not Sufficient for Immunoglobulin D Binding to *Haemophilus influenzae*. (243) K. SASAKI\* and R. S. MUNSON, JR. Connaught Ctr. for Biotechnology Res., Toronto, Ontario, Canada, and Washington Univ., St. Louis, Mo.
246. Characterization of a Chromosomal Locus Encoding a Species-Specific Cell Surface Antigen of *Listeria monocytogenes*. (245) B. W. KURZ,\* R. F. WANG, and D. D. RHOADS. Dept. of Food Sci., Arkansas Biotechnology Ctr., and Dept. of Biol. Sci., Univ. of Arkansas, Fayetteville.
247. *Escherichia coli* Adherence to Hep-2 Cells with Prefixed Cells. (247) G. M. GONZALEZ-LUGO\* and H. M. ZEPE-DA-LOPEZ. Dept. of Microbiol., Esc. Nal. Ciencias Biológicas I.P.N., Mexico D.F., Mexico.
248. Binding Structures for Enterotoxigenic *Escherichia coli* Colonization Factor Antigens in the Rabbit Intestine. (249) C. WENNERAS,\* M. M. MCCONNELL, J.-R. NEESER, and A.-M. SVENNERHOLM. Dept. of Med. Microbiol. and Immunology, Univ. of Göteborg, Göteborg, Sweden; Central Public Health Lab., Colindale, U.K.; and Nestlé Res. Ctr., Lausanne, Switzerland.
249. Comparative Adhesion of *Klebsiella pneumoniae* to Caco-2 and HEp-2 Cells: Two Different Adhesins Are Involved. (251) A. DARFEUILLE-MICHAUD,\* V. LIVRELLI, C. RICH, and B. JOLY. Faculté de Pharmacie, Clermont-Ferrand Cedex, France.
250. Isolation and Characterization of Mutants of *Pseudomonas aeruginosa* Altered in Adhesion to Epithelial Cells and Respiratory Mucin. (253) D. SIMPSON,\* R. RAMPHAL, and S. LORY. Univ. of Washington, Seattle, and Univ. of Florida, Gainesville.
251. Genetic Analysis of *Salmonella enteritidis* Attachment to HeLa Cells. (255) D. E. H. NES and A. B. GAYLE.\* Div. of Microbiol., FDA, Washington, D.C.
252. Induction in the Intracellular Environment of *Salmonella typhimurium* Genes That Respond to Low  $[Fe^{2+}]$  or  $[Mg^{2+}]$ . (257) F. GARCIA-DEL PORTILLO, J. W. FOSTER, M. E. MAGUIRE, and B. B. FINLAY.\* Univ. of British Columbia, Vancouver, British Columbia, Canada; Univ. of South Alabama, Mobile; and Case Western Reserve Univ., Cleveland, Ohio.
253. Genetic Variation of the *Salmonella ompC* Gene: OmpC Topology. (259) J. L. PUENTE, M. BOBADILLA,\* C. ARIAS, and E. CALVA. Inst. de Biotecnología/UNAM, Cuernavaca, Mor., Mexico.
- D254. Characterization of the Chromosomal *ipaH* Genes of *Shigella flexneri* Serotype 5. (261) M. M. VENKATESAN\* and J. M. BUYSSE. Walter Reed Army Inst. of Res., Washington, D.C.
- D255. Characterization of Invasion Plasmid Antigens IpaD and VirG of *Shigella flexneri* with Antisera Produced against Synthetic Peptides. (263) E. V. OAKS,\* K. R. TURBYFILL, H. COLLINS, J. MILLS, and J. BUYSSE. Walter Reed Army Inst. of Res., Washington, D.C.
- D256. Adherence Parameters Associated with *Vibrio vulnificus*. (265) B. D. TALL,\* R. L. MURPHREE, M. L. TAMPLIN, A. B. GAYLE, P. D. SINGER, and D. B. SHAH. FDA, Washington, D.C., and Univ. of Florida, Gainesville.
- D257. Molecular Analysis of Tandem, Multiple Genes Encoding 30-kDa Membrane Proteins in *Pasteurella haemolytica*. (267) G. L. MURPHY,\* L. C. WHITWORTH, and A. W. CONFER. Oklahoma State Univ., Col. of Vet. Med., Stillwater.
- D258. Interactions between *Yersinia enterocolitica* and Purified Rabbit Intestinal Mucin. (269) M. MANTLE and S. HUSAR.\* Univ. of Calgary, Calgary, Alberta, Canada.
- D259. Calcium-Binding Proteins of *Staphylococcus aureus* Mediate Adhesion to Mucin. (271) B. A. SANFORD,\* V. L. THOMAS, and M. A. RAMSAY. Univ. of Texas Health Sci. Ctr., San Antonio.
- D260. Adherence of *Staphylococcus epidermidis* to Human and Bovine Cardiac Cell Lines. (273) T. D. CHUGH,\* G. BURNS, and G. BAHR. Faculty of Med., Univ. of Kuwait, Kuwait.

### Session 306 (H). EUKARYOTIC GENES: EXPRESSION AND FUNCTIONS

- H284. Molecular Analysis of a Young-Specific Gene in the Yeast *Saccharomyces cerevisiae*. (275) N. P. D'MELLO,\* A. CHILDRRESS, and S. M. JAZWINSKI. Louisiana State Univ. Med. Ctr., New Orleans.
- H285. Prolongation of Yeast Life Span by Overexpression of the *RAS2* Gene. (277) J. SUN\* and S. M. JAZWINSKI. Louisiana State Univ. Med. Ctr., New Orleans.
- H286. A Yeast Protein Cross-Reactive with a Caldesmon Antiserum. (279) J. R. RODRIGUEZ,\* A. ROMERO, J. NEGRON, and F. CARRASQUILLO. Dept. of Biochemistry, Univ. of Puerto Rico, Med. Sci. Campus, San Juan, Puerto Rico.
- H287. Exaggerated Sphingolipid Defects in Yeast Temperature-Sensitive Lethal Mutants. (281) J. R. AZEVEDO\* and K. D. ATKINSON. Univ. of California, Riverside.
- H288. Detergent-Soluble Vitamin Rescues Temperature-Sensitive Lethal Yeast Sphingolipid Mutants. (283) T. T. TRAN,\* J. R. AZEVEDO, and K. D. ATKINSON. Univ. of California, Riverside.
- H289. Production of the CYS3 Regulator, a bZIP DNA-Binding Protein, Is Sufficient To Induce Sulfur Gene Expression in *Neurospora crassa*. (285) J. PAIETTA. Wright State Univ., Dayton, Ohio.
- H290. Analysis of the Regulated Expression of the *Neurospora crassa* Arylsulfatase Gene. (287) D. L. BAKER\* and J. V. PAIETTA. Wright State Univ., Dayton, Ohio.
- H291. Design of Improved Transformation Systems for *Ustilago violaceae*. (289) A. BANERJI,\* W. HOLMES, and M. PERLIN. Univ. of Louisville, Louisville, Ky.
- H292. Isolation and Characterization of the Genes for TFIID and  $\gamma$ -Tubulin from *Ustilago violaceae*. (291) H. LUO,\* I. WANG, and M. PERLIN. Univ. of Louisville, Louisville, Ky.

- H293.** Analysis of the S-Adenosylmethionine Synthetase Gene of *Acanthamoeba*. (293) K. S. AHN\* and H. R. HENNEY. Univ. of Houston, Houston, Tex.
- H294.** Isolation of Genes in *Leishmania donovani* by Functional Genetic Complementation. (295) K. A. RYAN, L. A. GARRAWAY,\* S. J. TURCO, and S. M. BEVERLEY. Harvard Med. Sch., Boston, Mass., and Univ. of Kentucky Med. Ctr., Lexington.
- H295.** Sequence and Expression of the Beta-Subunit of the Mitochondrial F<sub>1</sub>-ATPase in *Leishmania donovani*. (297) E. M. PETRIN\* and A. J. MUKKADA. Univ. of Cincinnati, Cincinnati, Ohio.
- H296.** Levels of a 45-kDa DNA Synthesis Inhibitor Protein in Normal and Transformed Cells. (299) G. SHANMUGAM,\* M. V. V. S. VARAPRASAD, S. SRINIVAS, and T. NAGASHUNMUGAM. Sch. of Biol. Sci., Madurai Kamaraj Univ., Madurai, India.
- H297.** Down-Regulation of p53 Protein Levels in Human Cytomegalovirus-Transformed Cells. (301) O. GAMEROS, R. BERNAL, J. CONNER, G. DELGADO, and P. MUGANDA.\* Univ. of Texas, El Paso.
- H298.** Ribavirin Affects Gene Expression in Transfected Mammalian Cells. (303) J. HARTMAN,\* J. NORTH, and B. MURRAY. Brigham Young Univ., Provo, Utah.
- H299.** Effects of DNA Methylation on Binding of the Transcription Factor CREB to the Hepatitis B Virus Enhancer. (305) R. NICHOLSON\* and J. CHRISTMAN. Michigan Cancer Fdn. and Wayne State Univ. Sch. of Med., Detroit, Mich.
- H300.** Normal and Interferon (IFN)-Resistant Cells Exhibit Different Expression Kinetics of IFN-Responsive Factor 1 and Indoleamine 2,3-Dioxygenase after IFN- $\gamma$  Treatment. (307) K. S. KIMBRO,\* J. WANG, A. YEIVIN, and M. W. TAYLOR. Dept. of Biol., Indiana Univ., Bloomington.
- H301.** Studies on Human Nuclear Factors That Bind to Damaged DNA. (309) S. KANJILAL\* and W. D. TAYLOR. Pennsylvania State Univ., University Park.
- H302.** Induction of NF- $\kappa$ B and AP-1 Related Transcription Factors by Prostaglandins. (311) D. MONDAL,\* D. ZHANG, and O. PRAKASH. Alton Ochsner Med. Fdn., New Orleans, La.
- H303.** Multifaceted Control of G Protein Expression. (313) A. CARTER,\* J. WONG, S. CASE, A. BELSCHES, F. QUAIN-TON, and S. HART. Dept. of Biochemistry, Virginia Commonwealth Univ.-Med. Col. of Virginia, Richmond.
- H304.** Studies on Transcription of the Gene for Tyrosinase, a Ubiquitous Enzyme Found in Microbes and Mammals. (315) S. HAGEN,\* N. GRANHOLM, and C. WESTBY. South Dakota State Univ., Brookings.

### Session 307 (M). CONTROL MECHANISMS OF PHAGE REPLICATION AND EXPRESSION

- M7.** Cloning and Characterization of the Replicon of the *Saccharopolyspora* Temperate Phage JHJ-3. (317) L. R. GAUDREAU\* and C. V. DERY. Univ. de Sherbrooke, Sherbrooke, Quebec, Canada.
- M8.** Cloning and Characterization of Promoters from the *Saccharopolyspora* Phage JHJ-1. (319) J.-L. PARENT, D. DESMARAIS, B. GAMACHE, R. BRZEZINSKI, and C. V. DERY.\* Univ. de Sherbrooke, Sherbrooke, Quebec, Canada.
- M9.** Transposon and Deletion Analysis of the *cos* Region of *Pseudomonas aeruginosa* Phage D3. (321) R. SHARP\* and A. M. KROPINSKI. Queen's Univ., Kingston, Ontario, Canada.
- M10.** Terminal Sequences: Their Role in RNA Replication. (323) D. Y. ZHANG\* and F. R. KRAMER. NYU Sch. of Med., New York, N.Y.

- M11.** System for Studying the Effects of Low-Usage Codons on Gene Expression in *Escherichia coli*. (325) E. GOLDMAN,\* A. H. ROSENBERG, J. J. DUNN, F. W. STUDIER, and G. ZUBAY. New Jersey Med. Sch., Newark; Brookhaven Nat. Lab., Upton, N.Y.; and Columbia Univ., New York, N.Y.

### Session 308 (O). FEED- AND FOOD-RELATED PRODUCTS AND MICROORGANISMS

- O70.** Studies on a New *Rhodotorula rubra* Strain. (327) R. HARI,\* T. PATEL, and A. MARTIN. Mem. Univ. of Newfoundland, St. John's, Newfoundland, Canada.
- O71.** Production of Astaxanthin by the Green Microalga *Chlorella zofingiensis*. (329) H. J. NELIS\* and A. P. DE LEENHEER. Univ. of Gent, Gent, Belgium.
- O72.** Protoplast Fusion of L-Lysine-Producing Strains from *Brevibacterium divaricatum*. (331) J.-H. HUANG,\* M.-H. LU, S.-C. TSAO, and Y.-C. SU. Dept. of Agricultural Chemistry, Nat. Taiwan Univ., Taipei, Taiwan, Republic of China.
- O73.** Cloning, Sequence, and Expression of the *Lactococcus lactis* NCDO2054 *lacZ* Gene. (333) R. D. PRIDMORE,\* M. RICHARD, B. MOLLET, and H. HOTTINGER. NESTEC Ltd., Lausanne, Switzerland.
- O74.** Cloning and Analysis of the Bacteriophage Abortive Infection Genetic Determinants of Plasmid pBF61 from *Lactococcus lactis* subsp. *lactis* KR5. (335) L. A. MCLANDSBOROUGH,\* K. M. KOLAETIS, and L. L. MCKAY. Dept. of Food Sci. and Nutrition, Univ. of Minnesota, St. Paul.
- O75.** Identification of Industrial and Isogenic Strains of *Streptococcus thermophilus* by Pulsed-Field Gel Electrophoresis. (337) C. TARIEL, L. BENBADIS,\* and D. L. HARTLEY. Internat. Ctr. of Res. Daniel Carasso, Le Plessis Robinson, France.
- O76.** Batch Culture of *Enterococcus hirae* To Produce Bacteriocin Inhibitory to *Listeria* Species. (339) G. R. SIRAGUSA. USDA-Agricultural Res. Service, Roman L. Hruska U.S. Meat Animal Res. Ctr., Clay Center, Nebr.
- O77.** Monoclonal Antibody-Immunoassay Blot To Isolate Bacteriocin-Producing *Pediococcus* Species. (341) A. K. BHUNIA,\* L. BLY, S. PUDLAS, and M. PENNEY. Dept. of Food Sci. and A. Kansas Biotechnology Ctr., Univ. of Arkansas, Fayetteville.
- O78.** Defined Medium for Metabolic Differentiation of *Listeria monocytogenes* and *Lactobacillus plantarum* in Competitive Fermentations. (343) T. L. ROMICK,\* H. P. FLEMING, and R. F. MCFEETERS. USDA, Agricultural Res. Service, and Dept. of Food Sci., North Carolina State Univ., Raleigh.
- O79.** Competitive Growth of Malolactic-Deficient *Lactobacillus plantarum* in Cucumber Fermentations. (345) F. BREIDT\* and H. P. FLEMING. USDA, Agricultural Res. Service, and Dept. of Food Sci., North Carolina State Univ., Raleigh.
- O80.** Characterization of a Propionic Acid-Producing Bacterium Isolated from Ensiled High-Moisture Corn. (347) T. E. DAWSON,\* S. R. RUST, and M. T. YOKOYAMA. Michigan State Univ., East Lansing.
- O81.** Low pH and Lactate Are Necessary for Conversion of Prepediocin to Active Pediocin AcH in *Pediococcus acidilactici* H. (349) M. C. JOHNSON,\* M. B. HANLIN, and B. RAY. Univ. of Wyoming, Laramie.
- O82.** Fermentation of Raffinose and Stachyose by Bacteria from the Hindgut of Weaned Pigs. (351) D. KRAUSE,\* R. EASTER, and R. MACKIE. Univ. of Illinois, Urbana.
- O83.** Production of Low-Molecular-Weight Dextran Polymers by Fermentation with *Leuconostoc mesenteroides* and *Lipo-*

- myces starkeyi*. (353) D. KIM\* and D. F. DAY. Dept. of Microbiol. and Audubon Sugar Inst., Louisiana State Univ., Baton Rouge.
384. Cloning and Sequencing of *xps2A* Gene Involved in Xanthan Polysaccharide Synthesis of *Xanthomonas campestris*. (355) H.-C. CHOU, B.-Y. YANG, and Y.-H. TSENG.\* Nat. Chung Hsing Univ., Taichung, Taiwan, Republic of China.
385. Effect of Temperature upon Pullulan Production Relative to Carbon Source Present. (357) T. P. WEST\* and B. REED-HAMER. South Dakota State Univ., Brookings.
386. Intracellular Lipid and Extracellular Dextranase Made by Chemostat-Grown *Lipomyces starkeyi*. (359) A.-M. BLAKE,\* D. DONZE, T. WINN, D. KIM, J. MAYO, and D. DAY. Louisiana State Univ. Med. Ctr., New Orleans, and Louisiana State Univ. Agricultural Ctr., Baton Rouge.
387. Fermentation of Lactose by *Apiotrichium curvatum* ATCC 20509. (361) R. PAREKH and R. I. MACKIE.\* Dept. of Animal Sci., Univ. of Illinois, Urbana.
388. Solid-State Fermentation Products Made from Cereal Grains. (363) K. A. HACHMEISTER. Kansas State Univ., Manhattan.

## POSTER SESSIONS

Saturday, 3:00-4:30 P.M., Exhibit Hall C

(Board numbers in parentheses)

### Session 309 (C). SERODIAGNOSIS II

3426. Comparison of the Indirect Fluorescent Antibody Test versus a Rapid Enzyme Immunoassay for Detection of Measles Immunoglobulin G Antibodies. (002) M. CHRISTENSEN\* and R. GOLDMAN. Children's Mem. Hosp. of Northwestern Univ. Med. Ctr., Chicago, Ill.
3427. Evaluation of Dried Blood Spots as a Specimen for Measles Antibody Status Determination in Outbreak Control. (004) F. P. DOWNES,\* P. CLARK, R. NOWAK, and B. BERLIN. Michigan Dept. of Publ. Health and Central Michigan Health Dept., Lansing.
3428. Rapid, Fully Automated Enzyme-Linked Immunofluorescent Assay for Measles (Rubeola) Immunoglobulin G Antibody. (006) T. MCGOVERN,\* N. FAZAL, and B. HAMMOND. BioMerieux Vitek, Inc. Rockland, Mass., and Hazelwood, Mo.
3429. Comparison of Diamedix Enzyme Immunoassay with Indirect Immunofluorescence for Detection of Varicella and Measles Antibodies. (008) D. S. LELAND, K. A. BARTH, S. E. COLLINS,\* and L. E. SUTER. Indiana Univ. Med. Ctr., Indianapolis.
3430. Rapid, Fully Automated Immunofluorescent Assay for the Detection of Immunoglobulin G Antibodies to Varicella-Zoster Virus. (010) J. THURSTON,\* S. LARSEN, and A. BUERK. BioMerieux Vitek, Inc. Rockland, Mass., and Hazelwood, Mo.
3431. Evaluation of VZVscan Detection of Immunoglobulin G Antibodies to Varicella-Zoster Virus. (012) D. JONES\* and A. MATERS. Johns Hopkins Med. Inst., Baltimore, Md.
3432. Antibodies to *Bordetella pertussis* Adenylate Cyclase Toxin in Neonatal Sera. (014) J. L. ARCINIEGA,\* E. L. HEWLETT, K. M. EDWARDS, and B. D. MEADE. FDA, Bethesda, Md.; Univ. of Virginia, Charlottesville; and Vanderbilt Univ., Nashville, Tenn.
3433. Positive or False-Positive Enzyme Immunoassay in Lyme Disease: a Use for Western Blot? (016) A. M. ADAMS,\* K. G. BEAVIS, and I. RUTHERFORD. Cleveland Clin. Fndn., Cleveland, Ohio.
- C434. Serodiagnostics of Lyme Disease Infection by Whole Lysate and Recombinant-Based Western Blot. (018) G. L. NORMAN,\* R. B. LEFEBVRE, D. J. CAUGHEY, and W. R. HOGREFE. Microbiol. Reference Lab., Cypress, Calif., and Univ. of California, Davis.
- C435. Western Blot Analysis Using Sera from Patients Diagnosed with Human Ehrlichiosis. (020) J. DAWSON\* and C. GREENE. Div. of Viral and Rickettsial Diseases, CDC, Atlanta, Ga.
- C436. Rapid Test Developed for Detection of *Helicobacter* Antibodies. (022) G. ANDERSON,\* M. M. ALEMOHAMMAD, T. J. FOLEY, C. P. DOOLEY, A. PATEL, and A. COLLETTI. Hycor Biomed. Inc., Garden Grove, Calif., and Los Angeles County USC Med. Ctr., Los Angeles, Calif.
- C437. Evaluation of Pyloriset Latex Agglutination Test for Detection of Antibodies to *Helicobacter pylori*. (024) C. GRANBERG, V.-M. HAIVA,\* H. NURMI, M.-R. STAHLBERG, O.-P. LEHTONEN, A. MANSIKKA, H. KUJARI, R. GRONFORS, and I. RAIHA. Orion Diagnostica, Espoo, Finland, and Dept. of Med., Dept. of Pediatrics, and Dept. of Microbiol., Turku Univ. Central Hosp., Dept. of Med. Microbiol. and Dept. of Pathology, Turku Univ., Hospital of Turunmaa, and Turku City Hosp., Turku, Finland.
- C438. Humoral Immune Response against *Helicobacter pylori* in Children. (026) L. P. ANDERSEN,\* V. WEWER, M. TVEDE, K. CHRISTIANSEN, J. H. HANSEN, F. HENRIKSEN, and P. A. KRASILNIKOFF. Rigshospitalet, Copenhagen, Denmark, and Univ. Hosp., Gentofte, Denmark.
- C439. Evaluation of a New Complement-Fixation Test for Detection of *Helicobacter pylori* Infection. (028) H. GOOSSENS,\* Y. GLUPCZYNSKI, C. VAN DEN BORRE, A. BURETTE, A. KELLER, J. WILHELM, and J.-P. BUTZLER. WHO Collaborating Ctr. for Enteric Campylobacter, Brugmann Univ. Hosp., Nouv. Clin. Basilique, Brussels, Belgium, and Inst. Virion, Ruschlikon, Zurich, Switzerland.
- C440. Dose-Response Evaluation by Enzyme Immunoassay and Immunoblot of Individuals Seropositive and Seronegative to *Helicobacter pylori*. (030) S. PASKELL. Washington Biotechnology, Seattle.
- C441. Comparison of Methods for the Detection of *Mycoplasma pneumoniae* Antibody. (032) N. SMITH, K. BUCHANAN, and R. C. TILTON.\* North American Lab. Group, New Britain, Conn.
- C442. Evaluation of an Immunoassay for the Serological Diagnosis of *Toxocara* in Humans. (034) L. SLOAN,\* J. ROSENBLATT, and I. KAGAN. Mayo Clin., Rochester, Minn., and Parasitic Disease Consultants, Tucker, Ga.
- C443. Comparison of Two Automated Methods for Measurement of *Toxoplasma gondii* Antibodies. (036) I. KWASNIK,\* J. BARRY, C. BRINKMAN, and R. W. RYAN. Univ. of Connecticut School of Med., Farmington, and Connecticut State Dept. of Health Services.
- C444. Detection and Quantitation of Immunoglobulin G (IgG) and IgM Antibodies Specific for *Toxoplasma gondii* Using New Enzyme-Linked Immunoassay Methods. (038) R. STEINHAUSER,\* L. MCCLAIN, B. MARTENS-DURING, T. BUCK, H. D. DOPATKA, and R. ZIEGELMAIER. Behring Diagnostics Inc., Somerville, N.J., and Behringwerke AG, Marburg, Germany.
- C445. Evaluation of Six Commercially Available Toxoplasma Serology Kits. (040) K. KOWALEWSKA,\* I. PERRY, D. BULAWKA, and E. PRASAD. Provincial Lab. of Publ. Health for Northern Alberta, Edmonton, Alberta, Canada.
- C446. Diagnostic Evaluation of Neurosyphilis in Human Immunodeficiency Virus-Infected Persons by Using a TPHA Index and Cerebrospinal Fluid Western Blot. (042) P. HOLTOM.\*



R. LARSEN, J. OWEN, and R. BYRNE. Los Angeles County-USC Med. Ctr., Los Angeles, Calif., and Baxter Diagnostics Inc., Mundelein, Ill.

### Session 310 (C). FASTIDIOUS AND UNUSUAL PATHOGENS: CULTURE, DETECTION, AND CHARACTERIZATION

- C447. Determination of Cellular Fatty Acid Composition of *Aeromonas jandaei* and *Aeromonas trota*. (044) R. L. GHERNA,\* W. LANDRY, A. M. CARNAHAN, and S. JOSEPH. American Type Culture Collection, Rockville, Md.; FDA, Dallas, Tex.; Anne Arundel Med. Ctr., Annapolis, Md.; and Univ. of Maryland, College Park.
- C448. HeLa Cell Culture System for Isolation of *Afipia felis* (the Cat Scratch Disease Bacillus). (046) K. A. BIRKNES\* and F. D. QUINN. CDC, Atlanta, Ga.
- C449. Production and Characterization of Monoclonal and Polyclonal Antibody to *Afipia felis* sp. nov., the Proposed Etiologic Agent of Cat Scratch Disease. (048) S. JOHNSON, S. HUNTER,\* W. DEWITT, L. HELSEL, W. BIBB, and B. SWAMINATHAN. CDC, Atlanta, Ga.
- C450. Comparison of Two Sets of Primers for the Detection of *Bordetella pertussis* in Clinical Specimens by the Polymerase Chain Reaction. (050) L. M. MANN,\* J. L. DEEN, and E. A. WAGAR. UCLA Med. Ctr., Los Angeles, Calif.
- C451. Increased Yield of *Bordetella* on Prolonged Incubation and Repeat Subculture of Specific Transport Medium. (052) K. KNOWLES\* and S. SORGER. Montreal Children's Hosp., McGill Univ., Montreal, Quebec, Canada.
- C452. Comparison of Three Sample Preparation Methods for Detection of *Borrelia burgdorferi* in Blood by Polymerase Chain Reaction. (054) P. H. LOUIE,\* K. LE GASSIC, R. MADEJ, and D. E. DODGE. Roche Molecular Systems, Alameda, Calif.
- C453. Characterization of *Centipeda periodontii* by Sodium Dodecyl Sulfate-Polyacrylamide Gel Electrophoresis and Immunoblotting. (056) E. SAUVETRE,\* Y. GLUPCZYNSKI, M. LABBE, S. GOUTIER, E. YOURASSOWSKY, and M. POURTOIS. Dept. of Microbiol., Brugmann Univ. Hosp., Brussels, Belgium.
- C454. Indirect Fluorescent Antibody Identification of the Microsporidian *Enterocytozoon bieneusi* in Clinical Samples Using Antisera to *Encephalitozoon cuniculi* and *Encephalitozoon hellem*. (058) C. H. ZIERDT\* and W. S. ZIERDT. NIH, Bethesda, Md.
- C455. Culturing of *Haemophilus ducreyi* in New York from 1985 to 1991. (060) Y. C. FAUR and G. WILLIAMS.\* New York City Dept. of Health, New York, N.Y.
- C456. Isolation of *Nocardia asteroides* from Respiratory Specimens by Using Buffered Charcoal Yeast Extract Agar. (062) E. KERR,\* H. SNELL, B. L. BLACK, M. STOREY, and W. D. COLBY. Univ. Hosp., London, Ontario, Canada.
- C457. Detection of Subclinical Piroplasmiasis in Baboons (*Papio* sp.) by Immunofluorescent Assay. (064) M. A. BRONSDON,\* T. R. FRITSCH, R. G. ANDREWS, and J. T. BIELITZKI. Univ. of Washington and Fred Hutchinson Cancer Res. Ctr., Seattle, Wash.
- C458. Improved Identification of *Pneumocystis carinii* from Induced Sputa following Cultivation in A549 Cells. (066) A. SHAHIDI,\* R. ORTIZ, and J. ESPINOZA. VA Med. Ctr., Bronx, N.Y.
- C459. Sensitivity of Induced Sputum Specimens in Diagnosis of *Pneumocystis carinii* Infections in a Low Human Immunodeficiency Virus Prevalence Tertiary Care Center. (068) M. D.

LINDSLEY,\* F. R. COCKERILL III, and T. F. SMITH. Clin. Microbiol., Mayo Clin., Rochester, Minn.

- C460. Cellular Fatty Acid Composition and Characterization of the  $\beta$ -Lactamase of *Rahnella aquatilis*. (070) D. KING,\* A. MAHON, and J. D. DICK. Johns Hopkins Med. Inst., Baltimore, Md.
- C461. Isolation and Identification of *Rhodococcus* Species from Blood and Catheter Tip Cultures. (072) C. HINNEBUSCH,\* D. GLENN, and P. COLONNA. UCLA Med. Ctr., Los Angeles, Calif.
- C462. Defining and Determining Acid-Fast Characteristics of *Rhodococcus equi*. (074) K. GIDEON,\* E. BANNISER, A. GATSON, J. SPRING, and P. RAJ. Dept. of Pathology, Univ. of Texas Med. Branch, Galveston.
- C463. Amplification and Restriction Endonuclease Analysis of the rDNA 16S-23S Spacer Region from *Rochalimaea* Species. (076) G. M. MATAR, B. SWAMINATHAN,\* L. N. SLATER, and D. F. WELCH. CDC, Atlanta, Ga., and Univ. of Oklahoma, Health Sci. Ctr., Oklahoma City.
- C464. Isolation and Identification of *Rochalimaea henselae* from Human Tissue. (078) M. GARCIA, J. E. PETERS,\* M. J. DOLAN, and D. V. BRADLEY. Wilford Hall U.S. Air Force Med. Ctr., Lackland Air Force Base, Tex.
- C465. Potential Misidentification of *Staphylococcus* Species when Using Rapid Identification Tests That Detect Clumping Factor. (080) C. HINNEBUSCH,\* D. GLENN, and D. A. BRUCKNER. UCLA Med. Ctr., Los Angeles, Calif.
- C466. Isolation and Identification of an Uncommon Pathogen, *Staphylococcus lugdunensis*, from a Femoral Graft. (082) D. GLENN,\* C. HINNEBUSCH, and P. COLONNA. UCLA Med. Ctr., Los Angeles, Calif.
- C467. Coryneform-Type Gram-Positive Rods: Emerging Pathogens Difficult To Identify in the Clinical Microbiology Laboratory. (084) J. A. ROBLEDO,\* G. I. MEJIA, M. C. TAMAYO, and H. TRUJILLO. Corp. para Investigaciones Biol., Hosp. Pablo Tobón Uribe, Medellín, Colombia.

### Session 311 (I). APPLIED MICROBIOLOGY

- I84. Genetic Population Structure of *Escherichia coli* from Children in Rural Villages of Mexico. (086) S. AKE\* and T. S. WHITTAM. Dept. of Biol., Pennsylvania State Univ., University Park.
- I85. Effect of the Composition of Three Culture Media on the Chromatographic Profile of the Cellular Fatty Acids of *Klebsiella oxytoca*. (088) V. RIVERA,\* S. FLORES, E. ROBLES, G. SAINZ, and P. RAMIREZ. ENEP Iztacala, UNAM, Mexico.
- I86. Comparison of In Vivo and In Vitro Growth Rates for *Lactobacillus acidophilus*. (090) T. AWERBUCH,\* A. GESHNIZGANI, R. ROSS, and A. ONDERDONK. Harvard Sch. of Publ. Health, Channing Lab., Harvard Med. Sch., and Brigham and Women's Hosp., Boston, Mass.
- I87. Pulsed-Field Gel Electrophoresis Analysis of Lactobacilli from Chickens Fed a Commercial Microbial Product. (092) S. WOSKOW\* and T. REHBERGER. Far-Mor Biochemical Co., Milwaukee, Wis., and Oklahoma State Univ., Stillwater.
- I88. Analysis of Hemolytic Group B *Streptococcus* Serogroup Ia/c Causing Spontaneous Infections in Mice. (094) J. ELLIOTT,\* M. GOELZ, J. THIGPEN, J. LOCKLEAR, W. STOKES, and R. FACKLAM. CDC, Atlanta, Ga., and Nat. Inst. of Environmental Health Sci., Research Triangle Park, N.C.
- I89. Molecular Analysis of Multiple Isolates of the Major Serotypes of Group B Streptococci. (096) E. FASOLA,\* C. LIVDAHL, and P. FERRIERI. Univ. of Minnesota Med. Sch. and Hosp., Minneapolis.

- 190.** Antagonistic Activity of Lactic Acid Bacteria and Food-borne Pathogens. (098) V. E. CHANDLER\* and K. E. NEWMAN. Alltech Biotechnology Ctr., Nicholasville, Kentucky.
- 191.** Isolation of a Cellulolytic *Clostridium* sp. from the Pig Intestinal Tract Is Not Dependent on Feeding *Clostridium longisporum*. (100) V. H. VAREL,\* J. T. YEN, and K. L. ANDERSON. USDA, Agricultural Res. Service, U.S. Meat Animal Res. Ctr., Clay Center, Nebr.
- 192.** Effect of a Calcium Alginate Dressing (Sorbsan) on the Multiplication of Bacterial Pathogens In Vitro. (102) A. CAZZANIGA,\* D. MARSHALL, and P. MERTZ. Univ. of Miami Sch. of Med., Miami, Fla.
- 193.** Effect of Inoculum Preparation on the Susceptibility of *Serratia marcescens* to Contact Lens Disinfectants. (104) D. RUPP,\* M. TOTARO, S. KAPADIA, and C. ANGER. Allergan Res. Microbiol., Allergan, Inc., Irvine, Calif.
- 194.** Survival and Persistence of Microbial Challenges on Premoistened Pads of Nonpreserved and Preserved Cosmetic Cleansing Formulations. (106) P. LO,\* C. ANGER, S. DING, and S. KAPADIA. Allergan Inc., Irvine, Calif.
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- H316.** Binding of Cyclic AMP Receptor Protein to the *pckA* Gene of *Escherichia coli*. (138) H. GOLDIE\* and M. H. SAIER, JR. Univ. of Saskatchewan, Saskatoon, Saskatchewan, Canada, and Univ. of California, San Diego.
- H317.** Determination of Protein-DNA Interactions in the Transcriptional Control of the *proU* Operon of *Salmonella typhimurium*. (140) A. G. MATHEW,\* M. M. EDERER, L. N. CSONKA, and N. P. HIGGINS. Purdue Univ., West Lafayette, Ind.; Univ. of Idaho, Moscow; and Univ. of Alabama, Birmingham.
- H318.** Genetic Dissection of DNA Binding and *lux* Gene Activating Functions of the *Vibrio fischeri* LuxR protein. (142) S. H. CHOI\* and E. P. GREENBERG. Univ. of Iowa, Iowa City.
- H319.** Characterization of the DNA-Melting Function of the *Rickettsia prowazekii* RNA Polymerase. (144) H.-F. DING\* and H. H. WINKLER. Lab. of Molecular Biol., Univ. of South Alabama Col. of Med., Mobile.
- H320.** *trans*-Activation of Gene Expression. (146) S. YE,\* T. SOM, and E. B. KMIEC. Jefferson Univ. Sch. of Med., Philadelphia, Pa.
- H321.** Organization of the Bacterial Genome: Role of H-NS. (148) V. MCGOVERN,\* A. JAWORSKI, and N. P. HIGGINS. Dept. of Biochemistry, Univ. of Alabama, Birmingham.

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- H306.** Negative Regulation of the *Escherichia coli* Glycine Cleavage Enzyme System by the *purR* Gene Product. (118) R. WILSON,\* M. URBANOWSKI, and G. STAUFFER. Univ. of Iowa, Iowa City.
- H307.** Role of the CynR Activator Protein in the Regulation of the Divergent *Escherichia coli* *cyn* Operon Involved in Cyanate Detoxification. (120) A.-F. J. LAMBLIN\* and J. FUCHS. Dept. of Biochemistry, Univ. of Minnesota, St. Paul.
- H308.** Molecular Interaction of *Escherichia coli* Biotin Repressor-Operator Complex. (122) K.-C. LIN and D. SHIUAN.\* Dept. of Biological Sci., Nat. Sun Yat-Sen Univ., Kuohsiung, Taiwan, Republic of China.
- H309.** Transcriptional Regulation of *algC* Encoding Phosphomutase in Alginate-Producing Strains of *Pseudomonas aeruginosa*. (124) N. A. ZIELINSKI,\* R. MAHARAJ, C. DANGANAN, W. HENDRICKSON, and A. M. CHAKRABARTY. Univ. of Illinois, Chicago.
- H310.** Identification of *sodA* Sequence-Specific DNA-Binding Proteins in *Escherichia coli*. (126) D. G. PRESUTTI. North Carolina State Univ., Raleigh.
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- D261.** Synergism between Electrical Fields (Current) and Antibiotics in the Eradication of Biofilms. (150) B. D. ELLIS,\* J. W. COSTERTON, and A. E. KHOURY. Dept. of Biol., Univ. of Calgary, Calgary, Alberta, Canada, and Dept. of Urology, Sick Children's Hosp., Toronto, Ontario, Canada.
- D262.** Bacterial Colonization of Urinary Catheters in Model Laboratory Systems. (152) S. OPPENHEIMER,\* V. WILLIAMS, and M. FLETCHER. Ctr. of Marine Biotechnology, Univ. of Maryland, Baltimore.
- D263.** Inhibitory Effects of Silver-Treated Catheters on Growth and Adherence of Bacteria. (154) M. M. GABRIEL,\* A. D. SAWANT, M. S. MAYO, R. B. SIMMONS, and D. G. AHEARN. Georgia State Univ., Atlanta.
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- D265.** Influence of Growth Rate and Formation of Biofilm upon the Cell Surface Charge of *Escherichia coli*. (158) S. A. MAKIN,\* S. GANDER, M. R. W. BROWN, and P.

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- D266.** Colonization of Silastic Rubber by *Pseudomonas fluorescens* and *Pseudomonas putida* Using a Chemostat and a Modified Robbins Device. (160) J. JASS,\* E. V. SHARF, and H. M. LAPPIN-SCOTT. Univ. of Exeter, Exeter, England.
- D267.** Alginate Expression in Biofilm and Planktonic *Pseudomonas aeruginosa*. (162) H. YU,\* M. F. HYNES, S. D. FRASER, and H. ANWAR. Dept. of Biol. Sci., Univ. of Calgary, Calgary, Alberta, Canada, and Dept. of Microbiol., Univ. of Alberta, Edmonton, Alberta, Canada.
- D268.** Adhesion of *Vibrio cholerae* O1 Strains to Hydrophobic Polystyrene Is Not Dependent on the Toxin Coregulated Pilus but May Be Dependent on ToxR. (164) M. O. WALDERHAUG. FDA, Washington, D.C.
- D269.** Adhesion of *Enterococcus faecium* L-Forms to Silastic Rubber. (166) H. M. LAPPIN-SCOTT,\* J. JASS, L. E. PHILLIPS, and E. J. ALLAN. Univ. of Exeter, Exeter, England, and Univ. of Aberdeen, Aberdeen, Scotland.
- D270.** Impact on Staphylococcal Adherence of Antibiotic Bonding to Cardiothoracic Implantable Biomaterials. (168) D. UYENO,\* C. E. EDMISTON, H. ALMASSI, C. KREPEL, C. GOHR, and G. OLINGER. Dept. of Gen. and Cardiovascular Surgery, Med. Col. of Wisconsin, Milwaukee.
- D271.** Adhesion and Biofilm-Forming Ability of a Hydrophilic and Hydrophobic Variant of *Staphylococcus epidermidis* NCTC 11047. (170) P. S. HANDLEY\* and J. CUNNIFFE. Manchester Univ., Manchester, U.K.
- D272.** *Staphylococcus epidermidis*-Platelet Interactions in Prosthetic Device-Centered Infections. (172) J. M. LOUTSCH,\* T. W. MILLIGAN, J. BYRNE, J. E. BAUMAN, and J. H. JOIST. Dept. of Pathology and Internal Med., St. Louis Univ. Med. Ctr., St. Louis, Mo.
- D273.** Adherence of *Staphylococcus epidermidis* to Surgical Biomaterials and Cortical Bone: Comparison between Live and Killed Bacteria. (174) S. GORDON,\* D. JENNINGS, L. PEARSON, and L. WEBB. Bowman Gray Sch. of Med., Winston-Salem, N. C.

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- D275.** Construction of Chimeric Genes To Map a Surface-Exposed Epitope on the Pilus of Nontypeable *Haemophilus influenzae* M37. (178) K. PALMER\* and R. S. MUNSON, JR. Washington Univ., St. Louis, Mo.
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- D277.** Invariant Cleft Residue of PapD Is Essential in Binding and Maintaining Pilus Subunits in Assembly-Competent Conformations. (182) L. N. SLONIM,\* M. J. KUEHN, J. S. PINKNER, C. I. BRANDEN, and S. J. HULTGREN. Washington Univ. Sch. of Med., St. Louis, Mo.
- D278.** Cloning and Sequencing of the Minor Tip Component Genes of *pap-3* Pili of *Escherichia coli*. (184) A. KLANN,\* R. HULL, and S. HULL. Baylor Col. of Med., Houston, Tex.
- D279.** P Pili in Uropathogenic *Escherichia coli* Are Composite Fibers with Distinct Fibrillar Adhesive Tips. (186) M. J.

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- D280.** Plasmid-Encoded Fimbrial Gene of Enteropathogenic *Escherichia coli* Associated with Localized Adherence (188) M. S. DONNENBERG,\* J. A. GIRON, G. K. SCHOOLNIK, and J. B. KAPER. Univ. of Maryland Sch. of Med., Baltimore, and Stanford Univ., Stanford, Calif.
- D281.** New Fimbrial Putative Colonization Factor on Human Enterotoxigenic *Escherichia coli*. (190) G. YIBOUD,\* N. BINSZTEIN, M. JOUVE, and A.-M. SVENNERHOLM. Dept. Med. Microbiol. and Immunology, Gothenburg, Sweden, and Inst. Nacional Microbiol. "C. G. Malbran," Buenos Aires, Argentina.
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- D283.** Distribution of the Bundle-Forming Pilus (*bfp*) Gene among Enteropathogenic *Escherichia coli*. (194) J. A. GIRON,\* K. G. GICQUELAIS, and M. S. DONNENBERG. Ctr. for Vaccine Development, Univ. of Maryland, Baltimore.
- D284.** Expression of the *Salmonella typhimurium fimA* Gene Is Affected by Two Ancillary *fim* Determinants Located Downstream of *fimA*. (196) D. SWENSON\* and S. CLEGG. Univ. of Iowa, Iowa City.
- D285.** Characterization of Pili Expression and Type 1 Pili Genes from *Shigella flexneri*. (198) N. J. SNELLINGS,\* B. TALL, and M. M. VENKATESAN. Walter Reed Army Inst. of Res. and Div. of Microbiol., FDA, Washington, D.C.
- D286.** Effect of Culture Agitation on *Pseudomonas aeruginosa* 1244 Piliation. (200) P. CASTRIC. Duquesne Univ., Pittsburgh, Pa.
- D287.** Discrepancies between Type 1 Fimbriation Phase and the Orientation of the *fim* Invertible Element in Integration Host Factor Mutants of *Escherichia coli*. (202) J. PRINC,\* I. C. BLOMFIELD, P. CALIE, and B. I. EISENSTEIN. Univ. of Michigan, Ann Arbor.
- D288.** Targeting of Chaperone-Subunit Complexes to the Outer Membrane Protein PapC in P Pili Biogenesis. (204) K. W. DODSON\* and S. J. HULTGREN. Washington Univ. Med. Sch., St. Louis, Mo.

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- Q342.** Comparison of Neutralizing Diluents Using Conductance Microbiology on the Recovery of Microorganisms from Personal Care Products. (210) F. MARLATT\* and J. LORBACH. Radiometer America Inc., Westlake, Ohio.
- Q343.** New Standard for Sterility Testing of Autoclaved Surgical Trays. (212) A. F. WIDMER,\* A. HOUSTON, F. BOLLINGER, and R. P. WENZEL. Univ. of Iowa, Iowa City.
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- Q345.** Survival of Adhered Microorganisms Exposed to Rigid Gas-Permeable Contact Lens Solutions. (216) L. L. MAY, P. A. GANDHI,\* A. D. SAWANT, L. A. WILSON, and D. G. AHEARN. Georgia State Univ., Atlanta.
- Q346.** Improved Detection of Heated *Bacillus stearothermophilus* Spores Using Modified Fluid Thioglycolate and Soybean Casein Digest Broths. (218) K. KALLANDER,\* J. ROMER, and J. SOFOS. FDA, Denver, Colo., and Colorado State Univ., Fort Collins.
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- Q349.** Antimicrobial Activity of Environmentally "Green" Products. (224) J. RUBINO\* and J. BAUER. L&F Products, Montvale, N.J.
- Q350.** Adequacy of Preservation of Cosmetics: Chemical and Microbiological Testings. (226) T. T. TRAN,\* L. B. KOOPMAN, and F. J. HURLEY. FDA, Washington, D.C.
- Q351.** Evaluation of Disinfectant Neutralizers Shows That Not All Are Effective. (228) S. R. RACHUI,\* S. V. W. SUTTON, and D. K. BRANNAN. Abilene Christian Univ., Abilene, Tex., and Bausch & Lomb, Rochester, N.Y.
- Q352.** Improved Neutralization Recovery System for Hydrogen Peroxide Testing. (230) D. W. PROUD,\* L. J. B. WHITEMAN, and S. V. W. SUTTON. Bausch & Lomb, Rochester, N.Y.
- Q353.** New Methods for Inactivation of Preservatives and Antibiotics in Pharmaceutical Products. (232) D. RUPP,\* M. TOTARO, S. KAPADIA, and C. ANGER. Allergan Labs, Irvine, Calif.
- Q354.** Demonstration of In Vitro Bactericidal Activity of Cellophane Films by the Direct Contact Plate Method. (234) K. JIM and J. BARBATO \* Massachusetts Col. of Pharmacy, Boston.
- Q355.** In Vitro Bactericidal Activity of Novel Polyester Fabrics by the Direct Contact Method. (236) K. JIM and J. BARBATO.\* Massachusetts Col. of Pharmacy, Boston.
- Q356.** Microbial Spectrum of Activity of Chitosan. (238) N. A. KLAPES\* and N. G. MCCORMICK. North Carolina State Univ., Raleigh, and U.S. Army Natick Res., Development and Engineering Ctr., Natick, Mass.
- Q357.** Fate of Selected Bacterial Pathogens and Indicators and Enteric Viruses in Fractionated Poultry Litter during Storage. (240) T. KELLEY,\* O. PANCORBO, W. MERKA, S. THOMPSON, M. CABRERA, and H. BARNHART. Univ. of Georgia, Athens.
- Q358.** Studies on Survival and Growth of *Salmonella* in Farm-Simulated Laboratory Microcosms. (242) S. W. JOSEPH, O. OPARA,\* L. CARR, E. T. MALLINSON, and L. STEWART. Univ. of Maryland, College Park.
- Q359.** Salmonellosis in Beef Cattle. (244) N. E. WOOLLEN,\* E. K. DANIELS, and E. T. LITTLEDIKE. USDA, Agricultural Res. Service, U.S. Meat Animal Res. Ctr., Clay Center, Nebr.
- Q360.** Clearance and Pulmonary Inflammatory Response in C3H/HeJ Mice Exposed Intranasally to Biotechnology Agents. (246) S. E. GEORGE,\* M. J. KOHAN, M. S. TAYLOR, H. G. BROOKS, M. I. GILMOUR, and L. D. CLAXTON. U.S. EPA-HERL and EHRT, Inc., Research

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- Q362.** Relative Abundance and Composition of Fungi Associated with On-Farm Stored Corn in Western Kentucky: Results of a 2-Year Survey. (250) B. D. PRICE,\* J. D. SEDLACEK, and P. A. WESTON. Kentucky State Univ., Frankfort.
- Q363.** Use of 16S rRNA Targeted Oligonucleotide Probes To Study Competition between Ruminant Fibrolytic Bacteria. (252) A. A. ODENYO,\* R. I. MACKIE, and B. A. WHITE. Univ. of Illinois, Urbana.
- Q364.** Effects of Selective Agents on Rumen Bacteria and In Vitro Ovine Ruminant Pyrrolizidine Alkaloid Degradation. (254) D. E. WACHENHEIM,\* S. K. SMITH, and A. M. CRAIG. Col. of Vet. Med., Oregon State Univ., Corvallis.
- Q365.** Survey of Bacterial Flora Associated with Carrion Beetles (*Coleoptera: Silphidae*). (256) B. LUSTIGMAN\* and G. BERDELA. Montclair State Col., Upper Montclair, N.J.
- Q366.** Effects of Dietary Perturbation on the Hindgut Bacterial Community in Crickets (*Acheta domesticus*). (258) J. W. SANTO DOMINGO,\* M. G. KAUFMAN, and M. J. KLUG. Ctr. for Microbial. Ecology, Michigan State Univ., East Lansing.
- Q367.** Isolation and Identification of Bacteria from the Gut and External Ventral Surface of *Blatta orientalis*, *Blattella germanica*, *Periplaneta americana*, and Other Blattaria Collected in the Washington Metropolitan Area. (260) V. GRANT\* and T. SMITH. Howard Univ., Washington, D.C.
- Q368.** Enzyme Activities and Microbiota Associated with Mouse In Vivo and In Vitro Continuous Culture Systems. (262) G. NELSON,\* J. ALLISON, R. CHADWICK, and S. GEORGE. EHRT, Inc., and HERL-US EPA, Research Triangle Park, N.C.
- Q369.** Characterization of the Microbial Flora of Mosquito Breeding Sites in Mali. (264) J. F. HEIDELBERG,\* D. BRYANT, R. W. GWADZ, and R. R. COLWELL. Univ. of Maryland, College Park, and NIH, Bethesda, Md.
- Q370.** Interactions between Bacteria Isolated from Mosquito Breeding Sites and Larvae of *Anopheles gambiae* G3. (266) D. L. BRYANT,\* J. F. HEIDELBERG, O. SANKARE, R. W. GWADZ, and R. R. COLWELL. Univ. of Maryland, College Park, and NIH, Bethesda, Md.
- Q371.** Validation of a Substrate-Induced Response Method for Estimating the Biomass of Specific Microbial Guilds in Natural Systems. (268) S. K. SCHMIDT\* and P. M. RADEHAUS. Univ. of Colorado, Boulder.
- Q372.** Comparison of Community-Level and Isolate-Based Methods for Determining Microbial Community Structure. (270) J. L. GARLAND. Bionetics Corp., Kennedy Space Center, Fla.
- Q373.** Binding of an Extracellular Endoglucanase from Marine Shipworm Bacterium to Insoluble Cellulose. (272) S. IMAM,\* R. GREENE, and H. GRIFFIN. Biopolymer Res. Unit, USDA-Nat. Ctr. for Agricultural Utilization Res., Peoria, Ill.
- Q374.** Effects of Intact Rhizosphere Microbial Communities on the Mineralization of Surfactants in Surface Soils. (274) D. B. KNAEBEL. Dept. of Biol. Sci., Univ. of Cincinnati, Cincinnati, Ohio.
- Q375.** Vesicular-Arbuscular Mycorrhizae of Natural and Restored Sand Dunes. (276) D. A. KLEIN,\* S. MCGURK, W.

- N. TIFFNEY, JR., and D. W. EVELEIGH. Cook Col., Rutgers Univ., New Brunswick, N.J., and Univ. of Massachusetts, Boston.
- Q376.** Radioactive Gas Generation from Low-Level Waste Sites: Microbiological Analyses. (278) J. B. GILLOW,\* A. J. FRANCIS, and P. PICIULO. Brookhaven Nat. Lab., Upton, N.Y.
- Q377.** Comparison of Microbiological and Hydrogeological Methods in the Measurement of Vertical Groundwater Flow Rates. (280) M. HOLDER-FRANKLIN,\* M. SKLASH, A. CHAISSON, A. AINSLEY, S. GEORGES, O. IBRAHIM, and K. FAVRIN. Univ. of Windsor, Windsor, Ontario, Canada.
- Q378.** Use of COSTAR Microtiter Plates To Study Amoebic-Bacterial Interactions. (282) A. VASS\* and R. TYNDALL. Univ. of Tennessee, Knoxville, and Oak Ridge Nat. Lab., Oak Ridge, Tenn.
- Q379.** Relationships among Protozoa, Bacteria, and Chemical Constituents in a Sewage-Contaminated Aquifer (284) A. BUNN,\* N. KINNER, R. HARVEY, and A. WARREN. Univ. of New Hampshire, Durham; U.S. Geological Survey, Boulder, Colo.; and Natural History Museum, London, U.K.
- Q380.** Comparative Anaerobic Microbial Ecology of a Number of Hypersaline Ecosystems. (286) J. R. PATEREK. Salk Inst. of Biotechnology/Industrial Associates, Inc., San Diego, Calif
- Q381.** Variations in In Situ Biodegradation Activity within a Shallow Anoxic Aquifer. (288) N. R. ADRIAN,\* J. A. ROBINSON, and J. M. SUFLITA. Univ. of Oklahoma, Norman, and Upjohn Co., Kalamazoo, Mich.

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ABRAMSON S D	236	ALEXANDER S	46	ANDREAZZI D B	311	ATLAS R M	202	BALLOU D M	112	BARTON S S	284
ABSHIRE T	118	ALEXANDER S	62	ANDREAZZI D B	315	ATLAS R M	162	BALLOU D M	244	BARTON S S	284
ABU KWAIK Y	303	ALFA M	75	ANDREAZZI D B	196	ATLAS R M	62	BALLOU D M	302	BARTON S S	284
ACCIAI J	201	ALFARONE G	257	ANDREAZZI D B	290	ATLAS R M	274	BALLOU D M	41	BARTON S S	284
ACHBERGER E C	31	ALGER L	122	ANDREAZZI D B	206	ATLAS R M	62	BALLOU D M	277	BARTON S S	284
ACHESON D	112	ALI A	204	ANDREAZZI D B	40	ATLAS R M	302	BALLOU D M	245	BARTON S S	284
ACKERMAN M R	112	ALI A	41	ANDREAZZI D B	160	ATLAS R M	109	BALLOU D M	302	BARTON S S	284
ACKERMANN H W	194	ALI J Y	159	ANDREAZZI D B	242	ATLAS R M	66	BALLOU D M	244	BARTON S S	284
ACKERMANN M R	112	ALLAMAN J A	313	ANDREAZZI D B	155	ATLAS R M	42	BALLOU D M	302	BARTON S S	284
ACTIS L A	36	ALLAN J	5	ANDREAZZI D B	68	ATLAS R M	106	BALLOU D M	244	BARTON S S	284
ACUNA J	111	ALLAN J	107	ANDREAZZI D B	64	ATLAS R M	312	BALLOU D M	302	BARTON S S	284
ADAM S	118	ALLAN J	177	ANDREAZZI D B	164	ATLAS R M	244	BALLOU D M	302	BARTON S S	284
ADAM T	144	ALLAN J	130	ANDREAZZI D B	77	ATLAS R M	69	BALLOU D M	244	BARTON S S	284
ADAMS A M	309	ALLAN J	130	ANDREAZZI D B	313	ATLAS R M	144	BALLOU D M	302	BARTON S S	284
ADAMS D A	112	ALLAN J	130	ANDREAZZI D B	33	ATLAS R M	208	BALLOU D M	302	BARTON S S	284
ADAMS E	301	ALLAN J	25	ANDREAZZI D B	238	ATLAS R M	246	BALLOU D M	302	BARTON S S	284
ADAMS J C	34	ALLAN J	28	ANDREAZZI D B	264	ATLAS R M	68	BALLOU D M	302	BARTON S S	284
ADAMS J P	88	ALLAN J	75	ANDREAZZI D B	303	ATLAS R M	30	BALLOU D M	302	BARTON S S	284
ADAMS L B	222	ALLAN J	234	ANDREAZZI D B	97	ATLAS R M	163	BALLOU D M	302	BARTON S S	284
ADAMS L G	69	ALLEN S P	311	ANDREAZZI D B	141	ATLAS R M	305	BALLOU D M	302	BARTON S S	284
ADAMS M J	290	ALLEN S W	205	ANDREAZZI D B	12	ATLAS R M	122	BALLOU D M	302	BARTON S S	284
ADAMS R B	281	ALLEN S W	27	ANDREAZZI D B	117	ATLAS R M	214	BALLOU D M	302	BARTON S S	284
ADDY M	39	ALLEN M	120	ANDREAZZI D B	154	ATLAS R M	271	BALLOU D M	302	BARTON S S	284
ADES E W	107	ALLEN M E	120	ANDREAZZI D B	237	ATLAS R M	280	BALLOU D M	302	BARTON S S	284
ADJORLOLO G	29	ALLEN M J	304	ANDREAZZI D B	63	ATLAS R M	271	BALLOU D M	302	BARTON S S	284
ADKINS J P	162	ALLEN R D	28	ANDREAZZI D B	282	ATLAS R M	151	BALLOU D M	302	BARTON S S	284
ADLER H	118	ALLEN S	75	ANDREAZZI D B	236	ATLAS R M	117	BALLOU D M	302	BARTON S S	284
ADLER J	95	ALLEN S	205	ANDREAZZI D B	299	ATLAS R M	203	BALLOU D M	302	BARTON S S	284
ADLER-MOORE J	132	ALLEN S	27	ANDREAZZI D B	69	ATLAS R M	74	BALLOU D M	302	BARTON S S	284
ADLER-MOORE J P	132	ALLEN S	117	ANDREAZZI D B	17	ATLAS R M	306	BALLOU D M	302	BARTON S S	284
ADNEY W S	106	ALLEN S	120	ANDREAZZI D B	78	ATLAS R M	304	BALLOU D M	302	BARTON S S	284
ADRIANS P	26	ALLEN S	36	ANDREAZZI D B	36	ATLAS R M	214	BALLOU D M	302	BARTON S S	284
ADRIAN R	195	ALLEN S	283	ANDREAZZI D B	254	ATLAS R M	203	BALLOU D M	302	BARTON S S	284
ADRIAN R	316	ALLEN S	275	ANDREAZZI D B	197	ATLAS R M	74	BALLOU D M	302	BARTON S S	284
AELION C M	148	ALLEN S	282	ANDREAZZI D B	309	ATLAS R M	306	BALLOU D M	302	BARTON S S	284
AFFRONTI L F	151	ALLEN S	282	ANDREAZZI D B	280	ATLAS R M	214	BALLOU D M	302	BARTON S S	284
AGAH R	246	ALLEN S	302	ANDREAZZI D B	2	ATLAS R M	152	BALLOU D M	302	BARTON S S	284
AGARWAL S	113	ALLEN S	285	ANDREAZZI D B	26	ATLAS R M	131	BALLOU D M	302	BARTON S S	284
AGARWAL S	248	ALLEN S	133	ANDREAZZI D B	237	ATLAS R M	30	BALLOU D M	302	BARTON S S	284
AGBEDE O	276	ALLEN S	160	ANDREAZZI D B	305	ATLAS R M	272	BALLOU D M	302	BARTON S S	284
AGIATO L	111	ALLEN S	154	ANDREAZZI D B	104	ATLAS R M	79	BALLOU D M	302	BARTON S S	284
AGIN T S	160	ALLEN S	235	ANDREAZZI D B	156	ATLAS R M	280	BALLOU D M	302	BARTON S S	284
AGRAWAL K C	29	ALLEN S	171	ANDREAZZI D B	75	ATLAS R M	42	BALLOU D M	302	BARTON S S	284
AGUILAR M	158	ALLEN S	206	ANDREAZZI D B	247	ATLAS R M	236	BALLOU D M	302	BARTON S S	284
AGUILAR R	71	ALLEN S	296	ANDREAZZI D B	244	ATLAS R M	17	BALLOU D M	302	BARTON S S	284
AHEARN D G	313	ALLEN S	275	ANDREAZZI D B	275	ATLAS R M	113	BALLOU D M	302	BARTON S S	284
AHEARN D G	315	ALLEN S	282	ANDREAZZI D B	102	ATLAS R M	79	BALLOU D M	302	BARTON S S	284
AHEARN D G	316	ALLEN S	282	ANDREAZZI D B	206	ATLAS R M	249	BALLOU D M	302	BARTON S S	284
AHEARN D G	316	ALLEN S	302	ANDREAZZI D B	41	ATLAS R M	70	BALLOU D M	302	BARTON S S	284
AHEARN D G	316	ALLEN S	285	ANDREAZZI D B	121	ATLAS R M	265	BALLOU D M	302	BARTON S S	284
AHEARN D G	316	ALLEN S	133	ANDREAZZI D B	111	ATLAS R M	305	BALLOU D M	302	BARTON S S	284
AHEARN D G	316	ALLEN S	160	ANDREAZZI D B	144	ATLAS R M	12	BALLOU D M	302	BARTON S S	284
AHEARN D G	316	ALLEN S	154	ANDREAZZI D B	164	ATLAS R M	102	BALLOU D M	302	BARTON S S	284
AHEARN D G	316	ALLEN S	235	ANDREAZZI D B	40	ATLAS R M	65	BALLOU D M	302	BARTON S S	284
AHEARN D G	316	ALLEN S	171	ANDREAZZI D B	141	ATLAS R M	146	BALLOU D M	302	BARTON S S	284
AHEARN D G	316	ALLEN S	206	ANDREAZZI D B	287	ATLAS R M	58	BALLOU D M	302	BARTON S S	284
AHEARN D G	316	ALLEN S	247	ANDREAZZI D B	100	ATLAS R M	139	BALLOU D M	302	BARTON S S	284
AHEARN D G	316	ALLEN S	296	ANDREAZZI D B	238	ATLAS R M	150	BALLOU D M	302	BARTON S S	284
AHEARN D G	316	ALLEN S	244	ANDREAZZI D B	248	ATLAS R M	300	BALLOU D M	302	BARTON S S	284
AHEARN D G	316	ALLEN S	275	ANDREAZZI D B	195	ATLAS R M	287	BALLOU D M	302	BARTON S S	284
AHEARN D G	316	ALLEN S	102	ANDREAZZI D B	115	ATLAS R M	121	BALLOU D M	302	BARTON S S	284
AHEARN D G	316	ALLEN S	206	ANDREAZZI D B	145	ATLAS R M	217	BALLOU D M	302	BARTON S S	284
AHEARN D G	316	ALLEN S	244	ANDREAZZI D B	278	ATLAS R M	153	BALLOU D M	302	BARTON S S	284
AHEARN D G	316	ALLEN S	275	ANDREAZZI D B	41	ATLAS R M	123	BALLOU D M	302	BARTON S S	284
AHEARN D G	316	ALLEN S	282	ANDREAZZI D B	79	ATLAS R M	255	BALLOU D M	302	BARTON S S	284
AHEARN D G	316	ALLEN S	282	ANDREAZZI D B	117	ATLAS R M	111	BALLOU D M	302	BARTON S S	284
AHEARN D G	316	ALLEN S	302	ANDREAZZI D B	286	ATLAS R M	286	BALLOU D M	302	BARTON S S	284
AHEARN D G	316	ALLEN S	285	ANDREAZZI D B	204	ATLAS R M	81	BALLOU D M	302	BARTON S S	284
AHEARN D G	316	ALLEN S	133	ANDREAZZI D B	237	ATLAS R M	79	BALLOU D M	302	BARTON S S	284
AHEARN D G	316	ALLEN S	160	ANDREAZZI D B	152	ATLAS R M	244	BALLOU D M	302	BARTON S S	284
AHEARN D G	316	ALLEN S	154	ANDREAZZI D B	70	ATLAS R M	243	BALLOU D M	302	BARTON S S	284
AHEARN D G	316	ALLEN S	235	ANDREAZZI D B	113	ATLAS R M	306	BALLOU D M	302	BARTON S S	284
AHEARN D G	316	ALLEN S	171	ANDREAZZI D B	287	ATLAS R M	79	BALLOU D M	302	BARTON S S	284
AHEARN D G	316	ALLEN S	206	ANDREAZZI D B	41	ATLAS R M	123	BALLOU D M	302	BARTON S S	284
AHEARN D G	316	ALLEN S	244	ANDREAZZI D B	79	ATLAS R M	255	BALLOU D M	302	BARTON S S	284
AHEARN D G	316	ALLEN S	275	ANDREAZZI D B	117	ATLAS R M	111	BALLOU D M	302	BARTON S S	284
AHEARN D G	316	ALLEN S	282	ANDREAZZI D B	286	ATLAS R M	286	BALLOU D M	302	BARTON S S	284
AHEARN D G	316	ALLEN S	282	ANDREAZZI D B	204	ATLAS R M	81	BALLOU D M	302	BARTON S S	284
AHEARN D G	316	ALLEN S	133	ANDREAZZI D B	237	ATLAS R M	79	BALLOU D M	302	BARTON S S	284
AHEARN D G	316	ALLEN S	160	ANDREAZZI D B	152	ATLAS R M	244	BALLOU D M	302	BARTON S S	284
AHEARN D G	316	ALLEN S	154	ANDREAZZI D B	70	ATLAS R M	243	BALLOU D M	302	BARTON S S	284
AHEARN D G	316	ALLEN S	235	ANDREAZZI D B	113	ATLAS R M	306	BALLOU D M	302	BARTON S S	284
AHEARN D G	316	ALLEN S	171	ANDREAZZI D B	287	ATLAS R M	79	BALLOU D M	302	BARTON S S	284
AHEARN D G	316	ALLEN S	206	ANDREAZZI D B	41	ATLAS R M	123	BALLOU D M	302	BARTON S S	284
AHEARN D G	316	ALLEN S	244	ANDREAZZI D B	79	ATLAS R M	255	BALLOU D M	302	BARTON S	

BECKMANN S	60	BERLIN O G W	145	BLAKE D C JR	207	BORTOLOTTO I M	275	77	208	275
BECKWITH J	8	BERMAN M H	278	BLAKE M	249	BOS P	174	304	BRYAN R	206
	197	BERMUDES D	195	BLAKE M S	113	BOS S K	122	186		301
BEDARD D	26	BERMUDES L E	251	BLAKE R C H	174	BOSLEY G	173	107	BRYAN R T	45
BEDARD D L	26		221	BLAKE R H	138	BOSSE M	70	208	BRENNER D J	17
BEDNARZ-PRAHAD A	29	BERNAL R	158	BLAKEMORE R	101	BOSTICK C C	281	163	BRENNER V	316
	J		306	BLAKESLEY R W	241	BOISFORD J L	276	41	BRESNAHAN P A	66
BEEBE J L	206	BERNARD D	65	BLANCHARD A	20	BOITM	118	173	BRETZ A G	316
BEEBEE T	146	BERNARD K	8	BLANCHARD D K	98	BOTT M	201	40	BREYER R	69
BEECHER D J	146	BERNARD R L	294	BLANCHARD S	165	BOTT T L	206	110	BREYNAERT J	245
BEEUMEN J V	111	BERNS K	224	BLANCHFIELD B	202	BOTT T L	34	272	BREZNAK J A	785
BEGGS W H	76	BERNSTEIN D	110	BLANCO J	113	BOTT T L	59	103	BRICE J L	272
BEGLEY G	105	BERNSTEIN R M	81	BLANCO M	113	BOTTA G	287	244	BRICKLER J	307
BEGLEY T P	251	BERRY A	113	BLAND L	201	BOTTONE E J	152	35	BRICKMAN T	196
BEHFOROUZ N C	17	BERRY C J	78	BLANDING J	301	BOUCHARD M	42	122	BRICKMAN T J	300
	121		100	BLANK K J	92	BOUCHER I	272	281	BRIGGS C	309
BEHKI R	188	BERRY D	278	BLASCHKE H P	28	BOURBEAU P	206	33	BRIGMON R L	136
BEHLAU I	113	BERRY D F	195	BLASER J	71	BOURGAIZE D	157	272	BUCHER B	196
BEIERLE J W	155	BERRY M L	286	BLASER M J	32	BOURGAULT A	285	108	BUCHER D	185
BEIFFUS M J	100	BERTASSO A	32	BLATNER W	42	BOURGAULT A M	285	243	BUCHHOLZ L A	34
BEJ A K	69		217	BLAZEK J E	112	BOURGEAIS A L	280	245	BUCHMAN G W	241
	228	BERTOCCHI P	68	BLAZEK J E	296	BOURQUE S N	162	246	BUCHMEIER N	113
BELANGER M	305	BERTOLIN J L	236	BLECKER D L	243	BOUSHIRA M	92	264		143
BELAS M R	95	BESCH-WILLIFORD C L	37	BLEICKER C A	303	BOUTILIER J	150	138	BUCK C	311
	187	BESETH B D	246	BLEIWEIS A S	122	BOVE J M	68	206	BUCK G	198
BELAS R	223	BESSETTE D R	152	BLEIWEIS S A	177	BOVEY S	269	66	BUCK M L	301
BELASKI C	150	BEST E A	204	BLÉNKINSOPP S A	238	BOVRE K	206	194	BUCK P	201
	276	BETLACH B	158	BLOBEL H	32	BOVRE J	304	315	BUCK T	300
BELCHER K E	284	BETLEY M J	35	BLOCH E	145	BOVDRE J	159	309		309
BELENKY A	62		205	BLOCH C	70	BOVDRE J H	206	114	BUCKLEY H R	54
	110	BETTER M	183	BLOMFIELD I C	273	BOWEN S H	159	30		92
BELUSLE J T	98	BETTERTON E	248		314	BOWEN T M	304	206	BUCKLEY T	291
	278	BEUCHAT L R	249	BLOMME W	110	BOWER J K	107	279	BUCKNER J	276
BELKIN S	161	BEVERIDGE T	258	BLOOM F E	18	BOWMAN B	305	68	BUDWILL K	272
BELL D	169	BEVERIDGE T J	24	BLOY H	159	BOWMAN B	131	160	BUENLER J	42
BELL J	185		31	BLUM H E	158	BOWMAN E	25	29	BURK A	309
BELL M D	257		250	BLUM L K	203	BOWMAN W	118	111	BUGGY J J	156
BELLANTI J A	28	BEVERLEY S M	25	BLUNDEEN P	254	BOWYER T	315	231	BUISSON G	196
	160	BEYER J	306	BLY J E	121	BOYCE J M	10	207	BUKANOV N O	37
	315	BEYRIE M	124	BLY L	308	BOYD A	165	207	BUKOVICH J	286
BELLEN H J	41	BHADURI S	29	BLYTE L	68	BOYD B	299	303	BURKINSKY M	296
BELLENGER E	37	BHAGAT H	69	BOAL J	199	BOYD G	112	109	BUKAWKA D	309
BELLI W A	105	BHARGAVA A	185	BOATENG E	29	BOYD J	115	301	BULLAS L R	28
BELLIDO F	197	BHARGAVA A	208	BOBADILLA M	280	BOYD J	12	201	BULLER R	150
	295	BHATNAGAR D	22		305	BOYD S A	26	224		158
BELSCHES A	306		37	BOBO L D	201	BOYLE A L	100	300	BULLERMAN L	115
BELSHE R	29	BHATNAGAR L	106	BOBODER C R	74	BOYLE A W	26	310	BULLOCK H	77
BELSHE R B	29	BHATT T R	248	BODEY G P	236	BOYLE J	26	162	BUNN A	316
BEMIS D A	208	BHATTACHARYYA D	200	BODMER T	237	BOYLE J F	61	250	BURBACK B I	116
BEN-HAFSIA A	208	BHATTI A R	33	BODY B A	200	BOYLE M D P	243	261	BURCH L H	38
BENBADIS L	308	BHUGRA B	159	BOEDEKER E	159	BOYDE M D	62	105	BURCHHARDT G	232
BENBOW N	39	BHUNIA A K	146	BOEDEKER E C	185	BOYLE S M	246	200		283
BENDER J	154		308	BOEHM D F	221	BOYLE T	69	315	BURETTE A	309
BENDER R	108	BHUPATHIRAJU V K	33	BOEHM M	304	BOYLE VAVRA S	281	200	BURGER R	51
BENDER R A	108		308	BOEHMKE M	42	BOYLES C C	273	154	BURGESS D	236
BENDINELLI M	178	BIALKOWSKA-HOBRZANSKA H	162	BOELIN P	150	BOYLES C C	177	275	BURGESS L	300
	253	BIANCHINI H	198	BOERMAN P A	173	BOZZA M	217	148	BURGESS N A	302
BENDIUK N	58		248	BOETTMER K J	248	BOZZINI P	250	77	BURGESS-CASSLER A	274
BENEDIKTSSON H	286		196	BOGDAN J A	196	BRACCO A A	26	34	BURGHOFF R	34
BENHAMOU G	235	BIANCO C	284	BOGDAN J A	303	BRADFORD H	11	278	BURJAW B	39
BENINGSIG L	201	BIANCO P R	242	BOGUSLAWSKI G	122		315	118	BURKART T	241
BENJAMIN R	301	BIBB W	146	BOHACH G A	281	BRADFORD P A	295	301	BURKE C	277
BENJAMIN R C	117		310	BOHUON C	111	BRADLEY B	30	102	BURKE D	29
BENJAMIN W H JR	113	BIBERSTINE K J	287	BOK J D	106	BRADLEY D V	310	214		81
BENJAMIN W JR	113	BIDINOST C	36	BOKETE T	280	BRADLEY D W	29	255		132
BENN J	241	BIEHLE J R	76	BOKKENHEUSER V	75		57	161	BURKE R L	40
BENNANI H	287	BIEL A J	293	BOLANOS B	131	BRADY L J	177	74	BURKE T J	38
BENNEKOY T	37	BIELETZKI J T	310	BOLANOS G	228		247	121	BURKHARDT W III	278
BENNETT D	30	BIESTERVELD S	274	BOLE P L	76	BRAGG S L	277	276	BURKHART T M	34
BENNETT G N	166	BILLÉ J	30	BOLDIN M	61	BRACHEM A	29	283	BURLAGE R	153
	91		202	BOLEN C A	241	BRAIDT J	30	99		282
BENNETT J	132	BILLIE M	76	BOLLET C	284		66	162	BURLEIN J	102
	78	BILLS G	104	BOLLINGER E	315	BRAITHWAITE C E	208	77	BURMAN D	29
BENNETT J W	82	BILTON D	303	BOLMSTROM A	278	BRAJTBURG J	76	129	BURNE R A	108
	154	BINGEN E	287	BOLTON E	192	BRAKE S	150	246	BURNENS A P	110
BENNETT L	35	BINNING M	276	BOMBARDIER K J	116	BRAKER G	139	313	BURNETT D	303
BENNETT P M	31	BINSZTEIN N	314	BOMFIM G	70	BRAMHILL D	72	40	BURNETT M E	251
BENNETT R	202	BIONDO F	189		102	BRANDEN C J	314	144	BURNETTE B	296
BENNISS M	4	BIONDO F X	189	BOND S	151	BRANDHORST T	118	109	BURNETTE W N	41
BENNISSON B	201	BIRCHER J	236	BOND W	62	BRANDIELE M C C	275	117		281
BENSING B A	36	BIRCHER J	315		176	BRANDON L	166	29	BURNHAM G	25
BENSON C	159	BIRD E	235	BOND-GREEN J	256	BRANDT B	299	112	BURNHAM J C	31
BENSON D R	239	BIRKENMEYER L	206		62	BRANDT C	242	265	BURNHAM M	182
	251	BIRKHOLZ S	121		110	BRANDT F H	152	74	BURNS D L	41
BENTLEY D W	284	BIRKNES K A	310	BONDI J M	301	BRANDT J A	30	93		197
BENTON K A	245	BISAILLON J G	195	BONILLA P	107	BRANDT K	120	WB	BURNS E H JR	208
BERCHE P	160	BISCHOFF J	236		152	BRANNAN D	9	66	BURNS G	305
BERDELA G	316		272		155		WB	110	BURNS J L	181
BERES S B	293	BISHOP P	108	BONNER D P	243	BRANNAN D K	91	310	BURNS KEIHER L L	283
BERETTI J L	160	BISHOP P E	154	BONNET M	77		315	188	BURR D H	280
BEREZNEY M J	278	BISHOP P L	246	BOODRAM C	39		WB	150	BURRIS J	112
BERG C M	241	BISTONI F	286	BOOM H	266	BRANTNER C A	34	92	BURROUGHS M	286
	273	BISTRUP A	144	BOOMINATHAN K	251	BRAR D W	245	219	BURROWS L L	112
BERG D	31	BITTKER S	62	BOONE D R	116	BRASSETT M A	31	277		164
	89	BITTNER W	303	BOONE J H	285	BRATOEYA M P	275	195	BURTON A	68
BERG D E	241	BITTON G	33	BOOPATHY R	154	BRATTEGAARD K	29	30	BURWEN D	61
	37	BITZAN M	281	BOOTH P	WB	BRAUER R	300	244	BUSBY S	172
	108	BJORCK L	247	BOOTHBY J T	144	BRAYMAN A	188	17	BUSH C A	257
	280	BLACK B L	310	BOPP C A	198	BRAYNS L	139	122	BUSH K	237
BERG R	287	BLACK C M	201	BOPP L H	41	BRAWNER D L	74	188		284
BERGER M	127	BLACK J	9	BORCHARDT K A	284		244	77	BUSHMAN F	87
BERGER S	39	BLACK J N P	195	BORDALLO C	121	BRAWNER T	176	47	BUSTAMANTE V	280
BERGERON D	155	BLACK L	193	BORDON F	217	BRAYER G D	258	241	BUTCHER A	201
BERGOGNE-BEREZIN E	232	BLACK P N	214	BORDUN A	281	BRAYMER H D	72	112		242
BERGSTROM J	104	BLACK S H	222	BOREHAM P F L	152	BRECHER M E	201	280	BUTLER C	206
BERGSTROM R	299	BLACKMORE P H	32	BORELL C	39	BRECKENRIDGE C R	188	201		246
BERISH S A	97	BLACKWELL M	47	BORNEMANN H	77	BREEDEN L	276	280	BUTLER R C	276
BERK R S	58	BLAIS J	31	BOROVIAN G	WB	BREEN A	33	105		301
	114		76	BORRERO I	158	BREIDT F	308	26	BUTLER T	110
BERK S G	25	BLAKE A	308	BORSHEIM K	WB	BREMER P J	23	37	BUTLER W	145
BERKHOF H A	245	BLAKE C	26	BORST D W	35	BRENNAN M J	26	164	BUTLER W R	78
BERLIN B	309	BLAKE C K	26	BORTNER C A	69		201	217		200





CRAFT R	145	DALUI C	18	DEAN D	122	DIAS F	200	DOUGHERTY B A	278	304	
CRAIG A M	279	DALL L	245	DEAN G	208	DIAZ A M	242	DOUGHERTY J M	257	OYER J	160
CRAIG N L	316	DALLAS H L	202	DEAN R G	79	DIAZ M	154	DOUGHERTY J	100	DYKE J W	66
CRAIG S	87	DALTON H	275	DEAN-NYSTROM E A	304	DIAZ M R	251	DOUGHERTY S	279	DYKSTUIZEN D E	88
CRAIN M J	274	DALTON H P	276	DEAZAVEDO J	280	DIAZ R	238	DOUGHMANN J	301	DYKSTERHOUSE S E	26
CRAWIOTO A	198	DALTON M T	275	DEBEY M C	99	DIBISCEGLIE A	158	DOUGLAS C	76		248
CRAWFORD D L	221	DALY J A	39	DEBIASE J	68	DIBISCEGLIE A M	86		104	DYKSTRA M A	44
	106		301	DEBORDE D C	29	DICESARE J L	191	DOUROS T	300	DYTCC M	280
CRAWFORD J	61	DALY J S	276	DEBOY J	190	DICHRISTINA T	242	DOUTHWRIGHT J A	294	DZIEJMAN M	312
	256	DAM L	237	DECKARD L A	188	DICK J	251	DOWLING N J E	238	DZIKI A	286
CRAWFORD J T	16	DAMIANI G	61	DECKER W W	188	DICK J D	235	DOWNER D	176	DZIUBA M	194
	49	DANEQ-MOORE L	164	DECOCK K	29	DICK W A	310	DOWNES F P	309		
	118	DANESHVAR M	173	DECOURCEY M	276	DICKSON J	188	DOWNEY J	150		
CRAWFORD R	200	DANGANAN C	312	DEDIER H	158	DICKENSON T M	207	DOWNEY P	31		
CRAWFORD R L	154	DANIEL P	66	DEEN J L	310	DICKER R	94	DOWNING S	62		
	255	DANIEL S L	274	DEEPE G S	92	DICKINSON J R	106	DOWNS D M	251		
CRAY W C JR	40	DANIEL T M	49	DEETER F G	146	DICKSON R C	108	DOWZICKY M	244	FAMSLA C	123
CRERAN L	243	DANIELS E K	122	DEGIROLAMI P C	276	DICOSIMO R	64	DOYLE J D	34	EARDLY B	239
CRESCENZI F	257	DANIELS L	7	DEGNAN A J	248	DIEDRICH D L	197	DOYLE M L	232	EARMART C F	197
CREWE-BROWN H H	213	DANIELS S	204	DEGNAN B A	15		208	DOYLE M P	115	EARL J	206
CRIDDLE C	148	DANIELSON R E	51	DEGROOT S S	50	DIELS L	79	DOYLE R	258	EARLEY D L	121
CRIST A E JR	30	DANKERT J	25	DEGRUGILLIER M	240	DIEM L	66	DOYLE T J	113	EASTER R	308
	244		303	DEHOFF B S	204		145	DRAGON B	301	EASTMAN S L	71
CRIST A JR	153	DANKERT J R	121	DEICH R A	160	DIENA B	30	DRAGON E	247	EASTON A M	205
CROAN S C	283	DAO M L	177	DEINHARD G	173		236	DRAKE H L	274	EATON R W	117
CROCHET J	66	DARBORD J C	287	DEIS K	301		300	DRAPER D	152	EBERHARDT K	273
CRONAN J E	214	DARE A	200	DEL PRETE R	287	DIETRICH D K	26	DRAPER P	102	EBERHARDT K J	273
CRONAN J E JR	214	DARFEUILLE MICHAUD	305	DEL RIO A	228	DIEZ M	104	DRAWBAUGH C	206	EBRIGHT R	89
	293			DEL SANTE M	284	DIGLIO M L	272	DREBOT M	207	EBRIGHT R M	172
CRONAN S	70	DARZINS A	42	DELANAY J M	197	DIJKSHOORN L	91	DRECKTRAM D B	150	ECHEVERRIA P	110
CRONIN K	51		95	DELANEY M	118		109	DREESON D	17	ECKHAUS M	245
CROSA J H	36	DELEON R	191	DELEAZENE-BRIGGS K	188	DILLARD J	299	DRELICHMAN V	301	ECKMAN M K	311
	111	DELEZENE-BRIGGS K	188			DILLON R	202	DREW W L	265	EDBERG S C	25
	223	DASCH G	123	DELGADO G	306	DING H	312	DRISCOLL E	30		194
CROSA L M	36		173	DELGADO J	166	DING S	311	DROEGE M W	248	EDDY C	234
CROSS E	110	DASGUPTA M K	245	DELGADO R	242	DINUZZO A	276	DROMSFIELD M	11	EDDY C K	69
CROSSLAND S	37	DASGUPTA T	258	DELGADO S	242	DIONIGI C	162	DROWART A	102		118
CROTEAU D	71	DASHEK W V	79	DELGADO-DIAZ F	110	DIOUF B	102	DRUMMER M	151		204
CROTTI D	284	DASKAL I	276	DELISLE A	70	DIRKSEN C L	29	DRUMMOND P	300	EDDY G	29
CROUSE D	227	DASSARMA S	79	DELLA-LATTA P	236		158	DRYA D	236	EDELMAN D	12
CROW S A	316		156	DELONG E	267	DISCHINGER C	272		301	EDELMAN R	185
CROW S A JR	78	DATTA A R	198	DELONG E F	130	DISMER M	105	DU MOULIN G	39	EDELSTEIN P H	243
CROWE S	280	DAUBARAS D	76		203	DISPENSA M	117		75	EDERER M M	312
CROWELL R L	82	DAVIDSON B E	249	DELUCCA A J	272	DISSINGER S	283	DUARTE R	158	EDGAR P	158
	168	DAVIDSON D	39	DELVECCHIO V	201	DITTMER R	242	DUBE M	235	EDMISTON C E	285
CROWLEY P J	177	DAVIDSON R J	217	DEMAMAIN A L	104	DIX K	164	DUBEN-ENGELKIRK J L	91		313
CRUZ J E	154	DAVIDSON V L	165	DEMARQUEZ M	29	DIXON D	206	DUBIN D T	273	EDMOND M	76
CSONKA L N	105	DAVIES H C	165	DEMBRY L M	76	DIXON D M	13	DUBNAU D	213	EDMONDS P	280
	312	DAVIES M J	100	DEMERLEE E	109	DIXON T C	74	DUBOIS A	118	EDWARDS A	16
CUCHURAL G J JR	237	DAVIES N J	274	DEMERLEE S	275	DIXON T C	163	DUBOIS D	201	EDWARDS D	199
CULBERSON D O	152	DAVIS A	203	DEMERY P	152	DIZIKES J	39	DUBREUIL J D	281	EDWARDS D E	272
CULBERTSON C W	254	DAVIS C	122	DEMOLL E	118	DJAVACHISHVILI T	271	DUBRILE C	62	EDWARDS E A	195
CULLEN A	158	DAVIS C P	77	DAMPSEY M	296	DJEU J Y	219	DUCAT L	259	EDWARDS K M	309
CULVER K	133	DAVIS E O	102	DENBLEYKER K	243		178	DUDDLESTON K M	255	EDWARDS W R	280
CULVERHOUSE M	244	DAVIS J	234	DENG G	199		222	DUFAL T	301	EENHUIS C	72
CUNDIFF D D	37	DAVIS J C	74	DENNING D W	79	DOBEREINER J	90	DUFF P	206	EEROLA E	119
CUNHA B A	31	DAVIS J W JR	199	DENG Y	314	DOBBINS D	78		247	EGAL M	146
	299	DAVIS L	103	DENTON C L	171	DOBBINS D C	148	DUFFEY P S	200	EGAN R	300
CUNNIFFE J	313	DAVIS R E	198	DENTON M J	109	DOBOS K M	102	DUFFY L	236	EGAN W	199
CUNNINGHAM E B	119	DAVIS R W	131	DERESINSKI S	151	DOCKENDORFF T C	239	DUFRESNE C	104	EGEL D S	74
CUNNINGHAM J M	184	DAVIS T	39	DERESINSKI S C	121	DOCKERY R J	211	DUFRESNE S	33	EGESTORFF J	188
CUNNINGHAM J V	11		75	DERETIC V	70	DODDS K	202	DUGAN P R	71	EGGLESTONE S I	275
CUNNINGHAM K A	203	DAVIS W C	222	DERTZBAUGH M T	247	DODGE C J	254	DUGGER K O	171	EGLI C	258
CUNNINGHAM-RUNDLES S	179		281	DERU L	200	DODGE D E	310		277	EHRHARDT A F	279
		DAVIS W K	91	DERY C V	307	DODSON K W	314	DUGOURD D	303	EHRHARDT H L	254
CUPP B	171	DAVIS-HOOVER W	162	DESAL J	80	DOGGETT T	185	DUGUID I G	77	EHRICH K C	241
CURIALE M	21	DAWSON C	122	DESAL M S	68	DOGGETT T A	185	DUM B	303	EHRICH M	18
CUROTTO J	76	DAWSON G J	86	DESMOND E P	120	DOHI S	281	DUMA R	275	EHRMANN I E	41
	104	DAWSON J	309	DESHANDEZ D	208	DOI R H	274	DUMMONS K	154	EICHELBERGER K	276
CURRENT W	W20	DAWSON T E	308	DESHANDEZ R G	145	DOIG P	304	DUMONT F	104	EIDEMILLER J	271
CURRY W	201	DAY A	247	DESHANDEZ R G	145	DOLAN M J	208	DUNBAR D	200	EIDEMILLER J	271
CURTIN P	281	DAY D	308	DESHANDEZ R G	145		310	DUNKIN S M	123	EISENACH K	66
CURTIS J L	121	DAY D F	308	DESHANDEZ R G	145	DOMBROSKI A	149	DUNKLEY I	158	EISENACH K D	16
CURTIS S E	108	DAY S M	103	DESHANDEZ R G	145	DOMENICO P	31	DUNLAP N	113		49
CURTIS R III	113	DAYALU K I	147	DESHANDEZ R G	145		299	DUNLAP P V	118		200
	185	DAYDAY C	241	DESHANDEZ R G	145	DOMER J	277		196	EISENHAEUER P B	W13
	201	DE ANTONI G	28	DESHANDEZ R G	145	DOMERY A	139	DUNN B E	69	EISENHAEUER P B	287
CURTS J	107	DE AZAYVEDO J	201	DESHANDEZ R G	145	DOMINGUE G J	208	DUNN D L	304	EISENSTEIN B I	273
CUSHION M T	171	DE BARBEYRAC B	68	DESHANDEZ R G	145	DOMINGUEZ M	158	DUNN J C	265		314
CUTLER R R	66	DE BLOIS S	106	DESHANDEZ R G	145	DOMINGUEZ P	145	DUNN J J	206	EISENSTEIN T K	121
	151	DE BRIEL D	240	DESHANDEZ R G	145	DONABEDIAN S	109	DUNN J P	307		178
CYNAMON M	145	DE BRITO S	197	DESHANDEZ R G	145	DONALD C	71	DUNN R L	236	EISENBERG L G	218
CYNAMON M H	137	DE BRUYN J	102	DESHANDEZ R G	145	DONEGAN J	19	DUNNE W M JR	31	EISSENBERG L G	171
	278	DE GIROLAMI P C	276	DESHANDEZ R G	145	DONG J M	156	DUNNELL N	77	ETHEL A	247
CYR C	39		300	DESHANDEZ R G	145	DONNAL T	244		234	EKBERG B	300
	75	DE GRANDIS S A	201	DESHANDEZ R G	145	DONNELLY C	21	DUNNIGAN M E	25	EKEIL I	80
CZARNECKI S	116	DE GROOT S	216	DESHANDEZ R G	145	DONNELLY P K	78	DUNNY G	35	EL BENNA J	11
CZECZULIN J R	281	DE HERNANDEZ G	158	DESHANDEZ R G	145	DONNENBERG M	221		36	EL BAKRY A	240
CZUPRYNSKI C	121	DE JONGE B	295	DESHANDEZ R G	145	DONNENBERG M S	42	DUNNY G M	36	EL JANNE M	228
		DE JONGH B	51	DESHANDEZ R G	145		314	DUNST R	262	EL-ZAATARI F A	102
		DE LA MAZA L	119	DESHANDEZ R G	145	DONOHUE L S	50		262	EL-ZAATARI M	74
		DE LA MAZA L M	119	DESHANDEZ R G	145	DONOHUE T	35	DUOBINIS-GRAY L	275	ELBERG S	234
			197	DESHANDEZ R G	145	DONOHUE T J	56	DUPONT M P	171	ELDER E D	76
			282	DESHANDEZ R G	145	DONOHUE T J	156	DUPUIS C	202	ELDRIDGE J	107
			197	DESHANDEZ R G	145	DONOHUE T J	156	DURACK D T	131	ELDRIDGE J H	113
			197	DESHANDEZ R G	145	DONOHUE T J	156	DURAN A	25	ELDRIDGE J H	264
			197	DESHANDEZ R G	145	DONOHUE-TOLFE A	112	DURAN M	242	ELEUTERIO M	240
			197	DESHANDEZ R G	145	DOOLEY C P	309	DURHAM P	214	ELKAN G H	239
			197	DESHANDEZ R G	145	DOOLEY S	61	DURHAM R	230	ELKIND C C	181
			197	DESHANDEZ R G	145	DOOLEY S W	137	DURREY E	74	ELKINS K L	58
			197	DESHANDEZ R G	145	DOOLITTLE M M	255	DURRY E	61	ELLENOR R D	228
			197	DESHANDEZ R G	145	DOORNEWEED R E	248	DUTTA S K	194	ELLENOR R D	228
			197	DESHANDEZ R G	145	DOPATKA H	300	DUTTON G G S	287	ELUNGSEN E	285
			197	DESHANDEZ R G	145	DOPATKA H D	309	DUTTON M	81	ELLIOT E L	115
			197	DESHANDEZ R G	145	DOPATKA F	110	DWORKIN R	276	ELLIOTT J	311
			197	DESHANDEZ R G	145		284		300	ELIUS B	257
			197	DESHANDEZ R G	145	DOROW K E	148	DWYER B	123	ELIUS B D	238
			197	DESHANDEZ R G	145	DORSEY M J	207	DWYER B W	145		313
			197	DESHANDEZ R G	145	DORTCH I J	116	DYBVG K	20	ELIUS D	120
			197	DESHANDEZ R G	145	DORWARD D	212		199	ELIUS J E	152
			197	DESHANDEZ R G	145	DOUCET M	30		97	ELIUS-BREEZE D	39
			197	DESHANDEZ R G	145	DOUCET-POPULAIRE F	16	DYER D W	111	ELLNER J J	222





HEBEL R	122	HICKEY E	70	HOLLAND P M	62	HSEIN T	161					300
HECTOR J S R	16	HICKEY R F	78	HOLLIS D G	8	HSHAO C L	18			JANEWAY C A JR	133	
HEDRUM A	62	HICKEY W J	117		208	HSHEN K M	272			JANG Y	200	
HEERZE L	198		195	HOLLIS R	275	HSHEN M	217	IANDOLO J J	36	JANSEN D L	201	
HEFFNER M J	275	HICKMAN M E	111	HOLLIS R J	109	HSHU C H	251	I'BEANUSI V	254	JANSEN H M	303	
HEFFORD M A	79	HICKS K E	206	HOLLOWAY H	176	HSHU D	72	I'BRAHIM O	316	JANSON M	305	
	153	HIDAKA T	278	HOLLOWAY L	164	HSHU J	165	I'BYEN P	286	JANSONS V K	278	
HEFTA S A	102	HIERHOLZER W	109	HOLLOWAY W J	31	HSHU JONES L	106	I'GLESIAS M F	160	JANSEN D B	117	
HEGARTY V	304	HIERHOLZER W J JR	61		76	HSHU M	244	I'GLEWSKI B H	114	JAP B K	248	
HEGGEN L M	257	HIGDEM D M	116	HOLM M	158	HSHU J K	42		127	JAP R A	258	
HEGGERS J P	158	HIGGINS K	29	HOLM M A	265	HSHU L T	42	IHLER G M	42	JACUA R A	110	
	236	HIGGINS N P	312	HOLMES B	31	HU L	20	IJIMA O	35		276	
	287	HIGH J M	177	HOLMES D	101	HU P C	106	IIMURA Y	165	JACUA STEWART M J	110	
HEIDELBERG J F	316	HIGHLEY C T	34	HOLMES K V	184	HU W S	283	IIZAWA Y	121		275	
HEIDGER P M JR	208	HIGHLEY T L	153	HOLMES R K	41	HUA M S	147	IJERMAN M M	25		276	
HEIFETS L	278	HIGHSMITH A K	107		281	HUA M S	199		154	JARBLUE D L	104	
HEINE P	152	HIGHSMITH W E JR	38	HOLMES P L	306	HUANG B	173	IKEDA T	287	JARECKI BLACK J	29	
HEINRICH D E	111	HIGHTOWER S K	248	HOLMES V J	304	HUANG C	153		304	JARLIER V	244	
HEINRICHS J H	202	HIGSON F K	163	HOLMGRIN J	304	HUANG H	273	ILES P B	273	JARROLL E L	278	
HEINZE T	78	HILL B	150	HOLMSTAD G	208	HUANG H	281	IILLUMINATI L	281	JARRVILL TAYLOR K	81	
HEINZINGER N K	251	HILL C W	204	HOLT P	287	HUANG J	33	IILSTRUP D M	33	JARVIS W	199	
HEISE R	105	HILL D P	287	HOLT S C	51	HUANG J	272	IILVER D	97	JARVIS W	304	
HEITER B	206	HILL J M	296	HOLTOM P	309	HUANG L	308	IIMADA T	276	JARVIS W	61	
HEITKAMP M A	272	HILL R L	290	HOLTOM R H	265	HUANG M	104	IIMAI S	57	JARVIS W R	134	
HEITZER A	63	HILL R T	72	HOLTZMAN A	145	HUANG M B	62	IIMAM S	316	JASCHKE G	93	
	282		203	HOLZER G	278	HUANG S	243	IIMBODEN P	241	JASKOT D	301	
HEJBLUM G	244	HILL S L	228	HONMA S	121	HUANG S W	165	IIMPERATRICE C A	1-0	JASKOT D	198	
HEJMA J	30	HILL W E	303	HONE D	119	HUANG Y	165		243	JASS J	313	
HELBER J T	42	HILLAM R P	230	HONE D M	12	HUBBARD J	199	IMPRAIM C	1	JAUSSAUD R	111	
HELD N J	39		150	HONEYMAN A L	113	HUBER M S	116	INAMINE J M	278		286	
HELMANN J D	35	HILLANBRAND D A	265	HONG J	69	HUCKZO E	25	INNOERLIED C B	159	JAVIER J L	72	
HELMINEN M	286	HILLIER A J	237	HONG J	28	HUCKZO E	243	INGHAM S	249	JAVOR G	251	
HELMSTETTER C	72	HILLIER S L	249	HONG X B	204	HUDSON J	122	INGRAM J	251	JAWORSKI A	312	
HELMSTETTER C E	72	HILVERT D	206	HONG X	111	HUDSON L L	290	INGRAM D	162	JAWORSKI D	5	
HEMSEL L	310	HIMMEL M E	183	HOOK B S	158	HUDSON M C	177	INGRAM L O	27	JAY J M	65	
HELSER J	301	HIMPEL L	106	HOOK E III	301	HUDSON Y M	246		204	JAY P	194	
HEMB R	39	HINDLER J	287	HOOK L A	239	HUDSPETH D S S	287	INOUE O	12	JAYARATNE P	299	
HEMMINGSEN B B	194	HINDLER J A	W11	HOOK M A	246	HUDSPETH M E S	37	INOUE T	37	JAYASWAL R K	247	
	239	HINNEBUSCH C	236	HOOK R	58		293	INOUE Y M	166	JAZWINSKI S M	306	
HENDERBERG A	237	HINTON S	34	HOOKER A M	28	HUESCA M	280		172	JECHOREK R P	181	
HENDERSON D P	16	HINTON S M	138		226	HUGHES B	60		283	JEHL F	240	
	111	HIPP W M	165	HOOPER A B	163	HUGHES E	114	INZANA T	62	JELINKOVA J	257	
HENDRICKS A C	255	HIRA P R	110	HOOPER D	217	HUGHES E J	117		257	JEMAL C	206	
HENDRICKS C W	34	HIRSCH C	104	HOOPER D G	301	HUGHES J E	79	IPPEN-IHLER K	36	JENKINS R	104	
HENDRICKS D A	158	HIRSCH L	301	HOOPER S W	13	HUGES K	12	IRBINSKAS I I	205	JENKINS S	170	
HENDRICKS K	284	HIRSCH P	139	HOOPER D	248		35	IRINO K	275		244	
HENDRICKSON D A	272	HIRSCH S	199	HOOPER R	305		111	IRVIN R T	40	JENKINS S G	85	
HENDRICKSON W	312	HIRSCHBERG R	42	HOOPER R	305	HUGHES L E	273	IRVINE B	265		170	
HENDRIX L	123	HIRSCHMANN M	276	HOPEWELL P C	49	HUGHES T K	251	IRVINE K N	107		236	
HENDRIX R	193	HIRSH D	285		151	HUIE G	29	ISAACSON R	12	JENNINGS D	313	
HENDRIX R W	193	HIRSHFIELD I N	37	HOPFER R L	38	HULBERT B	116	ISADA C	265	JENSEN E T	121	
HENEINE W	242	HIRST P H	111		151	HULBERT T	66	ISBERG R	181		286	
	296	HISSONG B D	121	HOPKINS A	302	HULL R	171	ISBISTER J	116	JENSEN H G	245	
HENGGE-ARONIS R	260	HITCHINS A D	202	HOPKINS G	148	HULL S	314	ISEMAN M D	278	JENSEN J	92	
HENKEL T	249	HITZMAN D O	71	HOPKINS J	91	HULL K	198	ISENBERG H D	109	JENSEN N S	251	
HENNEY H R	306	HIXON D L	110	HOPKINS W J	40	HULTGREN S	187	ISHAK M	74	JENSEN S	103	
HENRICKSON K J	77	HJELM U	278		286	HULTGREN S J	304	ISHAQUE M	151	JENSEN T E	71	
HENRIKSEN F	309	HNATJUCK P	244	HOPPER C A	160	MULTMAN J	314	ISHIHAMA A	172	JEONG P	239	
HENRIKSSON A	250	HO B S W	275	HORII T	299	HUMBERT J	19	ISHIMOTO K	12	JEREB J	61	
HENRY E	30	HO D	236	HORIKOSHI K	15	HUMES R	255	ISRAELI E	290	JEREB C A	95	
HENRY M K	198	HO J	113		203	HUMPHREYS D W	236	ISTURIZ R	77		101	
HENRY S	158	HO J Y	146	HORN D	61	HUNG C	275	ITATA II C	250	JERNIGAN A	282	
	265	HOBAN D	124	HORN J M	188	HUNG P P	18	ITRICH N R	272	JERRIS R	66	
HENSEL E	235		285	HORN R	32	HUNG T	35	IUCHI S	156	JERSE A	53	
HENSENS O	104	HOBAN D J	278	HORN T	265	HUNTA A	58	IUGOVAZ I	173	JESSEE C B	77	
HENSEY D	285		304	HORNBERGER G A	100	HUNTER E	296	IIVACHTCHOOK O	28	JETT B D	245	
HENTGES D J	110	HOBAN D	304	HORNWITZ E	206	HUNTER S	275	IVANCIC J	241	JETT M	281	
HENTHORN K	271	HOBAN D	159	HORSBURGH C R	118	HUNTER T	265	IVEY D M	101	JIB B	278	
HENWICK S	11	HOBAN D J	118		80	HUNTER T	265	IIVINS B E	286	JIG G	27	
HERBERT A	70	HOBAN D	273	HORSBURGH C R	145	HUNTER T	265	IIVIN P C	74	JIANG P	79	
HEREDIA M L	202	HODGE A S	130		151	HUNTER S	275			JIANG S C	155	
HEREDIA-CERVANTES J	243	HODGE C N	161	HORSMAN G	285	HUNTER T	310			JIANG X	11	
HERITAGE J	31	HODGES R S	40	HORST M H	131	HUNTER W J	239			JILLY B	236	
HERMAN J S	100	HODGSON J	182	HORSTAEIER C D	234	HUO A	110	JABS D	236	JIM K	315	
HERMAN S	301	HODGSON W	302	HORWITZ M	14		201	JACEWICZ M	112	JIMENEZ A M	201	
HERMAN W E	12	HODINKA N E	159		27	HURLEY F J	315	JACKMAN J T	76	JIMENEZ E	242	
HERN S C	220	HODINKA R L	302	HOSKIN D	17	HURLEY R	173	JACKSON B	146	JIMENEZ S	33	
	163		302	HOSKINS J	247	HURST C J	136	JACKSON K M	145	JIMENEZ S	68	
HERNANDEZ B S	163	HODSON R E	203	HOSNY T	276	HURST S F	277	JACKSON L	123	JIMENEZ L	194	
HERNANDEZ D	107		203	HOSPENTHAL D	171	HURTZ D	75	JACKSON M	194	JIN G F	281	
HERNANDEZ J	165	HODSON-JARAMILLO	91	HOSTED T J	239	HUSAR S	305	JACKSON M P	35	JIN J Y	284	
HERNANDEZ L	158		300		251	HUSMANN L	287		12	JIN S H	237	
HERNANDEZ L A	208	HOFFMAN B	208	HOSTETLER P	30	HUSSAIN Z	30	JACKSON R J	246	JIN X	157	
HERNANDEZ R	110	HOFFMAN K	276	HOTTINGER H	308	HUSSEIN H S	276		246	JINHUI T	202	
HERNANDEZ-DELGADO	107	HOFFMAN P S	222	HOU Y	79	HUSSEIN V	305	JACKSON S	194	JINKS-ROBERTSON S	290	
		HOFFNER S	200	HOUCK H	158	HUTCHINSON C R	208	JACOB A E	177	JIRILLO E	284	
HERNDON B	245		200	HOUGHTON J E	117	HUTCHINSON N	22	JACOB E	121	JOBLING M G	281	
HERNDON D N	158	HOFFNER S E	278		157	HUTKINS R W	105	JACOB F	314	JOHANEI H	235	
	236	HOGAN D	278	HOUGLAND J K	159		232	JACOBS C	27	JOHANSEN K	111	
HERON I	286	HOGAN J	238	HOUNG H H	241	HUTSON J C	42	JACOBS D	311	JOHANSEN K A	197	
HERRERA P	39	HOGAN J J	201		273	HUTTON N	119	JACOBS M R	237	JOHN D T	25	
HERRERAS F	274	HOGAN L H	277	HOUBRIGAN J L	298	HUXSOLL D L	168	JACOBS W R JR	102	JOHN J F	61	
HERRERO L	158	HOGER S	247	HOUSTON A	235	HUYBRECHTS M M E	254	JACOBSON A	233		275	
HERRICK J B	34	HOGREFE W R	309		315	HYUGEN C	102	JACOBSON E S	54	JOHNSON A	281	
HERRMANN J L	37	HOHN T M	22	HOUSTON C W	281	HWA V	97	JACOBSON G	105		304	
HERSH B	205	HOIBY M	286	HOUSTON J A	11	HWANG C C	61		108	JOHNSON B	58	
HERSHBERGER C L	204	HOIBY H	286	HOVAN A	74	HWANG H	108		261		144	
	78	HOJKA K	273	HOVAY A K	41		116	JACOBSON R H	58		222	
HERSON D S	26	HOJKA K E	97	HOWARD D H	92	HWANGBO C C	145	JACOBY P M	107	JOHNSON B A	275	
HERWIG R P	26	HOLBEN W	267		120	HYAMS K C	57	JACQMAIN E	113	JOHNSON B T	19	
	248	HOLBEN W E	26	HOWARD M J	25		110	JACQUES M	303	JOHNSON C H	25	
HESELTINE P	235	HOLBRICK W M	227	HOWE B	243		162		305	JOHNSON D B	174	
HETHERINGTON S V	11	HOLDER V R	158	HOWELL A D	30	HYMAN A	237	JAEGER K	47	JOHNSON D R	247	
	247	HOLDER A A	152	HOWELL L W	34		244	JAEGER R	236	JOHNSON E A	702	
HEUSER J	314	HOLDER D	25	HOWELL M	208	HYMAN M	117	JAGUSTZYN-KRYNICKA	185		270	
HEWLETT D JR	61	HOLDER E L	154	HOWINGTON J P	107	HYMAN M R	117	E K		JOHNSON F D	41	
HEWLETT E	41	HOLDER I A	286	HOYLE B D	77	HYNES M F	313	JAMES G M	110	JOHNSON G	204	
HEWLETT L L	309	HOLDER P K	40	HOYT J A	290	HYNES S H	196	JAMES G T	278	JOHNSON G R	117	
	172	HOLDER FRANKLIN M	316	HOYT J C	251	HYNES W L	247	JAMISON R	176	JOHNSON H M	135	
HEYDUK T	218	HOLLADAY D	304	HRAFITZ M	69	HYRONIMUS I	196	JANCIK J	156	JOHNSON J A	278	
HIBBS J B JR	70	HOLLAND L L	300	HRUBY D	18	HYUN W C	97	JANDA W M	30		257	

JOHNSON J E	286		240	KAUR M	57	KHOSLA C	141	KNIGHT C	63	KNIE T A	77
JOHNSON J L	173	JUSTICE S	258	KAUWALA T M	181	KHOURY A E	238	KNIGHT P J	300	KRAMER C	276
JOHNSON J R	187			RAY W	304		243	KNIGHT S	122	KRAMER D	233
	304			KAYLOR B M	107		313	KNIPP G	121	KRAMER F R	307
	61			KAYSNER C A	115		290	KNOTT C	16	KRAMP J	283
JOHNSON J T	197				146	KIDAMBI S P	100	KNOWLES D	182	KRASINKOFF P A	309
JOHNSON K	171				202	KIEM T E	45	KNOWLES K	310	KRASNER R J	159
JOHNSON K E	272	KA J O	26	KAZAR J	228	KIHARA J	244	KNUDSON R L	20		229
	274	KAACK B	287	KAZARIAN K	173	KIKUCHI M	106	KNUTON S	221	FRAUSE D	308
JOHNSON L	244	KAACK M B	40	KAZUMI J	286	KIEBRIDGE J F	5	KOBAYASHI G S	76	KRAWCZYNSKI R	29
	271	KAAKE R H	154	KEANE C T	163	KILBURN J	61		234		57
JOHNSON L M	30	KAATZ G W	32	KEASLER S P	304	KILBURN J O	143	KOCABIYIK S	31	BRAWIAC S	31
	243	KADNER R	261	KEATH E	115	KILBY P J	200	KOCAGUZ S	237	BREDICH N M	312
JOHNSON M	303	KADURUGAMUWA J	31	KEAY S	38		215	KOCAGUZ T	237	KREISING J A	95
JOHNSON M C	308	KACAN T	309	KEAY S	296		312	KOCH A L	15	KREISWIRTH B H	243
JOHNSON M G	146	KAILASAM S	278	KEBRIAEI P	51	KILGORE G	285	KOCH E	286	KREITON R L	60
	205	KAIM S J	246	KEELAN C A	34	KILLIAN S	244	KOCH E	39	KRELL P J	106
JOHNSON M S	292	KAISSER A B	279	KEEN M	58	KILSTRUP M	204	KOCH G	104	KREMER J D	73
JOHNSON P	301	KALISH M	29	KEENER M	144	KILVINGTON S	152	KOCKA F	66	KREPEL C	313
JOHNSON P C	158	KALLANDER K	315	KEENLEYSIDE W J	158	KIM A Y	28		284	KREPEL C J	285
JOHNSON P J	201	KALLAT C	32	KEESLER G A	81	KIM B W	72	KOCKA F E	110	KRETZ P L	28
JOHNSON R	207	KALLENIUS G	200	KEEVIL C W	23	KIM D	240	KOEHLER B	161	KRIEVO L B	49
	206	KAMEI K	92	KEHL K S	39		783	KOEHLER T M	111	KRIEVE A	109
	285		277	KEIM L	34	KIM E	308	KOENIG A	40	KRISMER K	66
	w13	KAMICKER B J	268	KEISER J	39	KIM H I	156	KOENIG G	243	KRISHNAMOORTHY H	148
JOHNSON R C	87	KAMINSKI Z	145		150	KIM I	158	KOETH T	37	KRISTINSSON R G	301
JOHNSON S	310	KANDEL J	132		276	KIM I S	123	KOGA T	12	KRIVAN H C	103
JOHNSON S M	277		w6	KEISER P	296	KIM J	162	KOGOMA T	35		303
JOHNSON T	69	KANDEL J S	132	KEITH E S	274		67	KOGUT M H	146	KRONBERG G	121
JOHNSON W	287	KANE A	112	KEITH J M	41		115	KOH S	194		286
	70	KANE M D	63	KELLAM G E	35	KIM K S	27	KOHA M	279	KROPEC A	150
JOHNSON W D JR	151	KANENMOTO R	206	KELLER A	309	KIM M	227	KOHAN M J	315	KROPHSKI A M	307
	246	KANJIAL S	306	KELLER G	227		278	KOHLER R	212	KROPP H	104
JOHNSTON K H	131	KAO J	105	KELLER G H	46	KIM S	73	KOHN G	276	KRUEGER C	240
JOHNSTON S A	139	KAO M	161	KELLER J	202		200	KOHING L L	194	KRUEGER K M	41
JOHNSTON S L	282	KAPADIA S	311	KELLER N P	22	KIM S O	304	KOKAI KUN J F	281	KRUGER B	150
JOHNSTON W H	313	KAPATRAL V	70	KELLER R	206	KIM Y	108	KOKJOHN T A	155	KRUGER T A	105
JOIST J H	201	KAPCZYNSKI D R	40	KELLEY J	78	KIM Y W	248	KOKOLIS C	25	KRUMME M L	231
JOLLUCK J D	305	KAPER J	113	KELLEY T	315	KIMACK N M	205	KOLAEIS R M	308	KRUSSE D	131
JOLY B	77		221	KELLOGG J A	39	KIMBRO K S	306	KOLBERG J	265	KRUSSELL A	247
JONAH M M	181	KAPER J B	314		75	KIMMEL P L	742	KOLBERG J A	265	KRUSSE R	106
JONAS M	162		110	KELLOGG S T	130	KIMURA A	246	KOLENBRANDER P E	177	KRYWOLAP G N	240
JONAS R B	16	KAPIKIAN A Z	267		245	KINARD S	201	KOLIBACHUK D	27	KRYZCKI J A	7
JONAS V	286	KAPIL S	247	KELLY D	123	KINDER S A	69	KOLODRUBETZ D	225	KRYZCKI J A	73
JONAS TAGGART V	16	KAPLAN E L	266	KELLY S	113	KING C H	118	KOLSTAD R	256	KUENH M J	314
JONCAS J	300	KAPLAN G	196	KELLY S M	180	KING D	74	KOLTER R	260	KUEMPEL P L	87
JONES A P	29	KAPLAN H B	242		185		310		291	KUENEN J G	174
JONES B	61	KAPLAN J E	295	KELLY W	119	King K W	20	KOMATSU M	165	KUHLENSCHMIDT M S	47
JONES C	158	KAPLAN L	104		114	KING R	115	KOMISAR J	281		57
JONES D	309	KAPLAN L A	34	KELLY WINTENBERG K	7		202	KOMISAR S J	248	KUNNER C H	73
	162	KAPLAN M H	150	KELTJENS J	74	KINK J	302	KONDRACKI S	208	KUNTER J	51
JONES E	21		236	KEMMA M E	121	KINKLE B K	239	KONDRACKI C M	112	KUJARI H	309
JONES G A	249	KAPLAN R	w9	KEMPER C	151		290	KONG L	104	KUKOR J J	165
JONES H M	124	KAPLAN S	24	KEMPER C A	258	KINNER N	316	KONG Y L	104	KULPA C F	154
JONES J M	3		56	KEMPF M	227	KINNEY L	75	KONIG B	42	KUM W W S	112
	23		136	KEMPF M	227	KIRK L L	154	KONIG C	31	KUMAR A	201
	277		279	KENDALL K	196	KISH A	77	KONIG W	42	KUMAR B A	214
JONES K	104	KAPPERUD G	94	KENEALLY W R	15	KISKA D	275		287	KUMAR M A	165
JONES L P	80	KAPUR V	70		106	KISKA D L	35	KONKEL M E	181	KUNDSIN R B	68
JONES R	75		112	KENG T	173	KISSINGER R	62	KONOPKA A E	24	KUNG K	242
	235	KARALUS R	303	KENIG J G	304	KIST K	119		154	KUNG T	15
JONES R M	174	KARAM SARKIS D	235	KENIMER J C	30	KITAMURA K	242	KOOMEY J	246	KUNIMOTO D Y	201
JONES S	206	KARASUSKY HALL G	200	KENNEDY C	163	KITANO R	26	KOOMEY M	69	KUNST F	213
	244		276	KENNEDY K J	171	KITCHING D	77	KOONTZ F	75	KUNZ D A	79
JONES S H	228	KAREM K L	69	KENNEDY M J	286	KITTLE J D	79	KOONTZ J P	211	KUO C	212
JONES S W	242		205	KENNES C	248	KIYOSAWA H	79	KOOPMAN L B	115	KUO C C	122
JONES T S	51	KARICH T	245	KERBER L L	165	KJELLEBERG S	260		315	KUPERSZTOCH T M	197
JONES W	152	KARIM M R	151	KERBY R	56	KLAENHAMMER T	28	KOPECKO D J	113		281
JONES W J	163	KARJALAINEN T K	102	KERKERING T M	74	KLANN A	314		181		201
	155	KARKAS J	104		234	KLAPES N A	316	KOPEK J	235	KUPFER D M	28
JONES W K	138	KARIS R	35	KERNACKI K A	114	KLASCHINSKY S	111	KORB S	275	KURAMITSU M K	241
JONES-PARK L A	77	KARLSSON A	278	KERNODIE D S	279	KLASTERSKY J	77	KORBER D R	15		251
JONG S	37	KARLSSON S	301	KERNS L	159	KLEBA P E	197		250	KURATA H	119
JONSON G	304	KARMAU M	188	KERR E	310	KLEIN B S	277	KORGENSEI E K	301	KURICHA M	234
JONSSON A	97	KARNS J S	188	KERR K	30	KLEIN D A	316	KORICA Y B	30	KUREISHI A	217
JORDAN M	206	KAROW M	214	KERR K G	109	KLEIN J S	159	KORNACKER M G	95	KURITA N	275
JORDAN R L	57	KARP M	214	KERRY C F	305	KLEIN M	40	KORTH K G	194	KURITA S	234
JORGENSEN J	2	KARP M A	197	KESHAV K F	283		70	KORTH M A	12	KURITZA A	237
	170	KARPOWICZ E	202	KESSEL M	130	KLEIN T	17	KORUS R A	81		243
JORGENSEN J H	30	KARR S R	50	KESSLER E	42	KLEIN T W	17		154	KURMAN R	265
	76	KARUPPAYIL S M	131		114	KLEIMENS S P	137	KORY M M	117	KURODA K	102
	124	KASARENNI S	104	KESSLER P E	243		278	KOSEKI T	282	KURTZ J	162
JORGENSEN J J	85	KASATIYA S	194	KESSOUZ A	242	KLEMM P	304	KOSKINEN W C	239	KURTZ M	76
JOSEPH A	257	KASE J A	205	KETCHUM P A	165	KLESPIES S L	206		290		104
JOSEPH J M	242	KASELIS M	171	KEUDELL K	272	KLICPER R	66	KOSTER F	185	KURTZ M M	104
JOSEPH S	280	KASLOW H R	281	KEUDELL K C	240		75	KOSTIAINEN T	246	KURTZMAN C P	47
	310	KASPER D	245	KEUNING S	248	KLIEMPEL K R	41	KOSTKA J	203		240
JOSEPH S W	208	KASPER D L	246	KEUSCH G	112	KLUMP K R	198	KOTANI H	28	KURUP V	201
	275	KASSIM O	152	KEUSCH G T	112	KLINE B C	60		68	KURZ B W	305
	315	KASSIM O K	247	KEYHANI A	76	KLINE E L	246	KOTB M	41	KUSHER D	277
JOSEPHSON K L	25	KASUGA H	281	KHABBAZ R	242	KLING D E	303	KOTHARY M H	112	KUSHIDA K	162
	139	KATES M	80	KHATHIB T	284	KLINGMAN K L	278		78	KUSHNARYOV V	281
JOSHI V R	32	KATHARIOU S	70		290	KLINGMANN S	150	KOVACH L E	12	KUSTRITZ J	78
JOST K C JR	200	KATO C	203	KHALSA A Y	119	KLUK B	30	KOVACH M	24	KUTTER E	214
JOST K JR	284	KATO N	299	KHAMBATY F M	115	KLOOS W E	77	KOVAL S F	196		271
JOSTE M	68		242		154		245		250	KUYKENDALL L D	239
JOU J	283	KATZ E D	58	KHAN A A	163	KLOFFENSTEIN W	272	KOWALCHUK G	157	KUYKENDALL R J	38
JOUVE M	314	KATZ J	121		145	KLOTZ S A	131	KOWALCZYK M	284	KUZHANDAIVELU N	108
JOYCE E	238		22	KHAN M B	46	KLUG M J	316	KOWALCZWSKA K	309	KYVENBERG J	65
JOYCE E A	139	KATZ L	194	KHANNA C	121	KMIEC E B	28	KOZLOWSKI L	25	KWAN C	283
JOYNER R	66	KATZ S E	195	KHANNA A	282		312	KRAFFT A E	41	KWAN H S	232
JU T H	164	KAUFFMAN R M	247	KHANNA S	204	KNABEL S	21	KRAFT J	285	KWASNIK I	309
JUANG Y L	35	KAUFHOLD A	38	KHABAZI A	121	KNACKMUS S J	154		14	KWOK R	109
JUDD A K	239	KAUFMAN L	234	KHARODI N	120		188	KRAHENBUHL J	222		275
JUNG S W	240		316		235	KNAEBEL D B	316	KRAHENBUHL J J	222	KWOK S	159
JUNGKIND D	243	KAUFMAN M G	32	KHATIB G	29	KNAPP C	244	KRAHNSBURG E	276		201
JUNGKIND D L	211	KAUFMAN S	275	KHATIB R	29	KNAPP R M	136	KRAJDEN M	119	KWON B S	287
	301		122	KHOSHMAN M A	152	KNAPP V C	204	KRAJEWKA PIETRASIK D	246	KWON CHUNG K J	28
JURTSCHUK L	240										220
JURTSCHUK P JR	173										131

KYLE D	76	LASKER B A	38	LELAND D S	119	LONNIES H	95	LYMAN C A	92
		LASSITER M O	273		159	LONON M R	108	LYN K	36
		LASTOVICA A	287		309	LOOAREESUWAN S	312	LYNCH W	286
		LATGE J	180	LEMAISTER C	150	LOORABAUGH A	104	LYON J D	281
		LATHÉY J	242	LEMKE P	241	LOOMIS L	35	LYONS M	145
		LATIMER J L	303	LEMONTE A M	122	LOOMIS W	202	LYTE M	15
		LATINWO L M	71	LENKE H	154	LOOMIS W	249	LYTE M S	34
L'ESPERANCE D M	276	LAU B H S	17	LENNOX J	216	LUNDE L	73		
LAAKSO S	214	LAUGHLIN T	28	LENNOX J E	132	LUNDEN P	235		
LAATSCH L	91	LAUNOIS P	72	LENSKI R	292	LUNDENBACH B D	73		
LABBE M	310	LAUPLAND K B	102	LENTINO J	243	LUNDER L E	197		
LABBE R	202	LAURIE K	112	LENTINO J R	235	LUNDGREN P	246		
LABBE R G	202	LAUWERS S	121	LENZ R W	272	LUNDGREN S W	112		
	258		110	LEOGRANDE G	284	LUNDHOLM LEVY P	278		
LABEDA D P	173	LAVALLEE J	281	LEONARD A	72	LUNDER L E	12	LOPEZ A	235
LABOMBARDI V J	244	LAVELL G	32	LEONARD B A B	245	LUNDMARK D G	81	LOPEZ C	68
LABRO M T	11	LAVELLE L	97	LEONARD J T	239	LUNDO E S	4	LOPEZ J	202
LABROUSSE V	278	LAYOIE S	194	LEONARD R B	30	LUNDQVIST S	27	LOPEZ L A	71
LACEY D L	277	LAW E	162		145	LUNGWAY D F	157	LOPEZ P	164
LACEY R W	30	LAW S W	31	LEONARDO M	205	LUNSEY R	37	LOPEZ BERESTEIN G	76
LACEY L	248	LAW W	69	LEPLEY R A	241	LUNSEY R	37	LOPEZ DE VICTORIA G	34
LACROIX M	300	LAW W W	286	LEPP P W	203	LINDSLEY M D	310	LOPEZ GONI I	111
LADAPO J A	73	LAWRENCE J R	15	LEPLIA S H	41	LING W	195	LOREBACH J	315
	163	LAWRENCE T	250	LERESCHE M	235	LING Y	265	LOREBACH S C	174
LADDAGA R A	241		126	LERNER C A	120	LINGENS F	165	LORENZ D	204
LAFLEUR B	255		206	LERNER S G	31	LINGWOOD C	112	LORENZ E	199
LAGACE J	42		236	LERNER S C	127	LINTERMANS P	113	LOREZAN V	77
	286		244	LERNER S G	237	LINKE M J	304	LORINCZ A	158
LAGERGARD T	112		72	LESKYS A	206	LINSOOTT A	204	LOROWITZ W H	238
LAI E	35	LAWYER F C	282	LESNIEWSKI R R	86	LINTERMANS P	113	LORTIE L A	281
LAI M	224	LAYTON A	61	LESSE A	303	LINZ J E	22	LORY S	12
LAI M C	73	LAYTON M C	158	LESSIE T G	164	LIOH H	281		
LAI W	147	LAZAROWITZ S	294	LESSNICK S	42	LIU J W	115		
LAI W C	144	LAZAZZERA B	312	LETARTE R	41	LIU J	242		
LAINÉ P S	166	LAZO DE LA VEGA S	235	LEUNG H C	232	LIU J W	115		
LAKSHMANAN M	28	LAZZERONI C	160	LEUNG J	107	LIU J	242		
LAL R	242	LE GASSIC K	310	LEVENGUOOD S K	197	LIPSON S M	150		
LAM H	251	LE MAGREX E	111	LEVESQUE R C	5	LISS S	236		
LAM J	31	LE NOC P	66		37	LIST D	107		
LAM J S	207	LE NOY D	111	LEVINE D	109	LISTER P D	245		
	258	LEAHY D	302	LEVINE M M	4	LITCHFIELD C D	78		
LAM K	238	LEAKE R A	34		12		148		
	287	LEATHERS T D	153	LEVINE R P	121		W3		
LAM Y	104	LEBAR W	206	LEVITZ S M	171	LITTLE B	23		
LAMAGDELINE M	107	LEBAR W D	244	LEVY A	77	LITTLE J R	304		
LAMALVA J	300	LEBEL P	244	LEVY H	75	LITTLE L M	W19		
	302	LEBLANC B	177	LEVY J S	64	LITTLE R J	287		
LAMAN H	246	LEBLANC D J	241	LEVY L	57	LITLEDIKE E T	315		
LAMB A	275		252	LEVY S B	32	LITVAK L	68		
LAMBERT K	39	LECHEVALIER M P	236	LEW D P	279	LITVAK S	68		
LAMBERT L	227	LECHEVALLIER M W	244	LEWIS B	18	LITWIN C M	111		
LAMBLIN A J	312	LECLERC S	78	LEWIS C	301	LIU C	37		
LAMBLIN G	114	LECOURS N	37	LEWIS D	66		205		
LAMMERT J	216	LEE A	102	LEWIS D L	162	LIU J	247		
LAMMERT J M	43	LEE B	274	LEWIS J E	273		115		
	210	LEE B D	272	LEWIS J W	236	LIU M	251		
	288	LEE C H	12	LEWIS L A	273	LIU P	113		
LAMMIE P J	152	LEE C J	247	LEWIS L K	205	LIU R	62		
LAMONT R J	201	LEE C Y	257	LEWIS M J P	275	LIU S	110		
LAMOTHE F	285	LEE F	165	LEWMO M J	66	LIU S T	117		
LAMPEL K A	115	LEE H	108	LI D	78	LIU T H	195		
LANCASTER M	244	LEE J W	171	LI J	35	LIU V C	265		
LANCASTER V	281	LEE K	196	LI J	37	LIU Y	12		
LANCE A	77	LEE L	34	LI M	166	LIU Z	39		
LANCZ G	62	LEE L N	241	LI N C	119	LIVDAHL C	77		
	77	LEE L Y	265	LI Q	69	LIVERMORE D M	295		
LANDA A S	117	LEE M	171	LI S Y	81	LIVRELLI V	305		
LANDAU W	66	LEE M C	207	LI X L	81	LJUNGDAHL L G	81		
LANDAY A	159	LEE M F	159	LI Y	106		106		
LANDER D	243	LEE R C	154	LI Z M	201	LJUNG A	304		
LANDGRAF M	115	LEE S	304	LIANG Z	198	LLOSA J	75		
LANDRE P A	72	LEE S C	302	LIANGOU P	242	LLOYD D	152		
LANDRY F	300	LEE S F	106	LIBBY S	113	LLOYD M	123		
LANDRY M L	150	LEE S G	18	LIBERTIN C R	39	LO D	18		
LANDRY W	310	LEE S H	78	LIDSTER W	159	LO P	311		
LANDRY W L	194	LEE S Y	245	LIEBERT C	29	LO R Y C	112		
LANDUYT S	62	LEE T	200	LIEBART C	290	LO S	164		
LANE D J	73	LEE Y T	217	LIEBET C	273		257		
LANE E M	162	LEE W K	198	LIEBAU A	104	LOBB C J	45		
LANE T	258	LEEDS J	113	LIESCH J	207	LOBEL S	68		
LANE T E	92	LEEF M F	36	LIGHTFOOT J	207		199		
LANG D	60	LEFEBVRE J	207	LIGHTHART B	290	LOBEL S	121		
LANG F J	80	LEFEBVRE R B	51	LIGON P J B	108		39		
LANG E C	117		144	LIGON P J B	286	LOBELLE RICH P A	75		
LANGER M	107	LEGARZA G	206	LIM C	108	LOBOS J H	57		
LANGFORD M P	121	LEGLISE P	93	LIM D V	194	LOCHT C	12		
LANGLEY K M	282	LEHKER M W	152	LIM S D	246		41		
LANGLOIS T	150	LEHMAN R M	272	LIMA A M	200	LOCKLEAR J	304		
LANKA E	36	LEHMANN P F	38	LIMBERGER R J	281	LODER S	115		
LANNIGAN R	276	LEHNER A	57	LIMMONE F	51	LOFTUS A	70		
LANTZ S E	304	LEHNER FOURNIER J	206	LIMBERGER R J	159	LOGAN S M	17		
LANTZ S E	60	LEHRE R I	287	LIN A	285	LOH P	29		
LANZA A	68	LEHTONEN L	119	LIN A W	146	LOH P C	29		
		LEHTONEN O	119	LIN C	106	LOMBARD K	78		
LANZA G R	163	LEIBENGUTH K C	284	LIN C K	274	LOMBARDO J	145		
LAO G	106		37	LIN C L	115	LOMBARDO M	156		
LAPIERRE S	16	LEIBOWITZ M J	208	LIN C S	28	LONDON J	177		
LAPPIN-SCOTT H M	313	LEININGER E	304	LIN D	164	LONDREY K L	195		
LARAQUE F	102		208	LIN D T	38	LONG E G	45		
LARKIN J M	34	LEINONEN M	122	LIN E C C	76	LONG S	48		
LAROCCO M T	275	LEITCH C	66	LIN H P	156	LONG S R	90		
LAROCHE S	155	LEITCH G J	152	LIN J	69		35		
LAROCK P	201					LONGFIELD R	195		
LARONE D H	W13						30		
LAROSE C	5								
LARSEN R	171								
LARSEN S	309								
	300								
	309								
LARSON J L	241								
LARSON M	196								
LASBY B	161								

MALINS T	75	MARTIN D H	279	MCCLANE B A	281	MCPHEARSON R M	228	MICHALISZYN E	160	MIXTER MATNE K	5
MALINVERNI R	158	MARTIN D W	70	MCCCLARY G A	122	MCPHEARSON J	63	MICHALSKI J	92	MIYAJI M	234
MALLARY L	284	MARTIN E	150	MCCCELLAND M	164	MCQUEEN C	185	MICHELSKI J	281	MIYASAKI K	77
MALLAVIA L	123	MARTIN I	104	MCCLESKEY F	201	MCQUEEN N	29	MICHEA HAMZENPOUR	174	MIYASAKI K I	287
MALLAVIA L P	123	MARTIN J A	108	MCCONNELL M M	305	MCQUEEN T J	76	M		MIYASHIRO D	235
MALLETT C	58	MARTIN J W	234	MCCORMACK W M	305	MCSORLEY C A	63	MICHEL J L	208	MOBASHERY S	31
MALLETT C P	40	MARTIN M	235	MCCORMICK N G	316	MCTEAGUE M	285		246		237
MALLINSON E T	315	MARTIN N L	197	MCCORMICK S P	22	MCVAY C S	41	MICHELSEN P	277	MOBLEY H L T	42
MALLOY D C	62		258	MCCOWEN S M	161	MCVEAN S	198	MICHELSON J D	74		187
MALLOY P J	39	MARTIN P A W	162	MCCOY H E	246	MCVEY M	115	MICUSAN V V	202	MOBLEY L T	32
	120	MARTIN P R	165	MCCRACKEN G H JR	286	MCWHINNEY D R	42	MIDDLENDORF L	164	MOCHALES S	104
MALONE J D	110	MARTIN R G	27	MCCREA K M	314	MEADE B D	709	MIDDLEBROOKS B	278	MOCK R C	92
MALONEY N J	41		83	MCCREEDY B	242	MEADE J C	38	MIELZYNKA J	153	MODERN P A	112
MALOQUIN F	295	MARTIN S	286	MCCUNE A K	42	MEADE M J	153	MIETZNER T A	97	MODLIN R L	186
MALOY S R	27	MARTIN S A	58	MCCUNE J	238	MEAGHER M M	272	MIGNEAULT P C	66	MODRZAKOWSKI M C	201
MALTER J S	29		79	MCCUNE J H	254	MEANS E G	167	MILCK C	237	MODUN B	111
MAM S	214	MARTIN VERSTRAETE I	213	MCCURDY A R	249	MEDICH D	287	MIKAEIAN L	284	MOGHADDAS J	276
MANAVATHU E K	131	MARTINERIE C	28	MCCUSKER J H	131	MEDINA RUEDA W	110	MIKAMI Y	234	MOGHADZEM S L	112
	237	MARTINETTI G	275	MCDADA J	259	MEEHAN J T	113	MIKELL A T JR	139	MOHAMMED S	158
MANCH-CITRON J	177	MARTINEZ B	25	MCDANIEL D O	246	MEEKS E	29	MIKESELL M D	116	MOHLA C	110
MANCINELLI R L	80	MARTINEZ L	234	MCDANIEL L S	246	MEGANATHAN R	293	MILER C	237	MOHN W W	163
	130	MARTINEZ R	75	MCDANIELS A E	153	MEHTA A	32	MILNER C	300	MOHR C D	70
MANCLARK C R	201	MARTINEZ R D	276	MCDERMID K P	245	MEHTA N	200	MILHOTIS M D	112	MOIRAGHI A	40
	286	MARTINEZ LAGUNA Y	79	MCDERMOTT J B	26	MEHTA R T	154	MILLAN J	107	MOJENA M	104
MANCUSO G	289		280	MCDERMOTT L A	237	MEHTA S	268	MILLER B	165	MOK T	31
MANDEL K L	300	MARTINEZ-PALOMO A	152	MCDONALD F	206	MEHTA R T	76	MILLER C	172	MOLINA A	158
MANEWEWANNAKUL K	36	MARTINI I	241	MCDONALD T	121	MEHTAR S	32		256	MOLINA F I	37
MANEVAL D	314	MARTINO T	281	MCDONALD W G	241	MEIER F	275		301	MOLINA M	78
MANEVAL D R	12	MARK C E	39	MCDOWELL C	150	MEIER F A	276	MILLER C E	71	MOLITORIS E	31
MANEZ R	235		151	MCDUFF R	12		39	MILLER C G	156		124
MANGANELLI R	185	MASON T J	285	MCELHANEY-FESER G	120		275		197		246
MANGANIELLO-	285	DUBOIS A	159			MEINERSMANN K J	297	MILLER C I	70	MOLLERACH M	250
MANGELS J	W14	MASSEY V	165	MCELMEEL M L	30	MEINZ M	310	MILLER D W	78	MOLLET B	308
MANHOFF D T	206	MASSON J	272	MCEWEN S A	124	MEJIA J P	104	MILLER E S	271	MOLLOV D	275
MAMI N	247	MASTERS H B	159	MCFARLAND B	282	MEJIA G I	27	MILLER G	248	MOLLOY S S	41
MANIAS D	36	MASURE H R	247	MCFARLAND C R	244	MEKALANOS J	4		279	MOAMANY M	120
MANILOFF J	199	MATAR G	310	MCFARLAND L	286	MEKALANOS J J	312	MILLER G R	220	MONCRIEF S	241
MANN L M	66	MATERS A	309	MCFEETERS R F	308	MELANDE R	273		236	MONDAL D	306
	310	MATHER E	301	MCFETERS G A	59	MELAUGH W	303	MILLER J M	62	MONDECAR M	154
MANN R	265	MATHERS A	5		107	MELDRUM J R	155		30	MONDELLO F	60
MANNING J A JR	194	MATHEW A G	312		162	MELISH M	244	MILLER L	198	MONDELLO F J	26
MANNING J F JR	155	MATHEWS H L	92	MCGAREY D J	238	MELNICK A	190		234	MONDRAGON A A	32
MANSIKKA A	309	MATIN A	260		194	MELNIX C	257	MILLER L A	254	MONGET D	30
MANTIA A A	156	MATSEN J	39	MCGAVIN M J	304	MELNO OLIVEIRA R	254	MILLER M	229	MONGOLD J	88
MANTLE M	305		110	MCGEE C D	246	MELOCHE M	254	MILLER M E	7	MONROE K M	246
MANZANO L	236	MATSON D O	57	MCGEE D	107	MENAWAT A	286	MILLER P	255	MONTAG N	77
MANZELLA J P	39	MATSUDA L	244	MCGEE K	25	MENAWAT A S	268	MILLER R	150	MONTAGNIER L	253
MANZOR O	242	MATSUMOTO M	109	MCGEE K	198	MENACACCI A	286		206	MONTANDON A	158
MAPES A	144	MATSUOKA H	119	MCGEER A	39	MENDELMAN P M	286	MILLER P	37	MONTANEZ C	283
MAPES T	280		234		236	MENDOZA J	158	MILLER R	110	MONTENAGNO C D	155
MAR V	41	MATSUYAMA A	106	MCGINNIS HILL E	305	MENDOZA K	110	MILLER R M	74	MONTGOMERY J	110
MAR V L	281	MATTAR S	110	MCGINNESS M R	74	MENDOZA L	131		26	MONTGOMERY M T	95
MARAHIEL M A	205	MATTER L	158	MCGOUGH D A	234		277	MILLER R V	116	MONTICELLO R A	105
MARASISAN M	110	MATTHEAKIS L C	41		74	MENEGUS M A	66		155	MONTIE T C	114
MARCEL J	75	MATTHEWS J D	151	MCGOVERN T	234		284	MILLER S	290	MOODY J	109
MARCH P E	157	MATTHEWS J S	236		159	MENESES S	110		113	MOODY M	236
MARCHAND M	301	MATTHEWS-GREER J	176	MCGOVERN V	309	MENN F	63	MILLER S I	286	MOODY P	74
MARCHESI F	158	MATTHYSSE A G	161	MCGOWAN J E JR	312	MEMON A L	165	MILLER T	113	MOORE B	66
MARCHESI M	200	MATTINGLY S J	114		66	MENON F D	204		17	MOORE D F	36
MARCHIARO G	62	MATUSSON D	232	MCGOWAN K	75	MERCER B	111	MILLER V	239	MOORE D G	206
	249	MATURIN P	235	MCGOWAN K L	134	MERCIER J	301	MILLER V L	181	MOORE G A	79
MARCHIN G	81	MATZNER P	244		119	MERCURIO V L C	162		187	MOORE J	301
MARCON M J	44		302	MCGRATH S	281	MERCURE L	201	MILLIGAN J	181	MOORE L	11
MARCONI P	245	MAUPIN J A	204	MCGREGOR J	152	MERGEAY W	29	MILLIGAN J A	104	MOORE M	268
MARCUS F	40	MAURER J J	207	MCGROARTY E J	197	MERGEAY W	79	MILLIGAN T W	315	MOORE M A	198
MARGARITA D	79	MAURY L	16	MCGURK S	316	MERKEL G J	315	MILLS A L	313	MOORE N J	155
MARGOLIN A B	155	MAXWELL A	182	MCHENRY M C	265	MERLIN T	120		100	MOORE N L	79
	228	MAY A	66	MCINERNEY J	216	MERLIN T L	66		203	MOORE R	275
MARGOLIN W	196	MAY H D	304	MCINERNEY M J	15	MERMEL L	30	HILLS D	233	MOOS M JR	177
MARIANO M	315	MAY L L	26		15	MERMEL L	75	HILLS J	233	MORA DE PINDAK M	152
MARIN D	227	MAY R J	315	MCINTIRE J T	33	MERMELSTEIN L	232	HILLS K	276	MORA J	90
MARINKOVIC P	79	MAY T B	26	MCINTOSH K	162	MERRQUIOR V L C	243	MILSTEIN S	185	MORAN C	149
MARINO M	279		165	MCINTOSH M A	197		247	MILTON D	42	MORAN E	299
MARKHAM B G	302	MAYAGOITIA G	299	MCINTOSH M	163	MERCURE L	113	MIMMS L	113	MORAN M A	203
MARKOVIC M	201	MAYER C M	68		159	MERRITHUEW D	39	MIN C H	28	MORCK D W	245
MARKOVIC M J	155	MAYER F	24	MCINTOSH K	35	MERTZ P	311	MIN D J	107	MOREE M	123
MARKOWITZ N	242	MAYER F	24	MCINTOSH M	99	MERUELO D	133	MINCK R	240	MOREHEAD M C	154
MARKOWITZ S	31	MAYERHOFER L	80		111	MERZ C S	276	MINER R	265	MOREHEAD M C	77
MARKS A L	34	MAYFIELD J E	69	MCINTOSH M A	199	MERZ W G	3	MING-LEE S	25	MORELLO J	66
MARKS G L	123	MAYHALL C G	134	MCINTOSH M	197		13	MIMION C F	20	MORELLO J A	1
MARKS I N	287	MAYHALL G	134	MCINTYRE D	241	MESBAH M	73	MIMION F C	199		66
MARLATT F	192	MAYO D	242	MCIVER K S	114	MESSELSON M S	168	MINNICH S A	70	MORAN C	85
	315	MAYO J	308	MCIVOR K L	123	MESSENGER K	301	MINNICH H A	285	MORAN E	201
MARLER J K	236	MAYO M S	313	MCKAY L L	308	MESSER R J	281	MINNING-WENZ D	107	MORFIN-OTERO R	243
	242	MAZE C	160	MCKEOWN A	39	MESSICK J	246		246	MORGAN J W	242
MAROLDA C L	257	MAZENS-SULLIVAN M	124		236	MESSNER T O	123	MINSHEW B H	234		302
MARONE P	61		247	MCKIBBEN L A	79	MESSERER T O	201	MINTZ C S	69	MORGAN M A	201
	287	MAZUREK G	137	MCKINLEY V	139	MESZAROS A	30	MIRAGLIOTTA G	287	MORGANROTH J N	244
MARQUIS R E	105	MAZUREK G H	16	MCKINLEY V L	139	METCALF E S	113	MIROCHNITZENKO	283	MORGENSTERN D	287
	215		200	MCKITRICK J	276	METCALF W W	197	O		299	
MARRACINO R K	95	MBUY G N K	158	MCLANDSBOROUGH L	308	METCHOCK B	16	MIRONOV A	108	MORISSET R	295
MARRINAN J	76	MCAFFEE R	785				16	MISCHKE S	75	MORISSET R	18
	104	MCALLISTER W T	149	MCLAUGHLIN D	38	METCHOCK B G	145	MISHRA S K	284	MORIUCHI H	18
MARRS C	304	MCAVOY D C	272	MCLAUGHLIN J	235	METGE D W	75	MISKIN A	39	MORIUCHI M	18
MARRS C F	314	MCCAGUE R	64	MCLAUGHLIN J C	30	METZGER D	162	MISRA R	197	MORIWAKI K	37
MARSDEN J	65	MCCALLUM K	203		44	METZGER D	242	MISRA T K	27	MORRELL R	59
MARSH R F	298	MCCANN N L	81		75	METZMANN E	300		312	MORRIS A	77
MARSHALL D	311	MCCARDELL B A	112	MCLAUGHLIN L	38	METZBERG R	174	MISRA V	18	MORRIS A J	151
MARSHALL D L	249	MCCARTER Y	124	MCLAUGHLIN R	303	MEUNIER J A	112	MITCHELL B M	29	MORRIS A J	285
MARSHALL G J	250		242	MCLAURIN D	302	MEUSER R U	122	MITCHELL J	303	MORRIS J G JR	257
MARSHALL G R	41	MCCARTHY C M	151	MCLEAN T I	61	MEWHINNEY M	144	MITCHELL J L	303	MORRIS L C	120
MARSHALL S	5	MCCARTHY D	28	MCLEAN RIGGS H J	75	MEYER J	278	MITCHELL P	109	MORRIS M	150
MARSHALL W	245		72	MCMANUS A T	109	MEYER J P	144	MITCHELL P S	198		276
MARTENS M	97		77	MCMANUS C	240	MEYER R	301	MITCHELL R	71	MORRIS S	107
	279	MCCARTHY P J	76	MCMILLAN W	300	MEYER S A	166		139	MORRIS T	277
	304	MCCARTHY S	191	MCMILLAN L	222	MEYER S A III	120	MITIN A	35		237
MARTENS-DURING B	300	MCCARTHY S A	228	MCMURRAY D N	276	MEYERS H	242	MITSUI A	165	MORRISSEY A B	39
	309	MCCARTY P	148	MCNALLY C	222	MEYERS L S	302	MITTELMAN J	25	MORRISSEY P J	160
MARTIN A	296	MCCARTY P L	195	MCNAMARA A	111	MEYERS S I	50	MITTELMAN M	23	MORRISON C J	54
	308	MCCAY S G	202	MCNAMARA A B	276	MEZZARI A	234	MITTELMAN M W	194	MORRISON S	104
MARTIN A K	108	MCCLAINE L	300	MCNAMARA D B	159	MICHEALEK S M	39		238		39
MARTIN D	207		309	MCNEIL M	287		58	MITTLER J	292		16
	257	MCCLAINE M S	273		74		121				

MORRISSEY R F	93	MUSSIN E	113	NEWMAN F	29	O'CAIN P	28	245	PALUMBO A V	194
MORROW J	290	MUSSO R	273	NEWMAN K E	249	O'CALLAGHAN D J	18	285		248
MORSE D L	169	MUSSOT C	42		311		140	311		W2
MORSE S A	97	MUSTACHI B	236	NEWMAN S	92		158		PALUMBO S A	115
MORTENSEN J E	119	MYER R	15	NEWNHAM P	36	O'CALLAHAN C	280	104	PAN S	37
	303	MYERS C R	197	NEWTON A	95	O'CONNOR S	173	104		171
MORTENSON L E	165	MYERS J M	197		258	O'DONNELL E	244	242	PANACCIONE D C	22
	34	MYERS S	242	NEWTON C	17	O'DONNELL K L	47	278	PANCHOLI V	246
MORTON D	228	MYERS S	130	NEWTON P III	48	O'DONOYAN G A	204	121		247
MORTON D J	111	MYVETT D	276	NG E	217		251	OPARA Q	PANCORBO O	313
MORTON T M	36			NG V L	119	O'HARA C	30	121	PANEZUTTI H	40
MOSCA A	287			NG W	79	O'HARA C M	30	107	PANG Y	200
MOSCI P	286			NGELEKA M	304	O'HARA L C	198	178	PANIGRAHI P	257
MOSELEY S	280			NGUIYEN J	285	O'HERRIN S M	15	313		286
MOSELEY S I	12			NGUYEN A H	102		106	237		304
	295	N'DIAYE M	102	NGUYEN H	237	O'LOUGHLIN E	195	109	PANISSE J	62
MOSER G P	294	NACHAMKIN I	110	NICHOLS W S	201	O'MULLAN P	106	237	PANJWANI N	152
MOSER L E	277		243	NICHOLSON A W	157	O'NEILL D	75	245	PANSEGRAU W	36
MOSER S A	277	NACHNANI S	31	NICHOLSON M A	110	O'NEILL J C	156	257	PANTOUANIO M W	104
MOSLEY C S	156	NACY C	286	NICHOLSON R	306	O'NEILL K R	228	101	PAO C C	284
MOSS C	145	NACY C A	178	NICHOLSON V	277	O'QUINN K	236	254	PAOLI G C	251
MOSS N S	173		287	NICKEL J	286	O'REGAN M	241	266	PAPADOPOULOS M	242
MOSS W	173	NADALA E	29	NICKELS J T JR	81	O'ROURKE J	37	102	PAPARELLO S	110
MOSSER D M	92	NADLER H	244	NICKERSON C A	35	O'ROURKE S V	243	145	PAPAYASSILIOU I	242
MOTES M	228	NAESSENS A	110	NICOL E	302	O'SULLIVAN F	287	222	PAPAVASSILIOU J	32
MOTES M L	115	NAGAR M	311	NICOLAU D P	245	O'TOOLE G A	290	314	PAPERMASTER S	29
MOTHA A	127	NAGAR-ANTHAL K R	73	NICOLE M	78	OAKS E V	305	28	PAPOUTSAKIS E	232
MOTYL M	274	NAGARAJA T	112	NICOLET J	110	OAKS S JR	123	157	PAPOUTSAKIS E T	232
MOULD S J K	72	NAGASAWA T	64	NICOLLE L E	304	OBATA T	165	204	PAPPAGIANIS D	277
MOUNT D W	205	NAGASHUNMUGAM T	306	NIE L C	144	OBEDEANU N	131	117	PAPSIDERO L	242
MOUNTZOUROS K T	40	NAGLE D P JR	73	NIEBAUER M L	97	OBEGI I	29	119	PAQUETTE G	155
MOURAD A	280		238	NIERLICH D P	283	OBENHUBER D C	139	107	PARADIS E	161
MOY B	197	NAGLE N J	188	NIERMAN W	164	OBIAS A	39	155	PARADISE L J	77
MOYER R W	140	NAGY B	304	NIERZWICKI-BAUER S	231	OBRIIG T	112	310	PARADKAR A S	106
MRAKOVIC I	195	NAIDU P S	251	NIES D H	204	OCAMPO C	91	62	PARALES J	51
MUDER R J	217	NAIK R R	165	NIES L	76	OCAMPO-FRIEDMANN R	130	39	PARALES R E	117
MUELLER J G	19	NAIR J	102	NIESEL D	241			75	PARANCHYCH W	40
	60	NAKAMURA L	240	NIETZI C	121		173	29	PARASASSI T	68
MUELLER J P	215	NAKANO E	106	NIEVES R A	106	OCCI J L	106	106	PAREK M	274
MUGANDA P	158		197	NIGHTINGALE C H	245	* OCHSNER P E	245	107	PAREKH R	308
	306	NAKANO M	17	NIINIKOSKI J	119	ODDS F	180	70	PAREKH S	153
MUH U	165		35	NIKOLOV Z L	274	ODDS F C	234	240	PARENT J	307
MUI L	75		162	NIULIS A	51	ODENYO A A	316	159	PARESH T	102
MUKHERJEE A	72	NAKANO Y	251	NISSON L	112	ODUGBEI T	281	40	PARISI I	257
MUKHOPADHYAY D	27	NAKAS J P	106	NINET B	202	ODFINGER P E	150	110	PARK C E	202
	312		153	NIROOMAND F	146	OEHMER M	237	280	PARK C H	110
MUKHOPADHYAY S	205	NAKAYAMA K	37	NISHIMURA S L	119		243	113	PARK E	108
MUKKADA A J	306	NALINA K R	28	NISHINO S F	154	OELSCHLAEGER R	109	41		250
MULAMBA G B	158	NALLIN M	104	NITTERAUER J D	117	OELSCHLAEGER T A	181	246	PARK H	181
MULBERRY G	W7	NALLIN OMSTEAD M	104	NITZ S	66	OESTERLE A	304	77	PARK J	123
MULBRY W W	33	NANNEY D L	37	NIU H Y	113	OFEK I	287	29	PARK S J	156
	117	NARANG S	240	NIYARD J	39	OGGIONI M R	185	273	PARKER A	5
MULLER E	245	NARANJO R	152	NIVENS D E	139	OGLE J	84	70	PARKER J	157
MULLER K	304	NARAYAN A D	154	NIXON C	285	OGRAM A	267	78	PARKIN T B	255
MULLER M M	197	NASER S A	151	NJUFOM S	110	OGUMA T	106	207	PARKINSON A J	62
MULLER V	73	NASSOS P S	151	NOBLE P A	194	OGUNSEITAN O A	28	251		198
	105		243	NOBLE R	203		65	150	PARKS L W	81
MULLIGAN M	109	NATARO J P	314	NOLD S	238		71	270	PARR T R JR	171
	275	NAU J	165		248	OH D H	249	145		295
	286	NAUMAN K K	62	NOLL J	25	OH K	119	309	PARRA C	113
MULLIN D A	35	NAUMAN R K	62	NOLLING J	73		234	234	PARSEK M R	163
MULLINS C	31	NAUMQVITZ D	206	NOLTE F	16	OH Y	116	77	PARSONNET J	112
MULLINS D E	195	NAUSCHUETZ W	30		66	OH YEMENG K A	124	280	PARSONS L M	69
MULLIS K B	252A		206		295	OHMAN D E	42	177	PARTAL Y	75
MULLIVORE R	259		244	NORBERG R	200		114		PASARELL L	74
MULROONEY S B	165	NAVA M	68	NORD C E	279		17			234
MUMMAW N	11	NAVALKAR R G	145	NORDSTROM K	214	OHNISHI R	119		PASCULLE A W	30
MUNDFROM G	173	NAVARRO J M	158	NORLANDER L	123	OHTA M	299			235
	282	NAWAZ M S	272	NORLIN S	235	OIKAWA E	282		PASHA R	111
MUNDY L	68	NEAL J L	255	NORMAN D C	245	OKUNOLA L	199	55	PASKELL S	309
MUNOZ N	110	NEALSON K	203	NORMAN G L	309	OKWUMABUA O	16	113	PASKELI M B	154
MUNRO C	39		251	NORMAN J M	71	OLAFSSON J H	301	1	PASZKO-KOLVA C	107
	245	NEALSON K H	71		208	OLDACH D	68	73		130
MUNSON R S JR	185	NECKERS L M	199	NORMANSELL D	179	OLETTA C	30	196	PATE M S	243
	305	NEEDHAM C	151	NORMARK S	12	OLINGER G	313	62	PATEL A	309
	314	NEELY A N	286		27	OLIVARES A Z	42	273	PATEL G B	80
MUNZINGER J	236	NEESER J	305		97	OLIVEIRA S S	36	121	PATEL J	243
MURAD J L	W19	NEGRON J	306		280	OLIVER D	128	243	PATEL J D	242
MURATA S	244	NEIDERLEHNER B R	194	NORQVIST A	42		163	284	PATEL M	243
MURDOCH L C	162	NEIDERS M E	111	NORRIS S J	69	OLIVER J	21	236	PATEL N	77
MURPHY-CORB M	253	NEIDHARDT F C	157		144		139	61		276
MURPHREE R L	305		166		164		228	38	PATEL R K	29
MURPHY C	128		205	NORTH J	214	OLIVER J B	201	74	PATEL S	121
MURPHY C T	276	NEIDICH G A	110		306	OLIVER J D	287	115	PATEL S K	181
MURPHY D L	107	NEILANDS J B	111	NORTH M J	196	OLIVIER C	242	150	PATEL T	202
MURPHY D T	16	NELES H J	308	NORTHROP S D	245	OLKEN S K	208	108		308
	200	NEILORE R	185	NORTON B	91	OLMSTED S B	247	272	PATEREK J R	316
MURPHY G L	305	NELSON E	176	NORTON W D	25	OLSEN A	12	122	PATEY M	286
MURPHY J	219	NELSON G	316	NOUR EL-DIN A	280	OLSEN R	231	242	PATRICK C C	11
	280	NELSON K	37	NOVAK D	30	OLSEN R H	116	306		247
	219		112	NOVAK J S	153		117	306	PATRON N	283
MURPHY J W	268		W2	NOVAK S M	278		165	258	PATTERSON C	30
MURPHY K	162	NELSON M	153	NOVICK R P	112	OLSEN S G	105	144	PATTERSON E	152
MURPHY R C	162	NELSON M R	276	NOVOTNY J F JR	118	OLSON B	282	122	PATTERSON I	159
MURPHY R J	303	NELSON N	77	NOWAK R	309		28	160	PATTERSON J E	32
MURPHY T	303	NELSON S M	208	NOWICKI B	304		107	90		61
MURPHY T F	306	NEMOTO Y	119	NOWICKI S	97	PALACIOS R	191	121	PALARDY J E	109
MURRAY B	10		234		304		271	40	PALLA E	13
MURRAY B E	247	NEMCIONI L	40	NOWICKI S T	246	OLSON E	205	63	PALLERONI N J	246
	278		160	NOWICKI W	301	OLSON E R	41	240		110
MURRAY L	2	NESHAT S	111	NUMMER B A	78	OLSON J	42	107	PALMER C J	122
MURRAY P	85	NESTER E	42	NUNEZ C	234	OLSON J C	246	282		141
MURRAY P R	39	NEUHARD J	204	NURMI H	309	OLSON K J	199	79	PALMER D T	155
MURTAGH P	66	NEUHAUS F C	214	NUYTS G	79	OLSON L	199	206	PALMER H	162
MURTHY A R	287		293	NYCZ C	302	OLSON L D	286	110	PALMER J C	267
MURTY M V S	33	NEUJAH R	62	NYSTROM T	205	OLSON M	245	314	PALMER K	290
MUSE W B	108	NEUMANN M A	159			OLSON M E	278	57	PALMER L M	W1
MUSHAHWAR I K	86	NEUNINGER C	80			OLSSON-LILJEQUIST B	115	139	PALMER R J JR	W4
MUSHER D M	5	NEUWALD P	265			OLSVIK O	198	194	PALMER S E	159
	30	NEUWALD P D	158				280	29	PALMIERI S	247
MUSIAL C E	234	NEVAREZ Y	130			OMANA M	152	110	PALOMARES J C	300
MUSSER J M	84	NEVINS J R	18	O'BRIEN A D	112	OMIECINSKI C	202	276	PALOUCZEK J	299
	112	NEWHOUSE R	300		113	OMONOGBEHIN J A	281	301	PALSDOTTIR R	285
	245	NEWMAN A	30	O'BRIEN T P	160	ONDERDONK A	118	282	PALUMBO A	62





RINALDI M	170	RODRIGUEZ J	150	ROY M M	116	SAKAMOTO T	35	SAYAHMARI ALTAIE	276	SCHRYVERS A B	111
RINALDI M G	74	ROEHRIG J	58	ROY P H	5	SALANITRO J P	116	S		SCHUBINER M	206
	171	ROEMER S	164		28	SALAS AUVERT R	77	SAYAVEDRA SOTO L	204	SCHUBEN R	39
	234	ROESKEN R	249	ROYCHOUDHURY S	166	SALATA R	39	A		SCHUETZE P	208
RINALDI M R	74	ROESSLER P	25	ROZDILSKY W	104	SALEM M	112	SAYLER G	153	SCHULENBERG S	311
RINGELBERG D	248	ROGERS A	76	RUAN M	305	SALEM A G	275	SAYLER G S	63	SCHULTZE LAM S	250
RINGELBERG D B	100	ROGERS A L	173	RUBENS C	246	SALFINGER M	200		78	SCHUPPLER M	144
	194	ROGERS H	158	RUBENS C E	257		278		194	SCHURIG G G	69
RIOS M	242	ROGERS J A	280	RUBENSTEIN D	110	SALGADO-CASTRO D	131	SAYYAR S	34	SCHURR M J	204
RIOS O	242	ROGERS J E	26	RUBERT M	29	SALICRUP L A	91	SAZ A K	315	SCHWAB D A	206
RIQUX C R	303		163	RUBIN F A	185		153	SCALARONE G	234	SCHWABE L	66
RIQUX S	305		195	RUBIN-GRANDIS J	61	SALTIRO G	104	SCALISE G	74	SCHWALBE R	30
RIPLY M	17	ROGERS M B	237	RUBINO J	315	SALKIN I F	74	SCANDELLA C J	29		237
RIPP S	290	ROGERS P	232		WB	SALMON D	235	SCANDOLA M	272	SCHWARTZ L	244
RISTOW K	30	ROGERS R	285	RUBLE D	281	SALMON V C	150	SCARBOROUGH S O	194	SCHWARTZ R W	244
	66	ROGERS R D	116	RUBY E G	196	SALO R	299	SCARINGI L	245	SCHWARZ S	32
RITZ W	124	ROGERS T J	92		223	SALTER L	242	SCHAAD H	279	SCHWEBKE J R	206
	237		135	RUCH P	39	SALUTA M V	37	SCHABE B	61	SCHWEDLER T E	286
RITZI E M	29		281	RUDBACH J	277	SALVATORE M J	104	SCHACHTER J	122	SCHWEIZER H P	166
RIVARD C J	188	ROGLES K G	234	RUDD K	89	SALVO J J	26	SCHAECHTER M	6	SCHWIEDER C F	124
RIVERA F	107	ROHDE J R	70	RUDE T H	131	SALTER J	244	SCHAEFER D M	80	SCHWIDETZKY U	204
	152	ROHNER P	66	RUDNICK J	61	SALYERS A	302	SCHAEFFER W J	199	SCHWIERSKOTT M	163
RIVERA M	32		75	RUDOLPH E	66	SALYERS A A	294	SCHAFER L W	276	SCHMYS P J Y M J	274
RIVERA M D	163	ROJAS A	158	RUDOLPH K M	62		274	SCHAFFIQ J	201	SCIOFINO C V JR	40
RIVERA T	185	ROJAS J	95	RUDRIK J T	244	SAMONS L	294	SCHAIBLE D	302	SCOTT C	206
RIVERA V	25	ROJO M D	158	RUEHNER S	159		30	SCHAIRS P	30	SCOTT D	39
	311	ROLF R D	110	RUFFIN D	29	SAMPLE A K	206	SCHARBAAL R	208		189
RIVERS D B	188		281	RUFEL R	36	SAMPSON B A	41	SCHARFMAN A	114	SCOTT J	287
RIVERS J	220	ROLL B	25	RUHL S	304	SAMUEL J	69	SCHAUBHAUTS R	60	SCOTT J F	72
ROACH M C	315	ROLLINS D	286	RUJZ J M	235	SAMUEL J E	123	SCHAUER D	70	SCOTT J H	156
ROBACK M	75	ROLLINS D M	162	RULE J	120		112	SCHAEFFER J	287	SCOTT M	5
ROBERSON J	281		286	RULE P	202	SAMYN B	305	SCHENIN L	236	SCOTT M	115
ROBERT A	74	ROLLWAG N F M	121	RULEY J R	204	SANBORN M R	111	SCHELL M A	203	SCOTT T	304
ROBERTO F F	101	ROLSMA A	57	RUOFF K	30	SANCHEZ L	204	SCHELLHORN H B	106	SCOTT CRAIG J S	22
	188	ROLSTON K	236	RUPKEY S	208	SANCHEZ M	280	SCHELLHORN H E	205	SCOTT TAYLOR T	150
ROBERTS B	242		237	RUPNOW J	115	SANCHEZ V	76	SCHENK S	241	SCRIVER S R	124
ROBERTS C	151	ROMAGNOLI M	150	RUPP D	311	SANCHEZ-PESCADOR R	158	SCHENTAG J	W18		236
ROBERTS D	139	ROMAN M	25		315		265	SCHERBA G	57	SEAMAN W T	29
ROBERTS D J	154	ROMANI L	286	RUSEKA I	185	SAND W	174	SCHUEERMAN P	139	SEARS B B	269
ROBERTS F	2	ROMER J	315	RUSH C	35	SANDBERG A L	245	SCHUEVERMAN P R	163	SECHI L A	164
ROBERTS G D	3	ROMERO A	306	RUSHING B G	283		304	SCHUIVEN B C	30	SECHRIST A	91
	16	ROMERO-STEINER S	117	RUSHING J	113	SANDEN G N	62	SCHIFMAN R	W16	SECHRIST M	75
	120	ROMICK T L	308	RUSSELL B	40	SANDERS C A	151	SCHILKE B	156	SEGWICK S G	102
	234	ROMINE M	231	RUSSELL H	247		279	SCHILLER N L	299	SEDLACEK J D	316
ROBERTS J A	40	ROMULO R L C	121	RUSSELL J B	157	SANDERS J D	303	SCHILLING W	242	SEELKE R	281
	287	RONDON M R	27	RUSSELL M L	51	SANDERS J W	235	SCHINDLER J	15	SEFFENS W	117
ROBERTS M	78	ROOK M S	241	RUSSELL P W	314	SANDERS L A	35	SCHIRO D	237	SEIBEL N L	171
	226	ROOP R M II	69	RUSSELL R	176	SANDIN R L	276	SCHIRO D D	285	SEIDLER R J	19
ROBERTS M F	73	ROPE A F	63		207	SANDLIN R C	97	SCHLAUDER G G	86	SEIFERT H S	53
ROBERTS M R	159	ROSA M	75	RUSSELL R R B	69	SANDS T W	196	SCHLECH B	247		97
ROBERTS M	315		158	RUSSELL S	117	SANFILIPPO D	235	SCHLESINGER P H	171	SEIFERT S L	273
ROBERTSON B R	203	ROSACKER L L	100	RUST L	114	SANFORD B A	305	SCHLIEVERT P M	17	SEIFFERT A	153
ROBERTSON E S	157	ROSADO A S	79	RUST S R	308	SANGER J M	287		112	SEIPLE J W	39
ROBERTSON J	276	ROSARIO I	194	RUTHERFORD I	309	SANGER J W	287	SCHLITZER R L	315		301
ROBERTSON J A	199		282	RUTHERFORD L T	203	SANGERMANO L C	282	SCHMAD M B	6	SEKHON A S	234
ROBERTSON R	236	ROSAS-ARCOS J I	280	RUTTER M L	284	SANJUAN J	239	SCHMIDT C	156	SEKULA D J	72
	301	ROSATI E	245	RUTZ J M	197	SANKAR-MISTRY P	194	SCHMIDT E L	290	SELA S	102
ROBILLARD L	300	ROSCHKE T	161	RYALS R	301	SANKARE O	316	SCHMIDT J E	15	SELANDER R	239
ROBINS BROWNE R	481	ROSE D	68	RYAN J A	68	SANSEVERINO J	63	SCHMIDT K A	160	SELANDER R K	37
ROBINSON A	75	ROSE J B	59	RYAN K	235		78	SCHMIDT M A	41		112
	300	ROSE J M	40	RYAN K A	306	SANTOS J I	201	SCHMIDT M A	286	SELBY A L	78
ROBINSON E	200	ROSEFF S	150	RYAN P A	202	SAPITOWICZ R J	244	SCHMIDT S	286	SELDIN L	79
ROBINSON J A	136	ROSENBERG A H	307	RYAN R	212	SARACHIAN B	284	SCHMIDT S K	163	SELVATI NAM S	290
	316	ROSENBERG F	25	RYAN R W	301	SARAVANOS K	206		112	SEMES F	72
ROBINSON M	112	ROSENBERG M	39		309	SARAVOLATZ L	242	SCHMITT M P	41	SEMPER K	302
ROBINSON N J	289	ROSENBERG Y	29	RYAN T	302	SARAZIN J	285	SCHMITT S	123	SEMPRINI L	148
ROBINSON-DUNN B	278	ROSENBLATT J	285	RYON J	265	SARASLANI S	272	SCHMITZ A	42	SENECHAL S	92
ROBLEDO I E	26	ROSENBLATT J E	309	RYPKA E W	W17	SARKAR N	57	SCHMITZ H	150	SENFT K	276
ROBLEDO J A	310	ROSENBUSCH R	99	RYU D Y	153	SARTHOU J L	296	SCHMITZ J L	62	SEO S M	32
ROBLES E	25		227	RYU J	36	SARUBBI F A	102	SCHNEEWIND O	305	SEONG S	123
	107	ROSENTHAL R S	287	RYU S	202	SARWAR J	275	SCHNEIDER A	302	SERBOUSEK D	277
ROBLES M C	196	ROSENZWEIG W D	107	RZEPKOWSKI R A	286	SASAKI A	303	SCHNEIDER B	281	SERRA R	62
ROBLIN R	259	ROSNER J L	27		239	SASAKI A	37	SCHNEIDER D R	103	SERRAS M H	165
ROBSON H G	32	ROSOVIST R	70		290	SASEBI K	305	SCHNEIDER J	117	SERVIS N A	34
ROBSON R L	165	ROSS A E	304		290	SASSEVILLE V	68		275	SESHAN K	120
	204	ROSS B	145	SAAVEDRA S	31	SASTRY K	73	SCHNEIDER K	204		131
	204	ROSS B C	60		77	SATHISH M	118	SCHNEIDER R A	304	SESMU J	123
ROBSON R M	211	ROSS D	154	SACKEY F N A	18	SATHYAMOORTHY V	112	SCHNEIDER S A	159	SETLOW P	213
ROCHA E R	104	ROSS J	311	SADOWSKY M J	239	SATO A	66	SCHOCHEMANN G	29	SETTECASI E	62
ROCHFORD D A	251	ROSS R F	227	SADZIENE A	144	SATO K	162	SCHODEL F	185	SETTERQUIST S	38
ROCK S	208	ROSS S	227	SAEED B	302	SAUBOLLE M	170	SCHOEDER B	272		151
ROCKEY D	122	ROSS S E	227	SADZIANE A	302	SAUBOLLE M A	119	SCHOEFFELD A J	203	SETTESTROM J A	121
ROCKIS M	150	ROSSI A	279	SAGIENE A	302		300	SCHOER K	39	SEVER J	242
ROCOURT J	30	ROSSI F	280	SAGIK B P	251	SAUCEDO R	66	SCHOLTMOF H	157		253
ROCOURT M	37	ROSSI M	234	SAGURTON J	276	SAULNIER P	198	SCHONER B	141	SEVERIN A	32
RODE C	37	ROSSIANN S	245	SAMA A	42	SAULNIER P	202	SCHOOLNIK G K	185	SEWELL G W	248
RODERICK C N	194	ROSSODIVITA M L	282	SAMA K	57	SAUNIER M	198		314	SEWELL T	704
RODEWALD A	245	ROSTECK P R JR	204	SAHAM D	170	SAUNDERS N	299	SCHOONMAKER D	208	SEXSTONE A J	26
RODGERS E B	139	ROTH K	280	SAMH D F	10	SAUNDERS N B	198	SCHOPFER K	241	SEYEDIRASHTI S	152
RODGERS R	300	ROTHMAN S W	226		30	SAUTTER R L	109	SCHOULS L	40	SEYFRIED P L	25
RODRIGO G	200	ROTHMAN-DENES L	149	SAMA K	57		126	SCHRAUT W	287	SEYS R L	29
RODRIGUES C	32	ROTHMEL R K	163	SAHAM D	170	SAUTTER R L	109	SCHRECK S	280	SFERA P R	63
	200	ROTHSCHILD M	162	SAHM D F	10		244	SCHRECKENBERGER P	39	SHAM D	302
RODRIGUES M C	232	ROTHSTEIN D M	32		30	SAUER W	162	C	66	SHADDOCK J	17
RODRIGUEZ E R	242	ROTSCHAFFER J	109	SAID W	162	SAIYER K P	243		310	SHAFFER B T	290
RODRIGUEZ G	139	ROTT M A	236	SAIER M H JR	312	SAWYER T E	304	SCHREINER C A	313	SHAFFER E A	287
	281	ROTTM M	156	SAIKKU P	122		162	SCHROEDER B L	246	SHAFFER M C	109
RODRIGUEZ J R	306	ROUPE D	102	SAIKKUN M	249		244	SCHROEDER J	156	SHAM B	200
RODRIGUEZ LEIVA M	153	ROUSH C	42	SAINT GIRONS I	37		310	SCHRUM L W	205	SHAM D	302
RODRIGUEZ M A	258	ROUSSEL P	114		79		313				
RODRIGUEZ S	107	ROUX L	74		311		313				
RODRIGUEZ S	243	ROWE B	280		198		315				
		ROWE G E	280		278		243				
CHAGOLLAN J J		ROY A M	290		71		304				
RODRIGUEZ-NORIEGA E	243	ROY K	115		249		166				
RODRIGUEZ	239		249		300		300				
QUINONES F											
RODRIGUEZ	107										
ZARAGOZA S	155										

SHAH D B	115	SHRINARPURE S	104	SLEDJESKI D	283	SOLNICK J V	37						
SHAH N N	305	SHUKLA S K	72	SLIFKIN M	W10	SOM T	312	STAHL P W	288				
SHAHABUDDIN M	248	SHUM A C	110	SLIVENSKI L	51	SOMASUNDARAM L	272	STAHLBERG M	292	STOKES R W	234		
SHAHAMA* M	201	SHUMAN H	278	SLIVENSKI L L	11	SOMERS F	202	STALEY J T	26	STOKES W	311		
	130		52	SLOAN A R	51	SOMRUTI G A	241		153	STOKROE C	35		
	275		261	SLOAN L	309	SONENSHINE A L	213		248	STOLER M	234		
SHAHIDI A	310	SIA C	40	SLOAT W B	114	SONENSHINE D E	275	STALL R E	161	STOLZ J F	165		
SHAHIN R D	207	SIAMPUSH A R	78	SLOCK J	294	SONG W	281	STAMM M	206	STONE A	109		
SHAKLEE P	286	SIBLEY C H	55	SLONCZYNSKI D	106	SONGER J	208	STAMM W E	301	STONES V L	205		
SHAND G H	233	SIBOO R	173	SLONCZEWSKI J L	205	SONGSAKPHISARN R	62	STAMS A J M	274	STORCH G	150		
SHANHOLTZER C J	286	SICH J J	263	SLONIM L N	314	SONNABEND T	156	STAN LOTTER M	80				
SHANK D D	109	SIDDIQI S	278	SLOTS J	284	SONNAD S	110	STANDARD P G	38	STOREY D G	41		
SHANMUGAM G	16	SIDDIQI S H	145	SLUCHAK J A	279	SONODA M	280	STANECK J L	85				
SHANMUGAM K T	306	SIEBELING R	115	SMALL F	75	SONSTEBY S K	70	STANFIELD J I	112	STOREY M	310		
SHANMUGASUNDARAM	204	SIEBELING R J	110	SMALL F M	300	SOOD R	75	STANLEY A E	278	STORY B P	77		
S	28	SIEGEL C S	249	SMALL J A C	75	SOPER B W	241	STANLEY L A	286	STORZ G	143		
SHANNON B T	181	SIEHNEL R J	197	SMALL G	117	SORDELLI D O	160	STANTON T B	251	STOTT R F	115		
SHANNON M J R	163	SIERRA M J	197	SMALL P A JR	236		287	STARK A	301				
SHANSON D	75	SIEVERDING L M	244	SMALL P L C	185	SORDILLO E	75	STARBNACH M	114	STOTZKY G	146		
SHAO J	208	SIEVERS A S	301	SMALLEY D	70	SORDILLO E M	278	STARZEL T	235				
SHAPIO C	169	SIGLER L	249	SMALLEY D L	70	SORENSEN K	234	STAUFFER G	312	STOUT J E	61		
SHAPIO D	119	SIGMUND J	104	SMAYEVSKY J	302	SORET J	283	STAUFFER G V	204	STOUT K J	236		
	276	SIGVALDOTTIR E	101		68	SORGER S	310	STEARNS L C	118	STOUT R D	122		
SHAPIRO L	27	SIKKEMA D J	303	SMIDT M P	284	SOUCAILLE P	251	STECK T R	205	STOVER C K	246		
	48	SILKCOX V	145	SMILEY B K	117	SOUFI R A	153	STEELE P J	146	STOVER K	102		
SHARAK GENTHNER B	173	SILKCOX V A	16	SMITH A	199	SOUMAK S S A	243	STEELE MOORE L	31	STRAGIER P	48		
R	48		200	SMITH A L	111	SOUTH S L	114		76	STRALEY S C	70		
SHARMA A	239	SILHAVY T	128	SMITH A W	77	SOUTHAM G	31	STEEN W C	33	STRAMARE D	40		
SHARMA B	112	SILHAYE T J	197	SMITH B	304	SOUTHARD S B	38	STEENBERGEN S	299	STRAND C L	W16		
	284	SILVA E	172	SMITH B J	111	SOUTHERN K	17	STEFFAN R J	163	STRAND S E	248		
SHARMA P K	162	SILVEIRA A P D	160	SMITH C J	300	SOUTHERN P	121	STEFFENS D	164	STRANDBERG G W	71		
SHARMA V	293	SILVER J C	37	SMITH C L	119	SOUTHWICK F S	287	STEFFENS T P	255	STRAP J L	77		
SHARMA V K	77	SILVER L	72	SMITH D	5	SOWERS E G	280	STEFFENSEN W S	139	STRATTON C	66		
SHARON N	287	SILVER R P	299	SMITH D C	237	SOWERS M R	286	STEIERT P S	204	STRATTON M	301		
SHAROVA N	296	SILVER S	27	SMITH D G	164	SPADA B	301	STEIGERWALD V J	73	STRATTON N	31		
SHARP E V	313	SILVERMAN B	144	SMITH E E	107	SPADARO J	201	STEIGERWALT A G	208				
SHARP R	307	SILVERMAN M S	301	SMITH E M	203		242	STEIMAN I	276	STRAUS S D	18		
SHARP S E	44	SILVERMAN P	258	SMITH G	106	SPAETE R R	265	STEIN D	69	STRAUSS D	208		
	119	SILVERSTONE S E	161	SMITH J	121	SPAIN J C	154	STEIN D C	154	STRAUSS J	184		
SHARPE P	204	SIM B K L	185	SMITH J A	208	SPANGGORD R J	154	STEIN M A	207	STRAUSS J H	184		
SHAW B	301	SIMA H	238	SMITH J G	29	SPANGLER B	41		197	STREFF F	311		
SHAW M	258	SIMAR R	248	SMITH J J	38	SPANGLER S K	236	STEINBERG D H	241	STRENNKOSKI L	30		
SHAYEGANI M	69	SIMARD P	42	SMITH J P	121	SPANJAARD L	51	STEINBERG K	37	STRICKMAN D	123		
SHEA J	109	SIMBERKOFF M S	236	SMITH J W	202	SPATAFORA HARRIS	177	STEINER D A	99	STRICKMAN J R	38		
SHEEHAN K	38	SIMECKA J W	227	SMITH K R	258	G		STEINGRIMSSON O	301				
SHEETS M	40	SIMKINS S	199	SMITH L	311	SPATAFORA J W	47	STEINGRUBE V A	16	STROBEL H J	105		
SHEFFIELD J	243	SIMMONS B P	134	SMITH M	W20	SPEAR R	184		301	STROBEL S	128		
SHEIKH W	244	SIMMONS D E	198	SMITH N	285	SPEARS P A	16	STEINHAUSER R	184	STROCKBINE N A	280		
SHEN H	76	SIMMONS L A	72	SMITH N H	122	SPECK S H	140		209	STROLL E S	301		
SHEN J	116	SIMMONS R B	313	SMITH R	107	SPECTER S	121	STELMA G N	242	STROM C M	246		
SHEN L P	265	SIMONS C	206	SMITH R H	162	SPECTOR M P	175	STELMA G N JR	143	STRONG C	285		
SHEN S H	304	SIMON D	97	SMITH R III	175	SPECTOR S A	242	STEMKE D J	35	STRONG GUNDERSON	194		
SHEN Y	39	SIMON E M	37	SMITH R L	175	SPECKENBRINK A B J	287	STEMKE G W	199				
SHEN Z	214	SIMON J K	150	SMITH R P	243	SPEERT D P	11	STEMMET N	287	STROUP D	73		
SHENEP J L	247	SIMON R D	161	SMITH S	302			STEMPER M	109	STROZEWSKI K	201		
SHEPHERD R J	157	SIMONET M	160	SMITH S K	29	SPEIDEL H K	151	STENOS J	123	STRUCK D K	42		
SHEPHERD H	242	SIMONSON J	115	SMITH S L	162	SPEITEL G E JR	309	STEPHENS C	171	STRUGNELL T	122		
SHERIDAN L	274	SIMONSON L	51	SMITH S M	300	SPENCE H A	248	STEPHENS K M	42	STUART G	31		
SHERIDAN P	265	SIMOR A	243	SMITH T	309	SPENCER S	159	STEPHENS M L	26	STUART J	275		
SHERIDAN R J	246	SIMOR A E	124	SMITH T F	37	SPENGLER M	42	STEPHENS R S	122	STUART M K	58		
SHERLIN L	171	SIMPSON D	300	SMULIAN A G	214	SPERANZA F	304	STERN C S	243	STUDER C	278		
SHERMAN D	201	SIMPSON E T	305	SMULAVY M D	214	SPERBER S J	287	STERN N J	94	STUDIER F W	307		
SHERMAN D H	106	SIMPSON L M	257	SNEAD S J	231	SPERL G T	71	STETSER R L	159	STUKUS P E	9		
	214	SIMPSON P G	287	SNELL D J	245	SPERL P L	255	STETZENBACH L D	155	STULL T L	84		
SHERMAN J M	31	SIMS G	195	SNELL H	277		255	STEVENS C	29	STUPART M M	247		
SHERMAN P	280	SIN J	77	SNELLING A M	246	SPERRY J F	280	STEVENS D	110	STUTMAN H R	237		
SHERMAN P M	221	SINCLAIR M G	194	SNELLINGS N J	316	SPICER A D	119	STEVENS D A	281	STYRT B	11		
SHERMAN R	246	SINERIZ F	106	SNIDER D	294	SPIEGEL C	85		92	SU H	122		
	275	SINGER J	160	SNINSKY J	284	SPINOLA S	303	STEVENS J M	131	SU P	308		
SHI L	109	SINGER P D	115	SNINSKY J J	242	SPITZER E D	38	STEVENS M E	277	SU Y A	302		
SHI X	166	SINGER S	305	SNODDY G H	316	SPITZER J A	55	STEVENS T O	300	SUBLETT K L	33		
SHIARIS M	63	SINGH B	37	SNYDER J	310	SPITZER S	38	STEVENS T	162	SUCHMANN D	226		
SHIARIS M P	83	SINGH K V	247	SNYDER J W	92	SPITZNER J G	189	STEVENS MILES S	104	SUEN J S	145		
	251	SINGH N	241	SNYDER M	105	SPITZNAGEL J	218	STEVENSON M	296	SUFAT A E	155		
SHIBATA A	60	SINGH P	161	SNYDER M D R	106	SPITZNAGEL J K	218	STEWART C C	163	SUFITA J M	195		
SHIELDS M	163	SINGH S P	197	SO C M	169	SPOTO V	109		203	SUGAI K	316		
S.HIELDS M S	275	SINGH S R	197	SO M	301	SPRING J	310	STEWART G S A B	146	SUGAR A M	92		
SHIGEL J	271	SINNOTT J	109	SOBECKY P A	310	SPRING L	115	STEWART M H	315	SUGUNA S	28		
SHIH G C	88	SIPES D	236	SOBEL J	310	SPROT G D	24	STEWART V	107	SUH S	290		
SHIH J	199	SIRAGUSA G R	308	SOBEL J D	31	SPRUILL C	80		35	SULAYIK M C	27		
SHIH L M	251	SIREGAR J	31	SOCKETT D C	314	SQUIRES C	35	STEWART G	203	SULLIVAN C	158		
SHIKASHIO T K	243	SIRINEK K	279	SOFOFS J	169	SREENIVASAN P K	241	STEWART G	28	SULLIVAN N	66		
SHILKRET K	145	SISON A	247	SOFOFS J N	159	SRI DHAR P	158	STEWART L	290	SULLIVAN N M	66		
SHIMAKETS L	196	SIU P	278	SOHN S	66	SRIWANTHANA B	42	STEWART M	107	SULLIVAN S	272		
SHIMAKETS L J	196	SIVALINGAM J	243	SOIKE K F	244	ST. CYR COATS K	29	STEWART V	35	SULLIVAN T	202		
SHIMODA K	109	SJOGREN R E	W1	SOKATCH J R	W10	ST. JOHN A C	108	STIBITZ S	108	SULTAN T	237		
SHIMOJI H	165	SKATRUD P L	247	SOKOL P A	109	ST. MARTIN E J	64	STILES M	156	SUMAVILLE L	40		
SHINABARGER D	163	SKEIN R	148	SOKURENKO E	237	ST ANTOINE P	247	STILES M E	249	SUMITA O	119		
	165	SKELLY S	62	SOLAIMAN D K Y	241	ST GERMAIN G	74	STILL J M	284	SUMMANEN P	234		
SHINNICK T	299	SKLADANY G	W3	SOLANAS A M	78	STABEL T J	69	STIM K P	35	SUMMERBELL R C	234		
SHINNICK T M	14	SKLASH M	316	SOLLIDAY J	236	STABENAU J	287	STINSON M F	146	SUMMERS A O	5		
	118	SKULNICK M	77			STACEY G	239	STINSON M W	247	SUMMERS GILL J T	198		
SHINODA S	201	SKURNIK M	76			STACK B	36	STITT D T	243	SUN J	306		
SHINOMIYA H	17	SLATER L N	257			STACK J	75		244	SUN J W	177		
SHIOZAKI M T	151	SLAVIK M F	227			STADER J	258	STIVER H G	172	SUN L	312		
SHIRAI M	35					STAGGS T M	111	STOAKES L	30	SUN S	164		
	162					STAHL D	173	STOBAUGH M	62	SUN S H	191		
SHIROZA T	241					STAHL D A	63	STOCKER B A D	113	SUND M	177		
SHIUAN D	312							STOCKER S	185	SUNDBERG A	235		
SHIVELY J M	174							STOCKLEY R A	244	SUNDELDF B	284		
SHIVPRASAD S	108							STOCKMAN L	106	SUNG C	304		
SHLAES D M	51								120	SUNG J Y	287		
SHOBERG R J	10										313		
	144												
SHOCKLEY R	300												
SHOR A	128												
SHORT J M	27												
SHORTIDGE V D	186												
SMOSEYOV O	274												
SHRINER K	77												



WAIT K	119	WARREN J W	42	WELKOS S L	70	WIDMER A F	245	WINDING A	78	WOSKOW S	311
WAITES K B	276	WARREN M M	181	WELLS C L	181	WIEBE M	315	WINFIELD B A	74	WOZNAK D J	114
WAKEFIELD T	68	WARREN N G	77	WELLS D J	247	WIEBE M R	281	WINGE D R	289	WREN C G	299
	124	WARREN R L	16	WELLS J G	152	WIECZOREK L	33	WINGFIELD D	290	WRIGHT A C	159
WALCH M	66	WARSHAUER D	113	WELLS L	198	WIEDBRAUK D L	300	WINGFIELD J M	106	WRIGHT A C	117
WALDERHAUG M O	68	WARSHAWSKY D	183	WELSH L	29	WIEDERMANN B	300	WINKLER H H	152	WRIGHT E L	291
WALDVOGEL F A	23	WASHBURN L	276	WELSH M	301	WIEGEL J	171	WINKLER M E	123	WRIGHT K	228
WALIA S	313	WASHBURN L R	130	WELTER C J	127	WIENCKE K M	279	WINN T	312	WRIGHT R A	257
WALIA S K	279	WASHBURN R	147	WELTMAN G	201	WIENER J	26	WINRAM S B	251	WRIGHT M S	151
	109	WASHINGTON J A II	199	WELTY G	40	WIENRENGA P J	106	WINSTON V	308	WRIGHT R M	276
	154	WASILAUSKAS B	286	WELTY G S	68	WIGENT R J	163	WINTER A J	246	WRIGHT S D	234
WALKER A N	163	WASSELL R	77	WEN J	284	WIGGS L	203	WINTERS D	246	WRIGHT T	272
WALKER C	131	WASSERFALLEN A	16	WENDLER P	66	WIGHTMAN J D	285	WINTERS S	279	WU C	55
WALKER D H	123	WASSERMAN S	39	WENGER J	275	WIKNER J	81	WINTERS W	110	WU C H	265
WALKER E M	69	WATABLE K	77	WENGER J D	94	WIKSTROM B	203	WISDOM R	287	WU F C	301
	164	WATABLE M	16	WENMAN W M	275	WILBER J	203	WISE D L	64	WU H	25
WALKER E S	273	WATANAKUNAKORN	165	WENZEL R	122	WILBER J C	279	WISE K	278	WU J	159
WALKER G	90	C	296	WENZEL R P	303	WILCKE B	265	WISE K S	227	WU J H D	157
WALKER J J	162	WATCHARAPICHAH P	18	WERNER C	109	WILCOX R	158	WISE R	20	WU M	29
WALKER J R	109	WATERBURY J	279	WESLEY I V	315	WILESMITH J W	206	WISHNOW R	16	WU M J	165
WALKER K	302	WATERBURY J	123	WESSELS M R	194	WILEY E	300	WISNIEWSKI B J	109	WU M S	106
	41	WATERS J R	123	WEST J L	297	WILHELM J	203	WISNIEWSKI H L	41	WU Q	222
WALKER K E	286	WATERS P	74	WEST M E	257	WILHELM M P	298	WISOTZKEY J D	41	WU T C	26
WALKER R I	166	WATERS P	66	WEST S E H	92	WILKINS S B	295	WITEBSKY F G	116	WU W	265
WALL D	90	WATERS V L	36	WEST T P	97	WILKINS T D	309	WITHOLT B	173	WU X	248
WALL J D	117	WATHEN L K	29	WESTBY C	41	WILKINSON D	66	WITTHUHN V C	200	WU Y	122
WALLAART E	248	WATKINS W D	228	WESTFALL K	118	WILKINSON D	151	WOESSNER K J	117	WU HSIEN B	166
WALLACE J J	276	WATSKY D	273	WESTON P A	308	WILKINSON D	112	WOLBER P	156	WU HSIEN B A	251
WALLACE M	279	WATSON D A	5	WESTON P A	37	WILKINSON D	281	WOLD W S M	230	WUBAH D A	219
WALLACE N	276	WATSON H	30	WESTON P A	280	WILKINSON D	247	WOLF S U	140	WUERTZ S	26
WALLACE R J JR	16	WATSON H L	227	WESTON HAFFER K	306	WILKINSON D	290	WOLF WATZ H	77	WUN C K	163
	200	WATSON R	227	WESTRICH G	151	WILLARD K	39	WOLFAARDT G M	42	WUNCH K G	253
	295	WATT M A	227	WETHINGTON R	159	WILLARD K E	185	WOLFE C	70	WUNDERL P	115
WALLACE W H	153	WATT S	62	WETTER A	206	WILLET N	284	WOLFE L	250	WURD D E	78
WALLERSTEIN R	282	WATTENDORF D J	164	WETTER A	27	WILLET N P	217	WOLFE M L	37	WURD L P	299
WALLIS C K	150	WATTS S K	197	WETTERAU L	242	WILEY B	189	WOLFE R L	242	WYRICK D H	17
WALLIS R S	145	WATTS H D	181	WEXLER D L	277	WILLEY B M	189	WOLFE R L	70	WYRICK P B	284
WALMSLEY S	222	WATTS J L	107	WEXLER H	285	WILLIAMS A	124	WOLFE R L	7		121
WALSH B	245	WATTS S	162	WEY MOUTH L A	309	WILLIAMS A C	237	WOLFE S	107		53
WALSH J B	262	WATTS S	284	WHEAT L J	108	WILLIAMS A L	73	WOLFF E D	73		122
WALSH M	63	WATZYNIAK B J	80	WHEELER L	31	WILLIAMS C H JR	165	WOLFF M	165		W18
WALSH S R A	162	WAX R	80	WHEELER R C	124	WILLIAMS D	79	WOLFF R A	108	XIA Z	110
WALSH T	37	WAY J	112	WHISENANT J	126	WILLIAMS I	108	WOLFINGER E D	31	XIANGPING Z	200
WALSH T J	219	WAY L	268	WHITBY J L	305	WILLIAMS J M	115	WOLFRAM J H	108	XING R	73
	92	WAYCOTT S	200	WHITCOMB P	44	WILLIAMS E	104	WOLFRAM T L	162	XU G	118
	120	WEAR J E	234	WHITCOMB R F	150	WILLIAMS G	102	WOLOJ M	278	XU J	12
WALTER C	301	WEAVER C	100	WHITE B	248	WILLIAMS H N	278	WOLOSHUK C P	279	XU X	81
WALTER K	232	WEAVER K E	38	WHITE B A	27	WILLIAMS J	122	WOMMACK K E	106	XU Y	273
WALTER M V	19	WEAVER R	199	WHITE C E	316	WILLIAMS J	276	WONG A C L	203		42
WALTERS F	208	WEAVER R E	275	WHITE D	272	WILLIAMS J	243	WONG A L	115		117
WALTON J D	22	WEBB L	208	WHITE D C	139	WILLIAMS L	310	WONG B Y Y	202		
WALTON M A	236	WEBB O	313	WHITE D G	153	WILLIAMS L	194	WONG C K W	284		
WALZER P D	92	WEBB O F	282	WHITE D J	194	WILLIAMS L R	203	WONG D Y	77	YABANNAVAR A	272
WANDA P E	29	WEBER A T	196	WHITE D L	272	WILLIAMS M D	304	WONG E	62	YACOB R	70
WANDA S Y	177	WEBER F H	121	WHITE M R	139	WILLIAMS P	42	WONG H	31	YADAV J S	116
WANG B	290	WEBER J M	141	WHITE R	248	WILLIAMS P P	37	WONG J	290	YAHYA M T	25
WANG C	79	WEBER P C	301	WHITE S	194	WILLIAMS R	162	WONG K K	220	YAJKO D M	119
WANG G	241	WEBSTER K	104	WHITE S	248	WILLIAMS R P	69	WONG L S	306	YAKRUS M	151
	273	WEBSTER R E	76	WHITE T	194	WILLIAMS S	251	WONG M T	164	YAM P	243
WANG H	78	WECKSLER W	197	WHITE T	238	WILLIAMS S B	111	WONG P	95	YAKRUS M	145
	122	WEERATNA R	296	WHITE T J	248	WILLIAMS T	251	WONG P K Y	208	YAMA J T	150
WANG H Y	196	WEI C I	17	WHITE T J	130	WILLIAMS V	35	WONG R	71	YAMADA J T	29
WANG J R	246	WEI S	249	WHITE T J	79	WILLIAMSON J S	242	WONG S	57	YAMATO Y	40
WANG L	306	WEIMBER B C	258	WHITE T J	104	WILLIAMSON M D	300	WONG S	114	YAMAMOTO N	121
WANG P	33	WEINBERG A	197	WHITE T J	236	WILLIAMSON P	34	WONG T Y	166	YAMAMOTO Y	17
	106	WEINER J H	305	WHITE T J	275	WILLIAMSON S	214	WONG Y S	275	YAMANE N	244
	205	WEINER R M	75	WHITE T J	138	WILLIAMSON S	286	WONG W Y	251	YAMASAKI T	28
WANG R	68	WEINSTEIN D L	77	WHITE T J	214	WILLIAMSON S	313	WONGSAWANG S	274	YAN W	32
	199	WEINSTEIN R A	284	WHITE T J	271	WILLIAMSON S	104	WONGSAWANG S	72	YANCEY A	227
	202	WEINSTOCK G	89	WHITE T J	131	WILLIAMSON S	117	WONGSAWANG S	40	YANCEY M	247
	227	WEINSTOCK G M	28	WHITEHEAD T R	274	WILLIAMSON S	180	WONGSAWANG S	198	YANCEY R J JR	171
WANG R F	305	WEINSTEIN R A	52	WHITEHOUSE F JR	91	WILLIAMSON S	66	WOO G J	165		284
WANG R Y	68	WEINSTEIN R A	112	WHITELEY G	300	WILLIAMSON S	205	WOOD S	123		286
WANG S J	115	WEINSTEIN R A	157	WHITELEY H R	283	WILLIAMSON S	285	WOOD B E	232	YANEZ A	227
WANG S P	35	WEINSTEIN R A	204	WHITELEY H R	315	WILLIAMSON S	159	WOOD D O	123	YANG B	308
WANG T	296	WEINSTEIN R A	247	WHITELEY L J B	207	WILLIAMSON S	111	WOOD J M	161	YANG C	156
WANG T W	153	WEINSTEIN R A	284	WHITEFIELD C	299	WILLIAMSON S	80	WOOD K	157	YANG C S	220
WANG W K	106	WEINSTEIN R A	304	WHITMAN W B	73	WILLIAMSON S	25	WOOD M M	301	YANG D M	159
WANG X	247	WEINSTEIN R A	113	WHITT D D	294	WILLIAMSON S	39	WOOD M S	156	YANG D M	272
WANG X P	117	WEINSTEIN R A	303	WHITTAKER C J	177	WILLIAMSON S	106	WOOD N B	159	YANG J C	118
WANG Y	17	WEINSTEIN R A	41	WHITTAM T S	70	WILLIAMSON S	157	WOODALL L D	314	YANG Y	63
	280	WEINSTEIN R A	96	WHITTIER P S	311	WILLIAMSON S	105	WOODARD A	199		197
WANG Y Z	117	WEINSTEIN R A	202	WHITTLE D J	151	WILLIAMSON S	207	WOODGYER A	74	YANO M	281
WANG Z	154	WEINSTEIN R A	190	WHITTON J L	276	WILLIAMSON S	62	WOODING M	201	YANOURI A	158
	201	WEINSTEIN R A	115	WHITTON J L	42	WILLIAMSON S	199	WOODLEY C L	16	YAOQIN Y	200
WANGER A R	242	WEINSTEIN R A	146	WHITTON HUDSON J	224	WILLIAMSON S	120	WOODLEY F W	200	YASIN M	165
	275	WEINSTEIN R A	202	WHITWORTH L C	160	WILLIAMSON S	245	WOODRUFF W A	114	YASKOWIAK E S	157
WANKE C A	296	WEINSTEIN R A	66	WHYBURN D R	305	WILLIAMSON S	315	WOODS D	40	YATES M V	136
WANKE D A	70	WEINSTEIN R A	238	WIATR C L	66	WILLIAMSON S	154	WOODS D E	304	YAU J	150
WANNER B L	197	WEINSTEIN R A	40	WICHER K	238	WILLIAMSON S	39	WOODS G	31	YAZAWA K	234
WARD B B	203	WEINSTEIN R A	51	WICKES B L	40	WILLIAMSON S	151	WOODS J P	234	YE S	312
WARD C H	148	WEINSTEIN R A	125	WICKHAM G S	51	WILLIAMSON S	285	WOODS T	38	YEAMAN M R	245
WARD D C	58	WEINSTEIN R A	66	WICKLOW D T	120	WILLIAMSON S	66	WOODS T	296	YEE A J	280
WARD J	182	WEINSTEIN R A	310	WICKNER R	73	WILLIAMSON S	151	WOODS T	122	YEE Y C	217
WARD J R	287	WEINSTEIN R A	291	WIDEN R	280	WILLIAMSON S	26	WOOLLEN M E	315	YEH H	18
WARD L R	280	WEINSTEIN R A	280	WIDJOKUSUMO A	291	WILLIAMSON S	312	WOOLVEN R	30	YEH W	165
WARD T E	188	WEINSTEIN R A	291	WIDMAN P G	96	WILLIAMSON S	70	WOOTEN J	111	YEHLE C	301
WARIKOO V	15	WEINSTEIN R A	166	WIDMAN P K	17	WILLIAMSON S	39	WORKMAN D	148	YEHLE C O	257
WARING A L	69	WEINSTEIN R A	79	WIDMANN P G	51	WILLIAMSON S	105	WORBO R	249	YEIVIN A	306
WARNER G L	26	WEINSTEIN R A	196	WIDMANN P G	254	WILLIAMSON S	261	WORSHAM P L	286	YELTON D B	51
WARNES C E	272	WEINSTEIN R A	70	WELKOS S	254	WINANS S C	161	WORTHAM W	30	YEN J T	311
WARREN A	316	WEINSTEIN R A	70								
WARREN B	245	WEINSTEIN R A									

YEN-LIEBERMAN B	265		254	ZABRISKIE J B	112	ZEMEL H	64	ZHAO W	11	ZLOTNICK G	160
YEN-LIEBERMANN B	W12	YOUNG M	25		121	ZEPEDA LOPEZ H M	305		57	ZLOTNIK H	30
YERSIN M N	30		217	ZAFARALLA G	237	ZEREN G	197	ZHAO Y	158		208
YEUNG M K	177	YOUNG P	159	ZAHNER H	153	ZERVOS M J	10	ZHENG L	72	ZMIJEWSKI M J JR	64
VI Y	17	YOUNG R F	42	ZAIDI B	154		32	ZHENG M	130	ZOBBIST G	40
YIM H H	166	YOUNG T	227	ZAIDI T S	152		76	ZHENG X	227	ZOLLINGER W D	198
YIU S C K	29	YOUNG V	284	ZAM S G	33		109	ZHENG Z	121		299
YOCUM D M	124	YOUNT N Y	287		272	ZHANEL G G	217	ZHONG G	17	ZONG G	28
YOCUM M	66	YOURASSOWSKY E	310	ZAMANIYAN F	62		304	ZHONG J Z	275	ZOUBERIS	32
	206	YOUSIF A	279		110	ZHANG D	306	ZHONG W	198	KOLIOMICHALIS M	
	285	YOUSTEN A	118	ZAMMIT C	201	ZHANG O	307	ZHOU M	18	ZREIN M	300
YODER O C	131	YU F P	238	ZANCOPE-OLIVEIRA R	277	ZHANG M C	241	ZHOU X	25	ZSIGRAY R	251
YOKOYAMA M T	308	YU G	296	M		ZHANG J	38	ZHU P	241	ZUBAY G	307
YOMANO L P	204	YU H	27	ZANDOTTI C	284		171	ZHU Y	111	ZUBRZYCKI L	206
YOO K	62		312	ZARITSKY A	72	ZHANG J L	265	ZHUANG W Y	27	ZUCCARELLI A J	245
YORK M	125		313	ZARTARIAN M	119	ZHANG L	198	ZIEGELMAIER R	300	ZUCCON F M	164
YORK M K	200	YU J P	73	ZASLOW A	163		113		309	ZUERCKERT W R	144
YOTHER J	247	YU L S L	202	ZAUMETZER I	29	ZHANG Q	257	ZIEGLER H K	185	ZUERNER B L	258
	299	YU N	197	ZAWACKI B	235	ZHANG X	227	ZIELINSKI N A	312	ZUMUA C	227
YOU I S	79	YU V L	61	ZEALEY G	70		18	ZIEMBA V A	245	ZURNER J J	78
YOUNG C	34		208	ZECKNER D	171	ZHANG X Y	163	ZIERDT C H	310	ZUPANCIC T J	79
YOUNG G O	287	YUAN G Q	275	ZEE Y C	251	ZHANG Y	251	ZIERDT W S	202	ZWILLING B S	218
YOUNG H K	5	YUNGBLUTH M	39	ZEHR J P	267		18	ZILINSKAS B A	245	ZYLSTRA G J	117
YOUNG J	239			ZEIDNER D	139	ZHANG Z Q	116	ZIMMERLI W	277	ZYWNQ S R	115
	256			ZEIKUS J G	165	ZHAO J	200	ZIMMERMAN C R	151		286
YOUNG J C	162				248		106	ZIMMERMAN S	51		
YOUNG K	72			ZELDIS J	302		51	ZINGG B C	144		
YOUNG K K Y	200			ZELIGS B J	28		158	ZINK D	104		
YOUNG L Y	163	Z			160		272	ZIOLA B	277		
	195	ZABLOTNEY S	189		315						
			263								

# Summary of Scientific Sessions

ASM General Meeting, 26-30 May 1992  
New Orleans, La.  
Tuesday evening, 8:00 P.M.: Opening Session,  
Ballroom I, New Orleans Convention Center

		WEDNESDAY				THURSDAY			
Room	8:30 A.M.	1:30 P.M.	4:45 P.M.	8:00 P.M.	8:30 A.M.	1:30 P.M.	4:45 P.M.	8:00 P.M.	
Ballroom IA	2. <b>Seminar:</b> Critical Assessment of Current Status and Future Projections of Molecular Diagnostic Methods (C)	44. <b>Seminar:</b> Cost-Effective, Clinically Relevant Microbiology for the 1990s (C)	82. <b>President's Address</b>		84. <b>Seminar:</b> New Approaches to Molecular Epidemiology (C)				
Ballroom IB		45. <b>Seminar:</b> Emerging Pathogens in the Immunocompromised Host (C)			85. <b>Round Table:</b> Practical Problems in Clinical Microbiology (Div. C Lecture) (Senenwirth Memorial Lecture)	125. <b>Round Table:</b> Case Presentations in Clinical Microbiology (C)	167. <b>Eli Lilly Award Address</b>		
Room 20	3. <b>Symposium:</b> Advances in Laboratory Diagnosis of Systemic Fungal Infections (Group V)			83. <b>A Stampede of Zebras: a Staged Reading of a Play about Scientific Misconduct</b>		126. <b>Seminar:</b> Alternative Approaches for Determining MICs (C)		168. <b>President's Forum:</b> "Biological Warfare: an Old Problem and Future Concerns," and President's Reception, Sheraton New Orleans	
Room 10		46. <b>Seminar:</b> Strategy of Isolation and Detection of HIV To Achieve Accurate Diagnosis (V)			86. <b>Seminar:</b> Hepatitis Viruses from A to F (V)	127. <b>Symposium:</b> Cystic Fibrosis (Group I)			
Room 43					87. <b>Seminar:</b> DNA Recombination: Biology and Biochemistry (M)				
Room 90	4. <b>Seminar:</b> Cholera (AAM)								
Room 37	5. <b>Conjugative Transposons and Integrons (Div. H Lecture)</b>	47. <b>Seminar:</b> Molecular Evolution and Systematics of Fungi (R)			88. <b>Seminar:</b> Experimental Studies in Population Genetics and Evolution (R)	128. <b>Seminar:</b> Protein Export in <i>E. coli</i> (M)			
Room 39	6. <b>Seminar:</b> <i>E. coli</i> and <i>S. typhimurium</i> Cell Biology (H)	48. <b>Symposium:</b> Microbial Development (Group II)			89. <b>Seminar:</b> Analysis of Prokaryotic Genomes (M)	129. <b>Seminar:</b> Physiological Studies of Living Bacterial Biofilms (J, K)			
Room 41	7. <b>Seminar:</b> Biochemistry of Methanogenesis from Methyl-Containing Substrates (K)				90. <b>Seminar:</b> Diazotrophic Symbiosis (Div. K Lecture)	130. <b>Microbes in the Environment (Div. I Lecture)</b>			

WEDNESDAY			THURSDAY					
Room	8:30 A.M.	1:30 P.M.	4:45 P.M.	8:00 P.M.	8:30 A.M.	1:30 P.M.	4:45 P.M.	8:00 P.M.
Room 100		49. <b>Seminar:</b> Molecular Biology in the Diagnosis and Epidemiology of Tuberculosis (U)						
Room 26	8. <b>Seminar:</b> Diagnostic Aspects of Carboxymethyl Bacteria (C)					131. Pathogenesis of Fungal Infections (Div. F Lecture)		
Room 103	9. <b>Seminar:</b> What Should the Microbiology Lab Accomplish? (BET)	43. (Noon) <b>Seminar:</b> Update '92 I (BET)			91. Microbiology Education: Elementary School through College (BET) (Education Lecture)	132. <b>Round Table:</b> Unsolved Problems in Teaching Microbiology (BET)		
Room 13	10. <b>Seminar:</b> Enterococci: Increasing Antibiotic Resistance and Prevalence as Nosocomial Pathogens (L)	50. (1:30) <b>Round Table:</b> Critical Thinking or Problem Solving Skills (BET)				133. <b>Seminar:</b> New Therapeutic Advances in Infectious Diseases and Malignancy (Div. V Lecture)		
Room 2	11. Bactericidal Activities of Phagocytes (D)	51. Molecular Biology of Treponemes and Other Spirochetes (D)				134. <b>Seminar:</b> Quantitative Cultures in Hospital-Acquired Infections (L, C)		
Room 5	12. Genetic Regulation of the Synthesis of Fimbriae (B)	52. <b>Seminar:</b> Molecular Biology of Bacterial Respiratory Diseases (B)						
Room 21	13. <b>Seminar:</b> Emerging Opportunistic Fungal Infections (F)	53. <b>Seminar:</b> Model Systems in STD Research (D)			92. Defense against Fungal Infections (F)	135. <b>Seminar:</b> Superantigens and the Immune System (E)		
Room 27	14. <b>Seminar:</b> What Mycobacteriologists Can Learn from Studies on Other Pathogens (U)	54. <b>Seminar:</b> Fungal Enzymes as Markers of Disease Activity (F)			93. <b>Seminar:</b> The Concept of Sterilization (L)	136. <b>Symposium:</b> Applications of Modeling in Microbiology (Group III)		
Room 16		55. <b>Seminar:</b> Endotoxin Effects on Signal Transduction (E)				137. <b>Seminar:</b> Multidrug Resistant Mycobacterium tuberculosis (C)		
Room 85					94. <b>Seminar:</b> What is the Significance of <i>Salmonella</i> , <i>Listeria</i> , and <i>Campylobacter</i> in Foods? (F)	138. <b>Round Table:</b> The Discovery Process (PSAB)		



		WEDNESDAY			THURSDAY		
Room	8:30 A.M.	1:30 P.M.	4:45 P.M.	8:00 P.M.	1:30 P.M.	4:45 P.M.	8:00 P.M.
Room 36	15. Microbial Growth (I)	56. Seminar: Central Physiological Processes Performed by Phototrophic Bacteria (I)			95. Chemotaxis and Motility (I)		
Room 93	16. New Methods for the Diagnosis of Mycobacterial Infections (U)	57. RNA Viruses II (Div. I Lecture)			96. Seminar: Discovery and Applications of Viral RNA Packaging Signals (Y, S)		
Room 1	17. Immune Responses to Microbes (E)	58. Mechanisms of Protective Immunity (E)			97. Pathogenic <i>Nisseria</i> (B)		
Room 80	18. Viral Gene Expression (Div. S Lecture)	59. Seminar: Aspects of Drinking Water Microbial Ecology (N)			98. Seminar: Immunopathogenesis of <i>M. avium</i> Complex Disease (U)		
Room 19	19. Seminar: Assessing the Use of Nonindigenous Microorganisms in Bioremediation I (Q)	60. Seminar: Assessing the Use of Nonindigenous Microorganisms in Bioremediation II (Q)			99. Seminar: Mycoplasmas in Veterinary Medicine (G)		
Room 33	20. Seminar: Molecular Biology of Mycoplasmas (G)	61. Problematic Nosocomial Infections (Div. I Lecture)			100. Microbial Ecology: Groundwater and Subsurface (Div. N Lecture)		
Room 95		62. Round Table: Microbiology: Food and Water Quality Concerns in Developing Countries (PSAB, AAM)			101. Round Table: Molecular Biology and Biochemistry of Acidophilic Chemolithotrophs (PSAB)		
Room 97	21. Seminar: Recent Advances in the Recovery of Food-Borne Pathogens (P)	63. Molecular Probes in Microbial Ecology (Div. Q Lecture)			102. Mycobacterial Genes and Gene Products and Their Roles in Pathogenesis (U)		
Room 82	22. Seminar: Advances in Molecular Genetics of Secondary Metabolism (O)	64. Seminar: Industrial-Scale Microbial and Enzymatic Production of Specialty Chemicals (O)			103. Round Table: Microbial Culture Products for Environmental Applications: Snake Oil or Science? (Q)		
					139. Starvation, Survival, and Recovery of Microorganisms (Q)		
					140. Seminar: DNA Viruses and the Immune System (S)		
					141. Seminar: Pelvic Inflammatory Disease (Div. D Lecture)		
					142. Seminar: Novel Molecular Genetic Approaches for the Production of New Metabolites in Streptomyces (Div. O Lecture)		
					143. Seminar: Against the Odds: <i>Salmonella</i> Survival Strategies (B)		
					144. Lyme Borelliosis (B)		
					145. Mycobacterial Infections and AIDS (U)		
					146. Advances in Detection of Pathogenic Bacteria in Foods (Div. P Lecture)		
					147. Seminar: Immunoprophylaxis of Mycoplasmal Diseases (G)		

		WEDNESDAY			THURSDAY			
Room	P. 30 A.M.	1:30 P.M.	4:45 P.M.	8:00 P.M.	8:30 A.M.	1:30 P.M.	4:45 P.M.	8:00 P.M.
Room 87	23. Seminar: Microbiologically Influenced Corrosion (N)	65. Round Table: How Much <i>Listeria monocytogenes</i> Is Too Much? (P)			104. Natural Product Discovery (O)	148. Seminar: Recent Progress in In Situ Bioremediation (Q)		
Room 38	24. Seminar: Structure and Function of Bacterial "Compartments" (J)				105. Bacterial Transport: ATPase, PTS, Permeases (K)	149. Seminar: RNA Polymerase Promoter Interactions (M)		

		FRIDAY				SATURDAY			
Room	8:30 A.M.	1:30 P.M.	4:45 P.M.	8:00 P.M.	8:30 A.M.	1:30 P.M.	4:45 P.M.	8:00 P.M.	
Ballroom 1A	169 Seminar: Protecting Workers from Infectious Agents (L. SHEA)	211 Seminar: Blood Culture Practices (C)			253 Seminar: AIDS, Infections and Diagnostic Microbiology (V)				
Ballroom 1B	170 Seminar: Pitfalls in Antimicrobial Susceptibility Testing (C)								
Room 20		190 Round Table: Regulatory and Legislative Perspective for Clinical Microbiologists. STATENET (PSAB, AAM)							
Room 10	171 Mycoses: Epidemiology, Host Response, and Treatment (F)	212 Seminar: Rapid Diagnosis: New Pathogens and Old (V, C)			254 (Room 10) Bioreduction of Metals (Q)	289 (Room 10) Seminar: Microbial Metal-Binding Peptides (Q, K, H)			
Room 43	172 Seminar: Iron Regulation: Iron and Sulfur Activator RNA Polymerase Contacts (H)				255 (Room 12) Biodegradation and Bioremediation (N)	290 (Room 12) Gene Transfer in the Environment (Q)			
Room 44					256 (Room 14) Round Table: Cross-Infection Risks in Dentistry (AAM)				
Room 37	173 Systematics and Molecular Diversity of Prokaryotes (Div. R Lecture)	213 Seminar: Novel Regulatory Mechanisms in <i>Bacillus subtilis</i> (H)			257 Polysaccharides and Lipopolysaccharides of Bacterial Pathogens (B)	291 Seminar: Extracellular Destiny of Gram Negative Polypeptides (M)			
Room 39					258 Morphology and Cell Surfaces II (J)				
Room 41	174 Seminar: Iron and Sulfur Chemolithotrophy (K, I)	214 Fatty Acid and Phospholipid Metabolism (K)			259 Seminar: Reproducible Biological Materials (R)				
					260 Seminar: Surviving Hard Times: Growing Interest in Non-growing Cells (M)	292 Seminar: Carcinogen Mutations and Specific Response to Stress? (I)			
					261 Seminar: Molecular Biology and Biochemistry of Bacterial Carbohydrate Transporters (K)	293 Regulation of Biosynthetic Pathways (K)			

FRIDAY SATURDAY

Room	8:30 A.M.	1:30 P.M.	4:45 P.M.	8:00 P.M.	8:30 A.M.	1:30 P.M.	4:45 P.M.	8:00 P.M.
Room 42								
Room 100	209. (11:00) Round Table: Scarlet Fever, Septic Scarlet Fever, Toxic Fever, and Streptococcal Toxic Shock Syndrome (Center for History of Microbiology)							
Room 26	175. Round Table: Update on the Implementation of CLIA '88 (C)	252. (3:30) J. Roger Porter Award Address			262. Round Table: Agarose Gel Electrophoresis of DNA for the Teaching Laboratory (BET)			
Room 103	176. Seminar: Incorporating Virology into the Undergraduate Microbiology Curriculum (BET)	210. (Noon) Seminar: Update '92 II (BET)						
		216. (1:30) Seminar: Discovering Your Role in Precollege Science Education (BET)						
Room 13	177. Oral Colonization and Carogenic Activities of Streptococci and Other Microorganisms (D)	217. Resistance to Quinolones (Div. A Lecture)			263. Seminar: New Directions in Undergraduate Education (BET)	288. (Noon) Seminar: Update '92 II (BET, R)		
						294. (1:30) Innovative Strategies for Teaching Microbiology (BET)		
Room 2	178. Seminar: Cytokines and Infectious Diseases (E, V)	218. Seminar: Antimicrobial Mechanisms and Effector Molecules (Mater Memorial/Div. E Lecture)						
Room 5	179. Round Table: Case Presentations in Clinical and Diagnostic Immunology (V)	219. Seminar: Cytokines in the Mycoses (F)						

FRIDAY				SATURDAY				
Room	8:30 A.M.	1:30 P.M.	4:45 P.M.	8:00 P.M.	8:30 A.M.	1:30 P.M.	4:45 P.M.	8:00 P.M.
Room 21	180. <b>Seminar:</b> Molecular Characterization of Virulence Factors in Pathogenic Fungi (F)	220. <b>Seminar:</b> Indoor Air and Bioaerosols (Q)			204. <b>Seminar:</b> New Developments in Bacterial and Parasite Vaccines (E)	295. $\beta$ -lactam Resistance (A)		
Room 27	181. Bacterial Invasion of Host Cells (Div. B Lecture)		252A. Cetus Corp. Award Address		265. Detection of Viral Nucleic Acids and Antigens (S)	296. Molecular Biology and Immunology of Human Immuno-deficiency Viruses (T)		
Room 16	182. <b>Seminar:</b> Non-quinolone Inhibitors of DNA Gyrase (A)	221. <b>Seminar:</b> Attaching and Efficating Agents of Diarrhea (B, D)			266. <b>Seminar:</b> Acquired Immunity to Mycobacterial Infections (U)	297. <b>Seminar:</b> Pathogenesis of Food-Borne Disease (B)		
Room 85	183. <b>Seminar:</b> Antibody Engineering in Microbes (O)	222. Cell-Mediated Immune Responses in Mycobacterial Infections (Div. U Lecture)						
Room 36		223. <b>Seminar:</b> Sensory/Response Systems for Diverse Environmental Signals (I)			267. <b>Seminar:</b> Nucleic Acids in the Environment (O)			
Room 93	184. <b>Symposium:</b> Cellular Receptors for Animal Viruses (Group IV)	224. <b>Seminar:</b> Molecular Mechanisms of Viral-Induced Disease (S, T)						
Room 1	185. New Developments in Vaccines: Vehicles (E)	225. <b>Seminar:</b> Regulation and Function of Bacterial Cytolytic Toxins (D)			268. <b>Seminar:</b> Scaleup: Interface between Microbiologists and Biochemical Engineers (O)			
Room 80	186. <b>Seminar:</b> Leprosy Research: Present and Future (U)	226. <b>Round Table:</b> Microbiologists and Mentors (PSAB)						
Room 19	187. <b>Seminar:</b> Molecular Biology of Uropathogens (B)	227. Molluscs: Cell Surfaces, Immunology, and Host Interaction (Div. G Lecture)			269. <b>Seminar:</b> Plant and Insect Molluscicides (G)	298. <b>Seminar:</b> Bovine Spongiform Encephalopathy: "Mad Cow Disease" (G, C)		
Room 33	188. Biotransformations and Bioconversions (O)	228. Microorganisms in Shellfish and Shellfish-Raising Waters (Q)			270. <b>Seminar:</b> Advances in Preservation Systems for Foods (P)	299. Capsule Expression by Bacterial Pathogens (D)		
Room 95	189. <b>Round Table:</b> Science Literacy: a Fable for Our Time (BET)	229. <b>Seminar:</b> Using History To Enrich the Teaching of microbiology (BET)						

		FRIDAY				SATURDAY			
Room	8:30 A.M.	1:30 P.M.	4:45 P.M.	8:00 P.M.	8:30 A.M.	1:30 P.M.	4:45 P.M.	8:00 P.M.	
Room 97		230. <b>Seminar:</b> Nucleic Acid Amplification and Other Innovative Detection Systems (P)							
Room 82	191. <b>Seminar:</b> Use of PCR for Environmental Monitoring (Q)	231. <b>Seminar:</b> Molecular Approaches in Subsurface Microbial Ecology (N)							
Room 87	192. <b>Seminar:</b> Detection of Pathogens by Conductance Microbiology (P)	232. Solventogenic Microbes: Natural and Engineered (O)							
Room 38	193. <b>Seminar:</b> Capsid Assembly and Packaging in Bacteriophages (M)	233. <b>Seminar:</b> RNA Bacteriophages Revisited (Div. M Lecture)			271. Interactions of Host and Phage Elements in Gene Expression (M)				

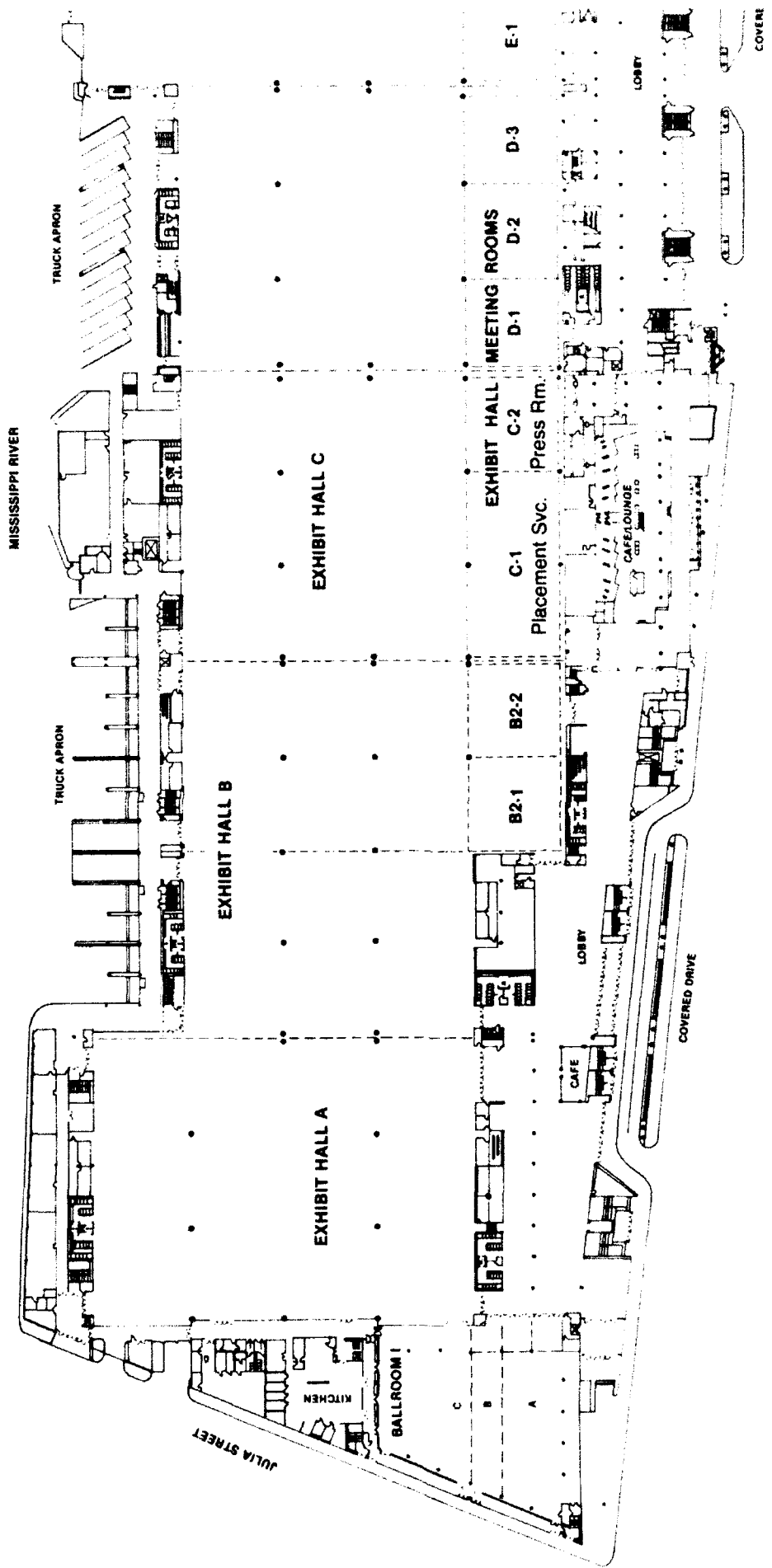
## Poster Sessions

WEDNESDAY, 27 May					THURSDAY, 28 May				
9:00 A.M.	10:30 A.M.	1:30 P.M.	3:00 P.M.	9:00 A.M.	10:30 A.M.	1:30 P.M.	3:00 P.M.		
25. Water Quality (Q)	33. Microbial Interactions with Sulfur Compounds (Q)	66. Bacteremia and Fungemia I (C)	74. Epidemiology of Fungal Infections (F)	106. Gene Cloning and Expression of Fermentation Enzymes (O)	115. Characterization and Detection of Gram-Negative Bacteria in Foods (P)	150. Viral Detection I (C)	159. Viral Detection II (C)		
26. Biotransformation and Degradation (Q)	34. Microbial Ecology: Soil and Water (N)	67. Serodetection of Bacterial, Parasitic, and Miscellaneous Antigens (V)	75. Bacteremia and Fungemia II (C)	107. Microbiological Water Quality (N)	116. Biodegradation of Petroleum and Its Components (Q)	151. Mycobacteria: Cultivation, Identification, and Pathogenic Mechanisms (U)	160. Improved Methods of Protective Immunity (E)		
27. Novel Regulatory Proteins (H)	35. Sigma Factors and Promoters (H)	68. Mollicutes and Disease (G)	76. Susceptibility of Fungi and Other Microorganisms (A)	108. Global Regulation: Carbon, Nitrogen, and Iron (H)	117. Metabolism of Phenolics and Halogenated Organics (K)	152. Protozoan Pathogens (B)	161. Plant-Microbe Interactions (N)		
28. Mutagenesis and Recombination (H)	36. Plasmids: Replication and Conjugation (H)	69. Physiology and Structure of Pathogenic Bacteria (D)	77. Miscellaneous Antimicrobial Activity (A)	109. Epidemiologic Typing: Miscellaneous Nosocomial Infections (L)	118. Microbial Metabolism and Products (I)	153. Applied Microbiology (D)	162. General Environmental Microbiology (Q)		
29. RNA Viruses I (T)	37. Molecular Taxonomy and Evolution (H)	70. Genetics of Virulence of Pathogenic Bacteria (B)	78. Biodegradation of Lignin and Polyaromatic Hydrocarbons (Q)	110. Gastrointestinal Pathogens (C)	119. Fungi: Detection, Identification, and Antimicrobial Susceptibility Testing (C)	154. Nitrate Removal and Biodegradation of Nitroaromatics and Azo-Dyes (Q)	163. Biotransformation and Degradation II (Q)		
30. Bacterial Identification Systems (C)	38. Molecular Biology and Molecular Epidemiology of Fungi (F)	71. Microbial Interactions with Metals (Q)	79. Plasmids: Novel Properties (H)	111. Iron: Transferrin and Hemoglobin Binding, Siderophores, and Outer Membrane Proteins (B)	120. Fungal Biology and Pathogenesis (F)	155. Environmental Virology and Aerobiology (Q)	164. Genome Structure and Analysis (H)		
31. Mechanism of Action and Resistance (A)	39. Specimen Collection, Transport, Processing, and Management (C)	72. DNA Replication and Modification (H)	80. Archaeobacteria II (I)	112. Exotoxins (B)	121. Cytokine and Inflammatory Host Responses to Infections (E)	156. Gene Regulation in Anaerobiosis and in Photosynthesis (H)	165. Enzymes (K)		
32. Antibiotic Resistance (A)	40. Vaccines and Immune Responses (E)	73. Archaeobacteria I (I)	81. Eukaryotic Microbial Metabolism (K)	113. Virulence and Invasion of <i>Salmonella</i> and <i>E. coli</i> (B)	122. Chlamydia: Epidemiology, Physiology, and Immunology (D)	157. Translation (H)	166. Environmental Sensing, Pressure and Hearing (H)		
	41. Exotoxins: <i>Bordetella</i> , <i>Corynebacterium</i> , <i>Pseudomonas</i> (B)			114. <i>Pseudomonas</i> Virulence Factors and Physiology (D)	123. Intracellular Pathogens: <i>Rickettsia</i> , <i>Coxiella</i> , and <i>Ehrlichia</i> (D)	158. Viral Diseases and Diagnostics (S)			
	42. Hemolysin, Urease, Phosphate, Protease, Lipase (B)				124. Susceptibility to Quinolones (A)				

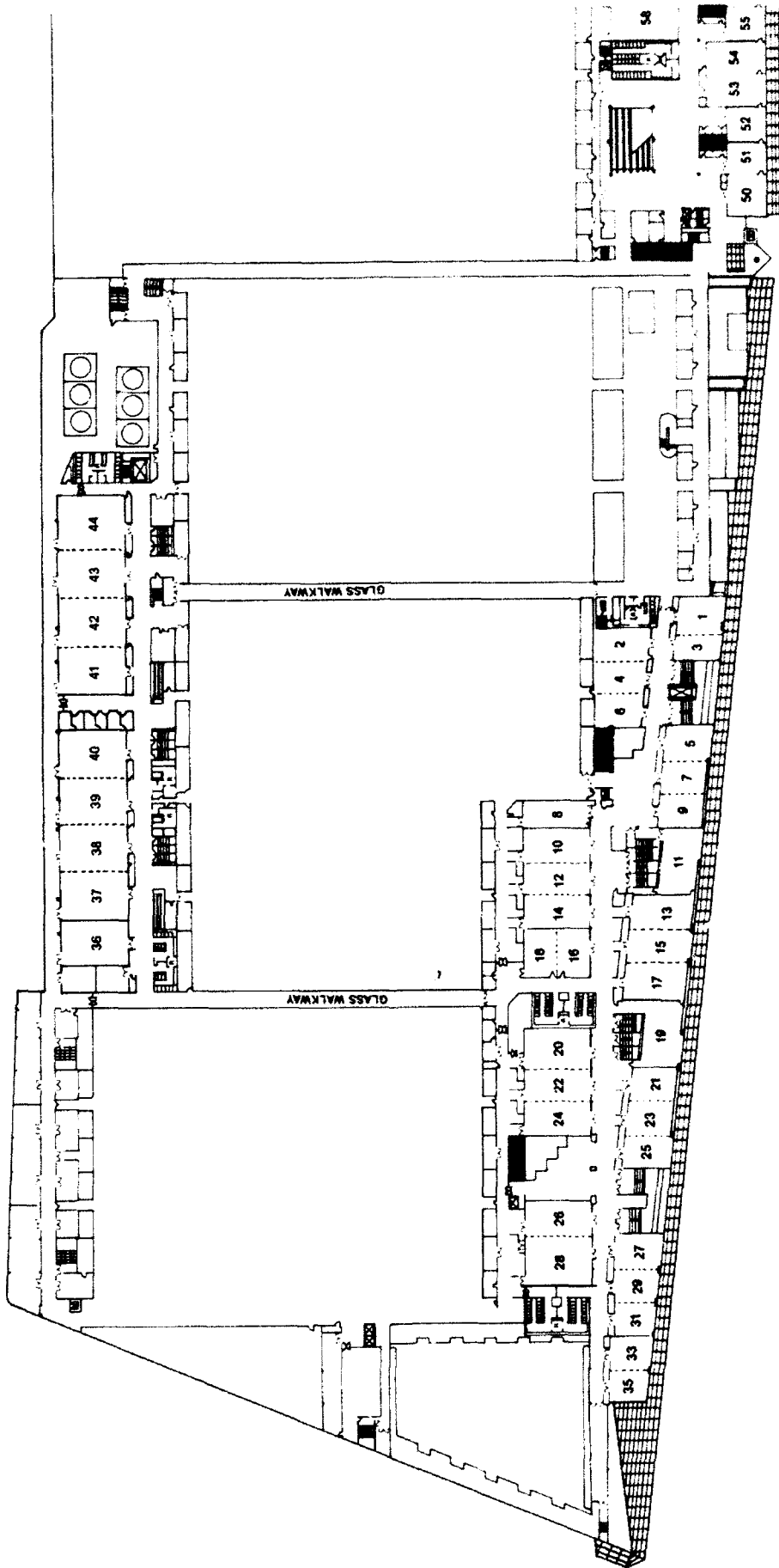
## Poster Sessions

FRIDAY, 29 May				SATURDAY, 30 May			
9:00 A.M.	10:30 A.M.	1:30 P.M.	3:00 P.M.	9:00 A.M.	10:30 A.M.	1:30 P.M.	3:00 P.M.
194. Microbial Detection Methodology (Q)	202. Characterization and Detection of Gram-Positive Bacteria in Foods (P)	234. Clinical Mycology Laboratory and Antifungal Therapy (F)	243. Detection of Emerging Resistance to Antibiotics (C)	272. Biotransformation and Biodegradation IV (Q)	282. Applications of Bioluminescent Reporter Genes and PCR in Environmental Microbiology (Q)	300. Serodiagnosis I (C)	309. Serodiagnosis II (C)
195. Biotransformation and Degradation III (Q)	203. Marine Microbial Ecology (M)	235. Emergence of Resistant Pathogens; Catheter-Related Infections (L)	244. Antimicrobial Susceptibility Test Systems (C)	273. DNA Rearrangements: Transposition and Inversion (H)	283. mRNA: Structure, Turnover, and Antisense (H)	301. Chlamydia (C)	310. Fastidious and Unusual Pathogens (C)
196. Microbial Symbiosis and Development (I)	204. Metabolic Operon Organization (M)	236. Antimicrobial Susceptibility Testing (C)	245. Streptococci and Staphylococci: Virulence Factors and Animal Models of Infection (B)	274. Polymer Degradation and Hydrolytic Enzymes (K)	284. Epidemiology of Bacterial and Viral Agents II (C)	302. Hepatitis Virus, HIV, and Other Viral and Mycoplasma Infections (V)	311. Applied Microbiology (I)
197. Outer and Inner Membranes: Structure and Function (K)	205. Miscellaneous Shock Responses (M)	237. Susceptibility and Resistance to $\beta$ -Lactams (A)	246. Streptococci and Staphylococci: Surface Proteins and Extracellular Components (B)	275. Epidemiology of Bacterial and Viral Agents I (C)	285. Anaerobes (C)	303. <i>Haemophilus</i> and <i>Branhamella</i> spp (B)	312. Gene Expression Protein-DNA Interactions (H)
198. Molecular Techniques for Detection and Characterization of Organisms of Clinical Significance (C)	206. Noncultural Detection of Pathogens and Toxins (C)	238. Biofilms, Biofouling and Corrosion (Q)	247. Streptococci, Enterococci, and Staphylococci (B)	276. <i>Clostridium difficile</i> Toxin Detection (C)	286. Immune Response to Pathogenic Microorganisms: Animal Models of Infection (B)	304. Adherence of Pathogens to Host Cells (B)	313. Bacterial Colonization and Biofilm Formation on Biomaterials (D)
199. Mollicutes: Molecular and Cell Biology (G)	207. Lipopolysaccharides and Lipooligosaccharides of Gram-Negative Pathogens (D)	239. Biology of $N_2$ fixation (N)	248. Biodegradation of Chlorinated Alkanes and Alkenes (Q)	277. Host-Pathogen Interactions in Fungal Infection (F)	287. Host Factors in Infection (B)	305. Bacterial Adherence, Invasion, and Surface Protein Expression (D)	314. <i>Pili</i> and <i>Fimbriae</i> (D)
200. Diagnosis of Mycobacterial Infections (U)	208. Widening Spectrum of Virulence (D)	240. Microbial Systematics and Diversity (R)	249. Control and Detection of Yeast, Fungi, and Bacteria in Foods (P)	278. Mycobacterial Drug Resistance and Susceptibility (U)	288. Eukaryotic Genes: Expression and Functions (H)	306. Eukaryotic Genes: Expression and Functions (H)	315. Sterilization Preservation and Microbial Quality Control (Q)
201. PCR and Other DNA Assays for Detection of Pathogens (D)	209. PCR and Other DNA Assays for Detection of Pathogens (D)	241. Navel Vectors and Overexpression Systems (M)	250. Morphology and Cell Surfaces I (J)	279. Clinical Trials and Efficacy in Animals (A)	289. Enteric Pathogens (D)	307. Control Mechanisms of Phage Replication and Expression (M)	316. Population Diversity and Dynamics (Q)
		242. Detection of Human Retroviruses (T)	251. Genetic and Enzymatic Regulation of Metabolic Pathways (K)	280. Enteric Pathogens (D)	281. Enterotoxins (B)	308. Feed and Food Related Products and Microorganisms (O)	

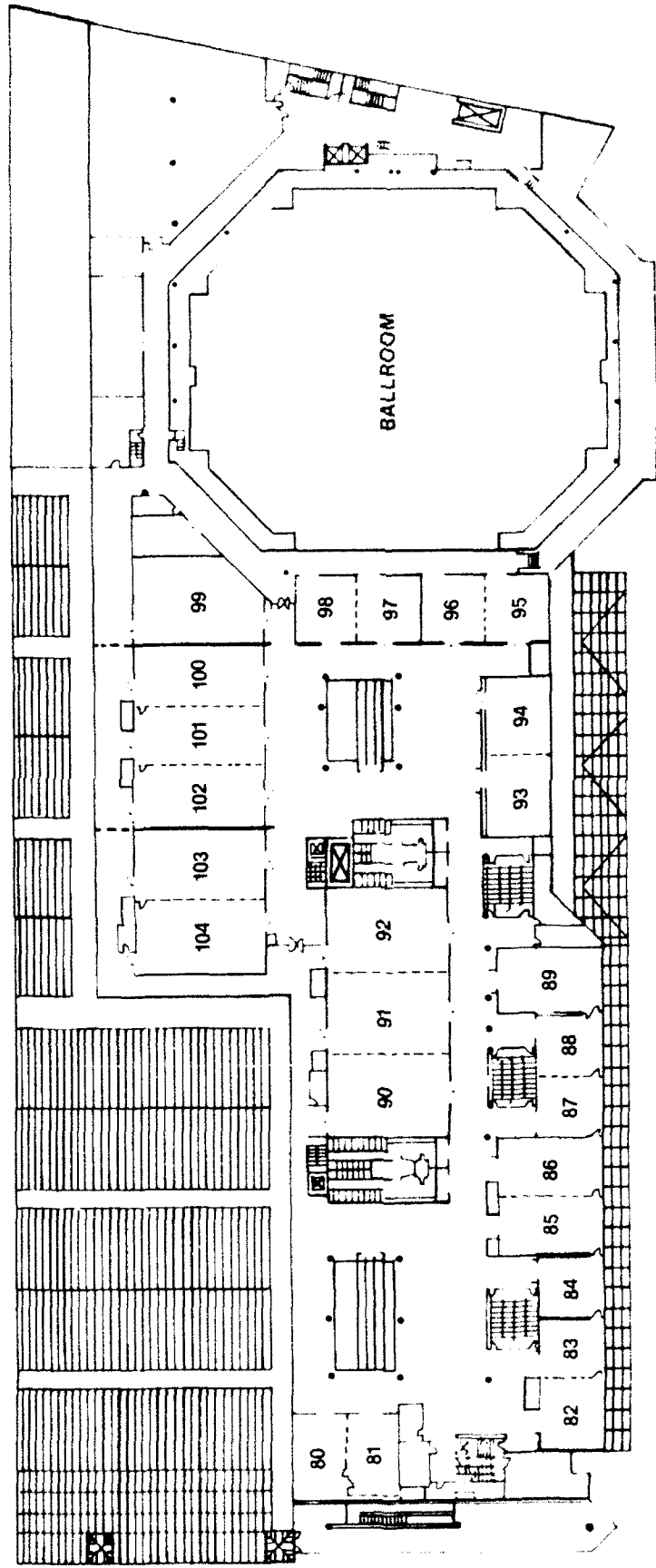




FIRST LEVEL



SECOND LEVEL



THIRD LEVEL

## 1992 GENERAL MEETING OFFICIAL APPOINTMENTS

(Unless otherwise specified, all meeting rooms are located in the Sheraton New Orleans or the Waterbury Conference Center within the Sheraton New Orleans)

### Tuesday, 26 May

*American Board of Medical Microbiology:* 8:00 A.M., Flannery O'Connor Room, Waterbury Conference Center  
*Board of Education and Training:* 11:00 A.M., Tennessee Williams Room, Waterbury Conference Center  
*Board of Governors, American Academy of Microbiology:* 1:00 P.M., Walt Whitman Room, Waterbury Conference Center  
*New Member Orientation:* 4:30 P.M., Rhythms  
*Official Opening Session:* 6:00 P.M., Ballroom I, New Orleans Convention Center  
*Opening Reception:* 8:00 P.M., Aquarium of the Americas

### Wednesday, 27 May

*Publications Board:* 8:00 A.M., Walt Whitman Room, Waterbury Conference Center  
*Public and Scientific Affairs Board:* 8:30 A.M., Tennessee Williams Room, Waterbury Conference Center  
*Branch Officers' Forum:* 9:00 A.M., St. Charles (B) Room  
*Branch Presidents and Secretaries Luncheon:* 11:30 A.M., Aurora Room  
*GMPC and Divisional Officers:* 11:30 A.M., Bayside (A) Room  
*ASM News Editorial Board:* 12:00 P.M., Crescent Room  
*Branch Organization Committee:* 3:00 P.M., St. Charles (A) Room  
*ABMM Diplomates Reception:* 6:00 P.M., Bayside Room

### Thursday, 28 May

*Division Officers' Forum:* 7:00 A.M., Aurora Room  
*IAI Editorial Board:* 7:30 A.M., Pontchartrain Ballroom, Section D  
*AEM Editorial Board:* 7:30 A.M., St. Charles (B) Room  
*General Membership Meeting:* 12:00 P.M., Room 5, New Orleans Convention Center  
*JCM Editors:* 12:00 P.M., Esterwood Room  
*IAI Editors:* 12:00 P.M., Bonnie Burn Room  
*Archives Committee:* 1:30 P.M., St. Charles (A) Room  
*AAM Fellows Reception:* 6:00 P.M., Armstrong Ballroom  
*President's Forum:* 8:00 P.M., Grand Ballroom  
*President's Reception:* 9:00 P.M., Pontchartrain Ballroom

### Friday, 29 May

*JCM Editorial Board:* 7:30 A.M., Rhythms  
*JB Editorial Board:* 7:30 A.M., Bayside (B) Room  
*Membership Committee:* 8:00 A.M., Felicity Room  
*Council Policy Committee:* 8:30 A.M., Walt Whitman Room, Waterbury Conference Center  
*Placement Services Committee:* 11:00 A.M., Gallier House Room  
*AEM Editors:* 12:00 P.M., Bonnie Burn Room

### Saturday, 30 May

*Council Policy Committee:* 8:30 A.M., Walt Whitman Room, Waterbury Conference Center

### Sunday, 31 May

*Council of the Society:* 8:30 A.M., Pontchartrain Ballroom