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Yeast

A Newsletter for Persons Interested in Yeast

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Editorials

Robert K. Mortimer (1927-2007)

Dr. Robert Mortimer, Professor Emeritus at the University of California, Berkeley, died this last August. Many of us knew Bob as a knowledgeable yeast geneticist and a gentle colleague, who in retirement turned to studies of the ecology of yeasts in vineyards. He will be missed by all.

Samuel P. Meyers (1925-2007)

Dr. Sam Meyers, marine mycologist, poet, and mentor to a number of yeast researchers, passed away recently. His former associates include Don Ahearn, Jack Fell, and Sally Meyer, to whom I extend my condolences.

Retirement - Dr. Graham Stewart

Prof. Graham Stewart has recently retired from Heriot-Watt University and will be ending his tenure as Associate Editor of the Yeast Newsletter. I thank him for his cooperation in the distribution of the Yeast Newsletter in the United Kingdom and wish him the best in his retirement.

I wish our readers a happy and scientifically rewarding new year!

M. A. Lachance, Editor

I. Department of Food Science and Technology, Wiegand Hall, Oregon State University, Corvallis, Oregon, USA 97331-6602. Communicated by Alan Bakalinsky <alan.bakalinsky@oregonstate.edu> http://www.cgrb.oregonstate.edu/faculty/bakalinskyBakalinsky.

Recent publications.

1. V Cheng, HU Stotz, K Hippchen and AT Bakalinsky 2007 Genome-wide screen for oxalate-sensitive mutants of *Saccharomyces cerevisiae*. Appl Environ Microbiol 73:5919-5927.

Oxalic acid is an important virulence factor produced by phytopathogenic filamentous fungi. In order to discover yeast genes whose orthologs in the pathogen may confer self-tolerance and whose plant orthologs may protect the host, a *Saccharomyces cerevisiae* deletion library consisting of 4,827 haploid mutants harboring deletions in nonessential genes was screened for growth inhibition and survival in a rich medium containing 30 mM oxalic acid at pH 3. A total of 31 mutants were identified that had significantly lower cell yields in oxalate medium than in an oxalate-free medium. About 35% of these mutants had not previously been detected in published screens for sensitivity to sorbic or citric acid. Mutants impaired in endosomal transport, the *rgp1*, *ric1*, *snf7*, *vps16*, *vps20*, and *vps51* mutants, were significantly overrepresented relative to their frequency among all verified yeast open reading frames. Oxalate exposure to a subset of five mutants, the *drs2*, *vps16*, *vps51*, *ric1*, and *rib4* mutants, was lethal. With the exception of the *rib4* mutant, all of these mutants are impaired in vesicle-mediated transport. Indirect evidence is provided suggesting that the sensitivity of the *rib4* mutant, a riboflavin auxotroph, is due to oxalate-mediated interference with riboflavin uptake by the putative monocarboxylate transporter Mch5.

2. G Winter, R Hazan, AT Bakalinsky, and H Abeliovich 2008 Caffeine induces macroautophagy and confers a cytocidal effect on food spoilage yeast in combination with benzoic acid. Autophagy 4:1-9.

Weak organic acids are an important class of food preservatives that are particularly efficacious towards yeast and fungal spoilage. While acids with small aliphatic chains appear to function by acidification of the cytosol and are required at high concentrations to inhibit growth, more hydrophobic organic acids such as sorbic and benzoic acid have been suggested to function by perturbing membrane dynamics and are growth inhibitory at much lower concentrations. We previously demonstrated that benzoic acid has selective effects on membrane trafficking in *Saccharomyces cerevisiae*. Benzoic acid selectively blocks macroautophagy in *S. cerevisiae* while acetic acid does not, and sorbic acid does so to a lesser extent. Indeed, while both benzoic acid and nitrogen starvation are cytostatic when assayed separately, the combination of these treatments is cytocidal, because macroautophagy is essential for survival during nitrogen starvation. In this report, we demonstrate that *Zygosaccharomyces bailii*, a food spoilage yeast with relatively high resistance to weak acid stress, also exhibits a cytocidal response to the combination of benzoic acid and nitrogen starvation. In addition, we show that nitrogen starvation can be replaced by caffeine supplementation. Caffeine induces a starvation response that includes the induction of macroautophagy, and the combination of caffeine and benzoic acid is cytocidal, as predicted from the nitrogen starvation data.

II. School of Biological Sciences, University of East Anglia, Norwich NR4 7TJ, England, Communicated by J.A. Barnett <j.barnett@uea.ac.uk>.

Current publications.

1. Barnett JA 2007 A history of research on yeasts 10: foundations of yeast genetics. Yeast 24:799-845.
2. Eddy AA & Barnett JA 2007 A history of research on yeasts 11. The study of solute transport: the first 90 years, simple and facilitated diffusion. Yeast, in the press.
3. Barnett JA 2008 A history of research on yeasts 12: medical yeasts.

III. Institute of Fermentation Technology and Microbiology, Technical University of Lodz, 90-924, Lodz, Wolczanska 171/173, Poland. Communicated by Dorota Kregiel <dkregiel@p.lodz.pl>.

Recent conference presentations.

Lecture presented at the International Specialised Symposium on Yeasts – ISSY26, Sorrento (Naples), Italy, 03-07 June 2007.

1. Dziedziczak K, Kregiel D, Ambroziak W 2007 Encapsulated yeast in alginate multichamber beads suitable for brewing.

Immobilization of yeast cells has become popular in industrial processes due to the obvious advantages, e.g. resistance to stress and changes in the environmental conditions. The most important advantage is the possibility of employing such immobilized yeasts in continuous operations which retain high cell densities per unit of bioreactor volume and very high fermentation rates. In this study the strain of industrial bottom fermenting yeast *Saccharomyces cerevisiae* KD1 was used. Encapsulation of yeast cells in alginate beads was based on traditional process of droplet formation from foaming basic solutions followed by solidification. For increasing mechanical stability and preventing cell leakege from alginate beads different outer membranes first from poly-L-lysine and than from alginate or silica were formed. Biotechnological studies of main fermentation processes with the use of immobilized microorganisms were conducted on laboratory scale using the method of immobilized "repitching" yeast. The primary fermentations were conducted in bath cultures in 12 °P in malt wort at temperature 10 °C for free or immobilized yeast strains. The effect of immobilization on yeast physiology and fermentation properties was monitored using microscopic techniques, plate count methods and analysis of carbohydrates (HPLC), alcohol and volatile flavor/aroma compounds (GC) in fermentation medium, whereas trehalose and glycogen in yeast cells were detected by enzymatic assays. Examination of cell loading, cell leakage, ability to growth and form colonies showed that the effectiveness of yeast cells immobilization in multichamber alginate beads was very high. The novel method used for yeast cell entrapment led to the formation of a peculiar microenvironment with activated metabolic responses of yeast. The serial fermentation trials with immobilized repitching cells showed systematical process of yeast adaptation to fermentation conditions. This phenomena appeared in decreasing of trehalose content in yeast cells and in shortening of time of primary fermentation from 10 days to 1 day for the first and the seventh repitching respectively. The entrapped yeast cells showed high ethanol production by and proper profile of green beer flavor. The production of higher alcohols and esters by free and immobilized cells was comparable, but amount of acetaldehyde produced by immobilized yeast was significantly decreased.

This work was supported by KBN Grants: 2P06T 08129 and 2P06T 07629.

Posters presented at the International Specialised Symposium on Yeasts – ISSY26, Sorrento (Naples), Italy, 03- 07 June 2007.

2. Kregiel D & Ambroziak W 2007 Selection of yeast strains suitable for ethanol production from starch sources.

Starch from wheat, maize, potato or cassava is a potential high-yielding ethanol source for fermentation processes. Yeast cocultures contained different amylolytic and fermentative strains offer efficient biotechnological systems of starch degradation into fermentable glucose and than into ethanol. Yeast strains of *Debaryomyces occidentalis* with high amylolytic activity due to extracellular α-amylase and glucoamylase and strains of *Saccharomyces cerevisiae* with superior ethanol fermentation capability may form together such specific bioactive cocultures in starchy media. The main idea of conducted study was selection of yeast strains from the genera of *Debaryomyces* and *Saccharomyces* which have potential to be used in bioethanol production. The mixed yeast cultures of free and/or encapsulated cells in multichamber alginian cores covered with specific protective layer were used for fermentation process. Yeasts biomass synthesis, amylolytic and fermentative activity of tested yeast strains in minimal medium supplemented with glucose or starch were evaluated on the basis of amylases secretion and ethanol production. The process of starch fermentation was analysed in different variants of mono- and mixed populations of yeasts. Additionally, the competition between tested strains, the killer factor and the effect of yeast immobilization were studied. The coculture of *D. occidentalis* and *S. cerevisiae* strains with the best amylolytic and fermentative properties was selected with maximum ethanol fermentation efficiency seen at 50 g/L concentration of starch. Amensalism, depended on killer phenomenon wasn't observed between tested yeasts. The novel immobilization technique used for *D. occidentalis* cells in mixed yeast culture resulted in higher viability of entrapped cells with comparable amylolytic and higher fermentative activities. Ethanol biosynthesis of immobilized *D. occidentalis* and free *S. cerevisiae* coculture was 24.6 g/L for unhydrolysed starch in a single-step fermentation what was 56% higher than the yield seen for monoculture of free cells of *D. occidentalis*.

This work was supported by KBN Grant 2PO6T 08129.

3. Czyzowska A, Okrajni J, Nowak A, Ambroziak W 2007 Isolation of β-glucosidase of *S.cerevisiae* wine yeast.

Aroma and colour are two important quality factors in wine. Monoterpenes play an important role in determining the aroma of grapes and wines, and anthocyanins are responsible for colour of resulting wines. β-glucosidase is a key enzyme in the enzymatic release of bound monoterpenols from their glycosidic precursors, but also responsible for anthocyanin decomposition. Several non-*Saccharomyces* produce and secrete enzymes to the periplasmic space and the medium. According to some reports, certain strains of *S.cerevisiae* also possess β-glucosidase activity. The aim of this study was to evaluate method of isolation of β-glucosidase from *S.cerevisiae* wine yeast (from the culture collection LOCK 05). Different methods of disintegration were used: mechanical – homogenization (homogenizer MPW 309 with a glass mill); physical – sonification (Ultrasonic homogeniser 4710); chemical – extraction with detergent (EDTA, Triton X-100, Tween 80, sodium cholate); combination of these methods. After disintegration samples were centrifuged and in pellet and supernatant enzymatic activity was assayed. Enzymatic activity was evaluated by determining the amount of pNP released from pNPG within an hour. Protein concentration was determined by Bradford method. Activity of β-glucosidase isolated from cells disintegrated with sodium cholate was about 30% higher than those from other methods. HPLC analysis also showed activity of this enzyme on anthocyanin cyanidin-3-glucoside. The following physiochemical and kinetic parameters useful for winemaking purposes were established: optimum temperature, optimum pH, Vmax and Km.

Poster presented at the Central European Symposium on Industrial Microbiology and Microbial Ecology – "Power of Microbes in Industry and Environment" 19-22 September 2007, Zadar, Croatia.

4. Kregiel D, Berlowska J, Ambroziak W 2007 Succinate dehydrogenase activity and ATP content as the parameters for studying of yeast cells vitality.

Succinate dehydrogenase (SDH) and ATP play a crucial role in the energy supply for physiological activity of every living cell, included microorganisms. Therefore these assays are the important methods for measurement of the yeast vitality in scope to control of different fermentation processes. Four yeast strains belonging to *Saccharomyces and Debaryomyces* species used in this study originated from the international collections LOCK 105 (Poland) and NCAIM (UK). ATP content was measured luminometrically by use of a luciferin/luciferase assay (Merck).The spectrophotometric method of SDH activity assay in yeast *Saccharomyces cerevisiae* was developed. The permeabilization of yeast cells by 0.05% digitonin permited to study yeast SDH activity *in situ*. Reduction of blue tetrazolium salt by dehydrogenase of active cells led to production of blue colored product – formazan. The linear correlation between permeabilized yeast cell density and amount of formed formazan was evidenced in the range from $9x10^7$ to $5x10^8$ cells per sample solution. This standarised procedure allows to estimate of SDH activity in whole cells, depending on vitality level of yeasts. The results obtained for SDH activity were in good agreement with that of ATP content in cells. Significant decreasing of SDH activity and ATP content were observed during aging of tested strains. The increasing of SDH activities were observed in sequential passages as the result of increase activity of strain and adaptation to cultivation conditions.

Poster presented at the 2nd Polish-Ukrainian Weigl Conference – "Microbiology in the XXI century", 24-26 September 2007, Warsaw, Poland.

5. Kregiel D, Berlowska J, Ambroziak W 2007 Surface charge and hydrophobicity of selected yeasts strains from different physiological states.

A critical first step of adhesion in immobilization procedure is microbial surface charge, which is in accordance with the needs for optimum interaction between the surface of carrier and surface of concrete microorganism. Determination of this charge is important in understanding and modelling of cells behaviour and function in immobilized state during various conditions of fermentation processes. Examination of the yeast surface charge and hydrophobicity of selected yeast strains derived from different physiological condition was a goal of our research. Experiments were performed with conventional distillery and brewery yeasts of *Saccharomyces cerevisiae* and unconventional amylolytic yeast strain of *Debaryomyces occidentalis*. Yeast cells were cultured in wort broth (Merck) at 25 °C with constant shaking and measurements were done at log phase of growth, at the beginning of stationary phase, after 24 hours starvation in Ringer solution and after 7-days fermentation trail. Relative yeast surface charge was evaluated by attachment of cells to Sephadex ion-exchangers and by Alcian Blue staining. Hydrophobicity was measured by the cells retention in xylene layer. When the yeast surface charge was determined by the method of alcian blue (AB) adhesion it was evident that all analyzed yeast strains from different phases of growth were naturally negatively charged, but the extent of AB adhesion was depended on physiological state of yeast strains. The more evidence of negative yeast surface charge came from experiments with yeast cells grown in exponential and stationary phase, which bound almost exclusively to DEAE-Sephadex ion-exchanger with above 99.8% yield for normal condition and above 96% yield for cells previously kept in starvation state during 24h. The yeast surface charge changed significantly from log to stationary phase and was affected also by starvation and fermentation. Maximal negative charge was observed for yeast

population from stationary phase of growth. The obtained results have shown how culture age and environmental condition can effect the cellular adhesion on solid carrier and how to choose suitable carrier or how to modified it surface for yeast immobilization in particular fermentation processes.

This research was supported by 6th FP grant PERCERAMICS –NMP3-CT-2003.

Poster presented at the Third International Conference "Advances in Processing, Testing and Application of Dielectric Materials", 26-28 September 2007, Wroclaw, Poland.

6. Szubzda B, Kregiel D, Berlowska J, Mazurek B, Adamowska M, Ambroziak W 2007 Dielectric properties of biological structures exemplified on yeast cells.

The paper presents the results of research which was an attempt to make use of natural biological structures occurring in yeast cells to elaborate a material characterized by high permittivity for various electrotechnical applications. Electric properties of living cells were tested in order to link the differences of the structure of cell walls and surface charge created on these walls with values of permittivity showed by them. Three yeast strains of *Saccharomyces and Debaryomyces* types were selected which had different values of a surface charge, determined with use of Alcian blue method and a value of permittivity coefficient determined with use of capacitative method. A considerable interdependence was found of both electrical values measured.

IV. Culture Collection of Yeasts, Institute of Chemistry, Dúbravská cesta 9, 845 38 Bratislava, Slovakia. Communicated by Emilia Breierova <chememi@savba.sk> www.chem.sk/yeast.

The following are abstracts of articles and lectures or posters that were published recently.

1. Karelin AA, Tsvetkov YuE, Kogan G, Bystricky S, Nifantiev NE 2007 Synthesis of oligosaccharide fragments of mannan from *Candida albicans* cell wall and their BSA conjugates. Russian J Bioorganic Chem 33:110–121.

3-Aminopropyl glycosides of α-D-manno-pyranosyl-(1→2)-α-D-mannopyranosyl-(1→2)-α-D-mannopyranosyl-(1→2)-α-D-manno-pyranose, α-D-mannopyranosyl-(1→3)-α-D-mannopyranosyl-(1→2)-α-D-manno-pyranosyl-(1→2)-α-D-mannopyranose, and α-D-manno-pyranosyl-(1→2)-[α-D-manno-pyranosyl-(1→3)]-α-D-manno-pyranosyl-(1→2)-α-D-mannopyranosyl-(1→2)-α-D-mannopyranose were efficiently synthesized starting from ethyl 2-O-acetyl(benzoyl)-3,4,6-tri-O-benzyl-1-thio-α-D-mannopyranoside, ethyl 4,6-di-O-benzyl-2-o-benzoyl-1-thio-α-D-manno-pyranoside, ethyl 4,6-diO-benzyl-2,3-di-O-benzyl-1-thio-α-D-mannopyranoside,and 2,3,4,6-tetra-O-benzoyl-α-D-mannopyranosyl bromide. The oligosaccharide chains synthesized correspond to the three structural type of side chains of mannan from *Candida albicans* cell wall. A conjugate of the third pentasaccharide with bovine serum albumin was prepared using the squarate method.

2. Mazáň M, Farkaš V 2007 Transglutaminase-like activity participates in cell wall biogenesis in *Saccharomyces cerevisiae*. Biologia 62:128-131.

Transglutaminases (TGases) catalyze the cross-linking between protein molecules by formation of an amide bond between *γ*-carboxyamide group of glutamine and the *å*-amine group of lysine under deamination of glutamine. We have demonstrated the participation of transglutaminase-like activity in the isolated cell walls and in the process of cell wall regeneration in protoplasts of the yeast Saccharomyces cerevisiae. A radioactive TGase substrate [^{3}H]putrescine was incorporated into the isolated cell walls and into the TCA-insoluble fraction in regenerating protoplasts. The incorporation was increased by adding exogenous artificial substrate of TGase-N,N'-dimethylcasein and was inhibited by TGase inhibitor cystamine and/or EDTA. These results suggest the existence of a TGase-type reaction involved in the formation of covalent cross-links between glycoprotein molecules during cell wall construction in *S. cerevisiae*.

3. Přibylová L, Farkaš V, Slaninová I, De Montigny J, Sychrová H 2007 Differences in osmotolerant and cell-wall properties of two *Zygosaccharomyces rouxii* strains. Folia Microbiol. 52:241-245.

Zygosaccharomyces rouxii is a highly osmotolerant yeast, closely related to *Saccharomyces cerevisiae*. The reason for its osmotolerance has not yet been discovered. One of the factors influencing the osmotolerance of a yeast cell is its cell wall. The two mostly studied wild-type *Z. rouxii* strains, CBS 732 and ATCC 42981, differ in their requirements for the treatment of their cell surfaces before electroporation, which suggests differences in their cell walls. In this paper, the osmotolerant and cell wall properties of the two *Z. rouxii* strains were studied. Differences in their tolerance to high salt content in the medium, their resistance to lysing enzymes Lyticase and Zymolyase, their cell-wall polymer content and the micromorphology of their cell walls were observed. The effect of a salt stress on the cell wall properties of the two strains was studied. The results obtained suggest that the less osmotolerant CBS 732 strain possesses a more rigid cell wall compared to the more osmotolerant ATCC 42981, whose cell wall seems to be more flexible and elastic.

4. Hrèková G, Velebný S, Kogan G 2007 Antibody response in mice infected with *Mesocestoides vogae* (syn. *M. corti*) tetrathyridia after treatment with praziquantel and liposomised glucan. Parasitol Res 100:1351-1359.

The therapeutic effect of praziquantel (PZQ) involves synergy with the humoral immune response during helminth infections, which is modulated by parasitic antigens. During experimental murine infections with the larval stage of cestoda *Mesocestoides vogae* (syn. *M. corti*), dynamic changes in the IgG and IM antibody serum levels to both soluble somatic and secretory larval antigens were investigated after administration of PZQ alone and after its coadministration with the immunimodulator (1→3)-β-D-glucan entrapped in liposomes (lip.glucan). During the two weeks of follow-up after termination of therapy, specific IgG and IgM serum levels to the somatic antigens (ELISA test) significantly decreased, whereas concentrations of the antibodies to the secretory antigens moderately increased, both in comparison with the control. Moreover, the number of immunogenic larval antigens (analysed by Western blot) was higher after combined therapy in comparison with single drugs administration, which correlated with the intensity of reduction of the larval counts in the liver and peritoneal cavity of mice. Our data showed that administration of PZQ alone and in combination with lip.glucan resulted in marked change in the dynamics of IgG and IgM antibodies to the somatic larval antigens, which were probably induced by the newly exposed antigens. In this respect, glucan can enhance chemotherapeutic activity of PZQ against larval cestodes by means of stimulation of the macrophage/monocyte effect or functions, which seemed to contribute to the more intense larval damage.

5. Kogan G, Kocher A 2007 Role of Yeast Cell Wall Polysaccharides in Pig Nutrition and Health Protection. Livestock Sci 109:161-165.

Polysaccharides are the major components of the yeast cell wall and play multiple functions, ranging from the carriers of immunochemical specificity and marker molecules, by which cells recognize each other and interact with the environment, to the skeletal substances that define stability, shape, and morphology of the cell. In *Saccharomyces cerevisiae*, the two major polysaccharides, constituting up to 90% of cell wall dry weight, are α-D-mannan and β-D-glucan, which have remarkable properties to interact with the immune system of the host. Modulation of mucosal immunity by the binding of these two polysaccharides to the specific receptors of immune cells provides beneficial effects on animal health and resistance to diseases. Specific commercial yeast cell wall polysaccharides supplied in feed (Bio-Mos®, Alltech Inc.) are able to block fimbriae of pathogenic bacteria, and thus prevent their adhesion to the mucous epithelium. Since adhesion presents the first step in microbial invasion, blocking of the receptors may prevent or eliminate infection. Yeast cell wall polysaccharides are also able to adsorb mycotoxins, thus decreasing their toxic effect and mediating their removal from the organism. Commercial yeast polysaccharides MTB100®, Alltech Inc.) have been shown to absorb a wide range of mycotoxins at low inclusion levels. Thus, especially if the ban on antibiotic growth promoters becomes global, use of yeast polysaccharides as natural growth stimulators becomes a very urgent and rewarding issue.

6. Schronerová K, Babincová M, Machová E, Kogan G 2007 Carboxymethylated (1→3)-β-D-glucan protects liposomes against ultraviolet light induced lipid peroxidation. J Medicinal Food 10:189-193.

In this study we have analyzed antioxidant capabilities of the carboxymethylated (1→3)-β-D-glucan ($M_w = 5.88 \times 10^5$) against lipid peroxidation induced by ultraviolet (UV) radiation-UVA (320-400 nm), which is known to produce mainly singlet oxygen, $^1O_2$. Lipid peroxidation was monitored by measuring the absorption spectra of the conjugated dienes and quantified by Klein oxidation index. The results imply that the (1→3)-β-D-glucan derivative studied is an antioxidant with the scavenging ability lying between α-tocoferol and hyaluronic acid. Thus, glucan as a potential safe and effective dietary supplement may be used for a prolonged time for a systemic photoprotection of humans.

7. Dudíková J, Mastihubová M, Mastihuba V, Kolarova N 2007 Exploration of transfructosylation activity in cell walls from *Cryptococcus laurentii* for production of functionalised β-D-fructofuranosides. J Mol Catal B: Enzymatic 45:27-33.

Cell wall preparations from a strain of the yeast *Cryptococcus laurentii* catalyse formation of β-D-fructofuranoides from sucrose. The enzyme preparation exhibits high stability and broad substrate specificity enabling use of a variety of aliphatic and phenolic primary alcohols as fructofuranosyl acceptors. Chemical yields range from 3 to 38% depending on reaction conditions and chemical nature of acceptor.

8. B Košíková, E Sláviková, V Sasinková, F Kačík 2006 The use of various yeast strains for removal of pine wood extractive constituents. Wood Res 51:47-54.

The yeast strains *Trichosporon pullulans*, *Cryptococcus albidus*, *Sporobolomyces* salmonicolor, and *Debaryomyces occidentalis* var. *occidentalis* isolated from plant material were cultured in a medium containing pine sawdust. Their ability to degrade extractives from Pinus sylvestris was examined by HPLC analysis and FTIR spectroscopy of acetone extracts obtained by the extraction of pine wood before and after yeast treatment. According to the obtained results, it was clearly demonstrated that the used yeast microorganisms remove about 60 % of wood extractives, mainly fatty and resin acids, steryl esters and triglycerides. The novel biotechnological method for pretreatment of wood by using yeasts resulting in reduction of lipophilic extractives could increase pulp quality and decrease effluent toxicity as well as minimize troubles caused by resins in pulp production.

9. R Vadkertiová and E Sláviková 2007 Killer activity of yeasts isolated from natural environments against some medically important *Candida* species. Polish J Microbiol 56:39-43.

Twenty-five yeast cultures, mainly of human origin, belonging to four pathogenic yeast species – *Candida albicans*, *Candida krusei*, *Candida parapsilosis*, and *Candida tropicalis* were tested for their sensitivity to ten basidiomycetous and eleven ascomycetous yeast species isolated from the water and soil environments and from tree leaves. The best killer activity among basidiomycetous species was exhibited by *Rhodotorula glutinis* and *R. mucilaginosa*. The other carotenoid producing species *Cystofilobasidium capitatum*, *Sporobolomyces salmonicolor*, and *S. roseus* were active only against about 40 % of the tested strains and exhibited weak activity. The broadest killer activity among ascomycetous yeasts was shown by the strains *Pichia anomala* and *Metschikowia pulcherrima.* The species *Debaryomyces castellii*, *Debaryomyces hansenii, Hanseniaspora guilliermondii, Pichia membranifaciens,* and *Williopsis californica* did not show any killer activity. The best killer activity exhibited the strains isolated from leafy material. The lowest activity pattern was found among strains originating from soil environment.

10. Dergunova MA, Zhanaeva SYa., Filatova TG, Korolenko TA, Kogan G 2007 Chemically modified polysaccharide protects against selective liver macrophage depression induced by gadolinium chloride. Bull Sib Otd. Ross Akad Med Nauk 1:71-75.

Carboxymethylated β-1,3-glucan (25 mg/kg) and chito-carboxymethylated glucan (25 mg/kg) single administration to mice was shown to protect against selective liver macrophage depression induced by gadolinium chloride (7.5 mg/kg, intravenous administration). Both β-1,3-glucan studied revealed signs of liver macrophage stimulation: increased number and phagocytic activity of liver macrophages, increased serum chitotriosidase activity. Model of selective liver macrophage depression was characterized by decreased number of liver macrophages and decreased serum chitotriosidase activity. Chito-KMG as well as zymosan increased uptake of gadolinium by liver cells during preliminary β-1,3-glucan administration. It was concluded that model of selective liver macrophage depression is useful for study the effects of modifiers of biological response (polysaccharides with a structure like β-1,3-glucan).

11. Paulovičová E, Machová E, Tulinská J, Bystrický S 2007 Cell and antibody mediated immunity induced by vaccination with novel *Candida dubliniensis* mannan immunogenic conjugate. Int Immunopharmacol 7:1325–1333.

Antigen-specific humoral response, as well as the induction of cellular immunity generated by *Candida dubliniensis* mannan–human serum albumin (HSA) conjugate, a novel proposed immunogenic structure for subcellular vaccine, were evaluated in rabbits. Mannan–HSA conjugate-induced specific IgG and IgA increased significantly after boosters (IgG: Pb0.001 and IgA: Pb0.01). Mannan–HSA conjugate up-regulation of cell-surface expression of B-lymphocyte and granulocyte activation antigens CD25 and CD11b indicated the effective activation. Immunogenic effect of conjugate on T lymphocytes was demonstrated via inductive increase of CD4+ T lymphocyte subset and CD4+/CD8+ ratio and via induction of TH1 cytokines. Immunogenic effectiveness of mannan–HSA conjugate at a dose of 0.25 mg of mannan antigenic moiety overcame that of the mannan alone and of yeast whole cells, thus promising further application in *Candida vaccine* development.

12. Breierová E, Gregor T, Marová I, Čertík M, Kogan G In press Enhanced antioxidant formula based on a selenium-supplemented carotenoid producing yeast biomass. Chem Biodiv.

Carotene-producing yeast species, such as *Rhodotorula glutinis* and *Sporobolomyces roseus* efficiently accumulated selenium from the growth medium. It was observed that incorporation of selenium into yeasts cells during the growth inhibited production of β-carotenoid and other carotenoid precursors (torularhodin and torulene). The yeasts with high content of the carotenoid pigments and selenium may be used for preparation of a new type of antioxidant formula that could be

directly applied for various human and animal diets. We have demonstrated that such formula can only be produced by separated processes of the cultivation of red yeasts and a subsequent sorption of selenium into the cells.

13. Kogan G, Miadoková E, Vlčková V, Slameňová D, Rauko P, Babincová M 2007 Immunomodulating, antioxidant, and antimutagenic properties of yeast cell wall polysaccharides. Poster P17, 1st International Fungal/Plant Cell Wall Meeting "Cell Wall Polysaccharides of Fungi and Plants", Biarritz, France, March 10-14, 2007. Book of abstracts, p. 87.

14. Kogan G, Miadoková E, Slameňová D, Babincová M, Rauko P, Korolenko TA 2007 Antioxidant, antimutagenic and antitumor activity of yeast cell wall polysaccharides. Plenary lecture, International Conference "Synthetic and Natural Compounds in Cancer Therapy and Prevention", Bratislava, March 28-30, 2007. Book of Abstracts, p. 26.

15. Pajtinka M, Kogan G, Sejáková Z, Dercová K 2007 Sorption of PCP by cell wall ß-D-glucan isolated from *Saccharomyces cerevisiae*. International Workshop "Current Chemistry and Biochemistry of Saccharides" Institute of Microbiology, Academy of Sciences of Czech Republic, Prague, Czech Republic, April 20, 2007. Book of Abstracts, p. 38.

16. Liepins L, Kogan G, Kováčová E, Rapoport A 2007 Some aspects of dessicated brewer's and baker's yeast β-D-glucans and their Immunological properties. Short Lecture, 26th International Specialized Symposium on Yeasts ISSY 26, Sorrento, Italy, June 3-7, 2007. Book of Abstracts, p. 41.

V. The International Centre for Brewing and Distilling, Heriot-Watt University, Riccarton, Edinburgh,Scotland EH14 4AS. Communicated by Graham G. Stewart.

I am retiring from Heriot-Watt at the end of this month and I think it is appropriate that I resign at the same time as one of the assistant editors of Yeast Newsletter. It is with mixed feelings that I relinquish my position with "Yeast" when I will be retiring from Heriot-Watt University at the end of November 2007. This follows over 40 years research on yeast and membership in the International Yeast Commission since 1976 (Commission Chairman 1980-84).

The following papers have appeared recently.

1. Stewart GG and Priest FG 2006 Microbiological similarities and differences between brewing and distilling. In: Proc. 29th Convention of the Institute of Brewing and Distilling, Asia Pacific Section, CD, Paper 14.

2. Stewart GG, Mader A, Chlup P and Miedl M 2006 The influence of process parameters on beer foam stability. Master Brewers Association of the Americas, Technical Quarterly 43:47-52.

3. Schlee C, Miedl M, Leiper KA and Stewart GG 2006 The potential of confocal imaging for measuring physiological changes in brewer's yeast. J Inst Brew 112:134-147.

4. Leiper KA, Schlee C, Trebble I and Stewart GG 2006 The fermentation of beet syrup to produce bioethanol. J Inst Brew 112:122-133.

5. Stewart GG 2006 Studies on the uptake and metabolism of wort sugars during brewing fermentations. Master Brewers Assoc of the Americas, Tech Quart, 43:265-269.

6. Pratt PL, Bryce JH, and Stewart GG 2007 The yeast vacuole–Its role during high gravity wort fermentations. J Inst Brew 113:55-60.

7. Chlup P.A. Bernard D. and StewartG.G. 2006. The disc stack centrifuge and its impact on yeast and beer quality. *Journal of the American Society of Brewing Chemists* ***65*** 29-37.

8. Chlup PA, Conery J and Stewart GG 2007 Detection of mannan from *Saccharomyces cerevisiae* by flow cytometry. J Amer Soc Brew Chem 65:151-156.

9. Lekkas C. Stewart GG, Hill AE, Taidi B and Hodgson J 2007 Elucidation of the role of nitrogenous wort components in yeast fermentation. J Inst Brew 113:3-8.

10. Miedl M, Cornfine S, Leiper KA, Shepherd M and Stewart GG 2007 Low-temperature processing of wheat for bioethanol production: Part I. Studies on the use of commercial enzymes. J Amer Soc Brew Chem 65:183-191.

11. Miedl M, Cornfine S, Leiper KA, Shepherd M and Stewart GG 2007 Low-temperature processing of wheat for bioethanol production: Part II. Exploitation of exogenous wheat enzymes. J Amer Soc Brew Chem 65:192-196.

12. Stewart GG 2007 The Influence of high gravity wort on the stress characteristics of brewer's yeast and related strains. Cerevisia Belg J Brew Biotechnol 32:32-48.

13. Stewart, GG, Yonezawa T and Martin S 2007 The influence of mashing conditions on the fermentation characteristics of all-malt wort to produce beer or whisky. Master Brewers Assoc Americas, Techl Quart 44:in press.

14. Chlup PA and Stewart GG 2007 An assessment of the physiological status of yeast during high and low gravity wort fermentations determined by flow cytometry. Master Brewers Assoc Americas, Tech Quart 44:in press.

VI. Rosenstiel School of Marine and Atmospheric Science, University of Miami, 4600 Rickenbacker Causeway, Miami, Florida USA 33149. Communicated by Jack W. Fell <jfell@rsmas.miami.edu>.

Recent publications.

1. Statzell-Tallman A, Belloch C, Fell JW - In press - *Kwoniella mangroviensis* gen. nov., sp. nov. a tremellaceous yeast from mangrove habitats in the Florida Everglades and Bahamas. FEMS Yeast Res.

Mangrove forests inhabit the shoreline regions of tropical and subtropical marine habitats, where they are the basis of a multi-trophic level food web that drives the shellfish and fisheries industries. Yeasts, and other fungi, have significant roles in these ecosystems as they decompose plant organic material and serve as a food source for small invertebrates. Studies designed to examine yeast communities of mangrove regions of the Florida Everglades and the Bahamas demonstrated the repeated presence of an undescribed teleomorphic basidiomycetous yeast. The yeast is heterothallic, with a sexual cycle that can be observed on artificial media. Mating between compatible pairs produces polymorphic basidia. Some basidia are globose, ovoid or lageniform, with longitudinal to oblique and transverse septa, whereas other basidia are navicular with one to three transverse septa. Basidiocarps and ballistoconidia are absent. Molecular sequence analysis of a partial region (D1/D2 domains) of the large subunit rRNA demonstrated that the yeast is phylogenetically distinct from other teleomorphic Tremellales with close relationships to the anamorphic species *Cryptococcus dejecticola, Cryptococcus bestiolae* and *Bullera dendrophila*. The molecular and phenotypic data indicate that this teleomorph should be classified in a novel genus. Therefore, *Kwoniella mangroviensis* gen. nov., sp. nov. (Type strain CBS 8507), is proposed.

2. Fell JW, Scorzetti G, Statzell-Tallman A , Boundy-Mills K - In press - Molecular diversity and intragenomic variability in *Xanthophyllomyce*s: the origin of *Phaffia rhodozyma*? FEMS Yeast Res (available on-line).

The teleomorphic basidiomycetous yeast *Xanthophyllomyces dendrorhous* is important as a commercial source of astaxanthin, which is a component of feeds for mariculture. *Phaffia rhodozyma* is the anamorphic state of *Xanthophyllomyces*; however, there are conflicting reports in the literature concerning the presence of a sexual cycle in *P. rhodozyma*. The current study attempted to explain this enigma. Strains were obtained from the Phaff Yeast Culture Collection (University of California, Davis) and other sources in the northern hemisphere. Molecular sequences of three nuclear rDNA regions were examined: the internal transcribed spacers (ITS), intergenic spacer (IGS1) and the D1D2 region at the 5' end of the 26S gene. Different levels of genetic variability were observed in the three regions. The D1D2 differentiated major groups of strains, while an increased variability in the ITS suggested that the ITS region could be employed as an ecological

marker. The greatest variability was in the IGS1 region, where strains can be defined by the presence and location of indels. Intragenomic sequence heterogeneity in the ITS and IGS1 regions led to the hypothesis that the type strain of *P. rhodozyma* (CBS 5905T, UCD 67-210T) was derived as a mating-deficient basidiospore from the parent teleomorphic strain CBS 9090.

3. Vogel C, Rogerson A, Schatz S, Laubach H, Tallman A, Fell JW 2007 Prevalence of yeasts in beach sand at three bathing beaches in South Florida. Water Research 41:1915-1920.

The abundance and types of yeasts in the wet and dry sand of three recreational beaches in South Florida were determined. Samples were collected on 17 occasions between August 2001 and July 2002. After analyzing 102 sand samples, a total of 21 yeast species were identified by molecular methods. These isolates comprised four Basidiomycetes and 17 Ascomycetes and included eight species that had previously been reported from humans. The most frequently encountered yeasts were *Candida tropicalis* and *Rhodotorula mucilaginosa*. A greater diversity of species (16 species) was found in the dry sand above the high tide mark compared with the wet sand in the intertidal zone (11 species). Densities were also highest in the dry sand relative to wet sand (20-fold higher at Hobie beach, 6-fold higher at Fort Lauderdale Beach and 1.3-fold higher at Hollywood beach). There were no clear temporal patterns in the data and overall densities were greatest at the busiest bathing beach (Hobie Beach) where total yeasts averaged 37,720 cfu 100g(-1) dry sand and 1852 cfu 100 g(-1) in the wet sand. This concentration of yeast was significantly higher than populations at the less populated beaches. Fort Lauderdale beach had a mean count of 4130 cfu 100 g(-1) dry sand and 705 cfu 100g(-1) in the wet sand while the least populated beach, Hollywood Beach averaged 1945 cfu 100g(-1) dry sand and 1483 cfu 100g(-1) wet sand. While definitive statements cannot be made, high levels of yeasts may have a deleterious bearing on human health and the presence of such a diverse aggregation of species suggests that yeasts could have a role as indicators of beach health.

VII. Russian Collection of Microorganisms (VKM), Institute for Biochemistry and Physiology of Microorganisms, Pushchino, 142290, Russia. Communicated by W.I. Golubev <wig@ibpm.pushchino.ru> http://www.vkm.ru.

Recent publications.

1. Golubev WI 2007 Mycocinogeny in smut yeast-like fungi of the genus *Pseudozyma*. Mikrobiologia 76: (6, in press).

The fungistatic agent secreted by *Pseudozyma prolifica* VKM Y-2835 shows activity against some representatives of the Ustilaginales under acidic conditions. This mycocin, with a molecular mass of no less than 15 kDa, is thermolabile and sensitive to proteolytic cleavage.

2. Golubev WI 2008 Taxonomical, ecological and geographical diversity of yeast cultures in the Russia Collection of Microorganisms (VKM). Priklanaya Biokhimiya i Mikrobiologia 44 (accepted).

The Russia Collection of Microorganisms (VKM) maintains 2500 yeast strains which represent more than 500 species of 100 genera and belong to the six classes of the Ascomycota and Basidiomycota. Type strains of almost all species are available. There are isolates from all continents but the majority of deposited strains is from Europe. The best-represented sources of isolation were plants, soils, food, wines and some industrial processes.

VIII. Laboratório de Microbiologia, Departamento de Botânica e Engenharia Biológica, Instituto Superior de Agronomia, 1349-017 Lisboa, Portugal. Communicated by M. Malfeito-Ferreira <mmalfeito@isa.utl.pt>.

Recent publications.

1. Barata A, Caldeira J, Botelheiro R, Pagliara D, Malfeito-Ferreira M and Loureiro V 2007 Survival patterns of *Dekkera bruxellensis* in wines and inhibitory effect of sulphur dioxide. Int J Food Microbiol (Accepted for publication).

The wine spoilage yeast species *Dekkera bruxellensis*, after inoculation in red wines, displayed three survival patterns characterised by: i) initial lag phase followed by growth and sequential death; ii) initial death phase leading to reduced viable counts followed by growth and sequential death; and iii) death phase leading to complete loss of viability. These survival patterns were observed for the same strain in different dry red wines blends with 12% (v/v) ethanol and pH 3.50, in the absence of free sulphur dioxide. For the same wine blend, these patterns also varied with the tested strain. Under laboratory conditions, the addition of 150 mg/l of potassium metabisulphite (PMB) to dry red wine with 12% (v/v) ethanol and pH 3.50, reduced initial cell counts by more than 6 logarithmic cycles, inducing full death within less than 24 h. Winery trials showed that *D. bruxellensis*

blooms were only prevented in the presence of about 40 mg/l of free sulphur dioxide in dry red wine, with 13.8% (v/v) ethanol and pH 3.42, matured in oak barrels. These different amounts of PMB and sulphur dioxide corresponded to about 1 mg/l of molecular sulphur dioxide. Therefore, our results demonstrate that the control of populations of *D. bruxellensis* growing in red wine can only be achieved under the presence of relatively high doses of molecular sulphur dioxide.

2. Costa A, Barata A, Malfeito-Ferreira M and Loureiro V 2007 Evaluation of the inhibitory effect of dimethyl dicarbonate (DMDC) against wine microorganisms. Food Microbiol (In press).

Several microbial species associated with wine were challenged against increasing concentrations of DMDC. The concentration inducing complete cell death upon addition to red wine was regarded as the minimum inhibitory concentration (MIC). In dry red wines with 12 % (v/v) ethanol and pH 3.50, the inactivation depended on the initial cell concentration. For an initial inoculum of 500 CFU/ml, the MIC of the yeasts species *Schizosaccharomyces pombe, Dekkera bruxellensis*, *Saccharomyces cerevisiae* and *Pichia guilliermondii* was 100 mg/l. The most sensitive strains belong to *Zygosaccharomyces bailii*, *Zygoascus hellenicus* and *Lachancea thermotolerans*, with MIC of 25 mg/l DMDC. For inoculation rates of about 106 CFU/ml, the maximum dose of DMDC legally authorised (200 mg/l) was not effective against the most resistant species. The addition of 100 mg/l potassium metabisulphite (PMB), equivalent to 1 mg/l molecular sulphur dioxide, increased the inactivation effect of 100 mg/l DMDC over initial yeast populations of 106 CFU/ml but did not fully kill *S. pombe* and *S. cerevisiae.* Lactic acid and acetic acid bacteria were not killed by the addition of 300 mg/l of DMDC. Trials performed in wines before bottling showed that in most samples indigenous bacterial populations were not affected by 200 mg/l DMDC. Therefore, under winery practice, DMDC at the maximum dose legally permitted may be regarded as an efficient preservative to control low contamination rates of yeasts but ineffective against lactic acid and acetic acid bacteria.

3. Barata A, Seborro F, Belloch C, Malfeito-Ferreira M and Loureiro V 2007 Ascomycetous yeast species recovered from grapes damaged by honeydew and by sour rot. J Appl Microbiol (In press).

Aims: identification of ascomycetous yeasts recovered from sound and damaged grapes by the presence of honeydew or sour rot.

Methods and Results: In sound grapes, the mean yeast counts ranged from 3.20±1.04 log CFU/g to 5.87±0.64 log CFU/g. In honeydew grapes, the mean counts ranged from 3.88±0.80 log CFU/g to 6.64±0.77 log CFU/g. In sour rot grapes counts varied between 6.34±1.03 and 7.68±0.38 log CFU/g. *Hanseniaspora uvarum* was the most frequent species from sound samples. In both types of damage, the most frequent species were *Candida vanderwaltii*, *H. uvarum* and *Zygoascus hellenicus*. The latter species was recovered in high frequency due to the utilisation of the selective medium DBDM. The scarce isolation frequency of the wine spoilage species *Zygosaccharomyces bailii* (in sour rotten grapes) and *Z. bisporus* (in honeydew affected grapes) could only be demonstrated by the use of the selective medium ZDM.

Conclusions: The isolation of several species only from damaged grapes indicates that damage constituted the main factor determining yeast diversity. The utilisation of selective media is required for eliciting the recovery of potentially wine spoilage species.

Significance and Impact of the Study: the impact of damaged grapes in the yeast ecology of grapes has been underestimated.

Book Review.

4. Malfeito-Ferreira M and Loureiro V 2007 Book Review of the "Handbook of Enology" edited by Ribereau-Gayon *et al.* (vols. 1 and 2). Food Microbiology, 24, 802-803.

The present "Handbook of Enology" is the last version of one of the most important books in the science and technology of winemaking. As emphasized by the authors it conveys a "Bordeaux perspective of Enology and the art of winemaking" that has been spread by researchers, students and technicians all over the old. In the Preface of the First Edition the authors explain that the purpose of the work is not to provide an exhaustive bibliography of each subject but to quote only the most relevant publications and those of French origin that are not easily available to an increasing number of non-French-speaking persons. The result is an impressive amount of information originating from a single school, practically impossible to match by other single teaching and research groups. Having this in mind, it is also understandable that some issues could have been approached in a deeper way but the absence of studies by the authors' team may explain the final outcome. Our field of studies is wine microbiology and so our comments are mainly concerned with the related chapters:

1. Ecology of grape and wine yeasts

Chapter 1 is mainly devoted to *S. cerevisiae* studies and few references are made to non-*Saccharomyces* species, especially those responsible for wine spoilage. The influence of grape health on yeast ecology is shortly mentioned in Chapter 10 (The grape and its maturation) and in Chapter 13 (White winemaking). We believe that the spreading of wine spoilage yeasts from the field to the bottle would deserve an integrated approach in a single chapter, given their importance to the maintenance of wine quality.

2. Physiological mechanisms

The biochemistry and bioenergetics of wine yeasts could have been better systematised. In Chapter 2 (Biochemistry of Alcoholic Fermentation) no reference is made to the proton-

motive force that is the driving force for ATP production. The mention appears in Chapters 5 and 6, related with lactic bacteria, first, incorrectly stated as "proton motor force" and afterwards, as "proton-motive force". Authors are aware that it is a real energy source for the cell but it is not clear that it also applies to yeasts. Another physiological issue is described in Chapter 3 (Conditions of yeast development) related with ethanol toxicity. Given the importance of this theme a general description of the mechanisms underlying ethanol toxicity is missing.

3. Spoilage yeasts, microbiological control and hygiene

The reference to the spoilage activities of yeasts is rather short taking into account that it is one of the most important microbiological issues affecting the quality during storage and bottling. The description of spoilage species is vague and the approach to the problems caused by *Dekkera/Brettanomyces* is almost exclusively dependent on the research carried out by the authors. The microbiological control is mentioned in Volume 2, chapter 11 (Filtration and Centrifugation), as a method to assess clarification quality which is a rather limited view of the real scope of microbiological control. The theme hygiene is also reduced to a short description in volume 2, chapter 13 (Aging in barrels), which is not in accordance with the present focus on hygienic procedures, good manufacturing practices, HACCP and related issues coming from the EU food legislators.

IX. Siegfried Laboratory, 2-270 Fu-jiyama-cho, Misasagi, Yamashina-ku, Kyoto 607-8422, Japan. Communicated by Haruhiko Mori <sl_hk_mori@ybb.ne.jp>.

Thank you very much, yeast researchers in the world. As of last year, I have retired from Andersen Service Co. Ltd., one of the famous bakery groups in Japan, with my reaching 70 years of age. Previously I served with Kikkoman Corp. and Noda Institute for Scientific Research where I worked on breeding and genetics of a salt tolerant *Zygosaccharomyces rouxii*, an industrially important yeast for soya sauce and miso fermentation. I am still very much interested in the development of functional foods fermented by yeasts and lactic acid bacteria, for example novel sourdoughs, and still currently study these topics on my own at the Siegfried Laboratory, named in the memory of the famous German yeast researcher, Prof. Dr. Siegfried Windisch, who gave me his valuable advice and encouragement.

Recently, I have received doctoral dissertations from two co-workers of my old research group, Mr. Yasuhiko Suezawa and Miss Miho Kawahata, respectively. The following are their doctoral theses and abstracts of recent publications.

1. Yasuhiko Suezawa (Fermentation and Food Research Branch, Kagawa, Prefectural Industrial Center, 1351-1 Nohma, Uchinomi-chou, Syouzu-gun, Kagawa 761-4421, Japan <js3501@pref.kagawa.lg.jp> 2007 Studies on Function of a Salt Tolerant Yeast, *Candida versatilis* in Miso and Soy Sauce Production, and Characteristics of the Red Pigment Producing Strains (in Japanese).

2. Y Suezawa, I Kimura, M Inoue, N Gohda, and M Sukuki 2006 Identification and typing of miso and soy sauce fermentation yeasts, *Candida etchellsii* and *C. versatilis*, based on sequence analyses of the D1D2 domain of the 26S ribosomal RNA gene, and the region of internal transcribed spacer 1, 5.8S ribosomal RNA gene and internal transcribed spacer 2. Biosci Biotechnol Biochem 70:348-354.

We analyzed sequences of the D1D2 domain of the 26S ribosomal RNA gene (26S rDNA sequence), and the region of internal transcribed spacer 1, 5.8S ribosomal RNA gene and internal transcribed spacer 2 (ITS sequence) of the miso and soy sauce fermentation yeasts, *Candida etchellsii* and *Candida versatilis*, in order to evaluate the usefulness of this sequence analysis for identification and typing of these two species. In the 26S rDNA sequence method, the numbers of base substitutions among *C. etchellsii* strains were up to 2 in 482 bp (99.6% similarity), and they were divided into three types (types A, B, and C). Those of *C. versatilis* strains were also up to 2 in 521 bp (99.6% similarity) and they were divided into three types (types 1, 2, and 3). In the ITS sequence method, those of *C. etchellsii* strains were zero in 433 bp (type a, 100% similarity). Those of *C. versatilis* were 5 in 409 bp (98.8% similarity), divided into 4 types (types I, II, III and IV). It was found that molecular methods based on the sequences of the 26S rDNA D1D2 domain and the ITS region were rapid and precise compared with the physiological method for the identification and typing of these two species.

3. Y Suezawa and M Suzuki 2007 Bioconversion of ferulic acid to 4-vinylguaiacol and 4-ethylguaiacol and of 4-vinylguaiacol to 4-ethylguaiacol by halotolerant yeasts belonging to the genus *Candida*. Biosc Biotechnol Biochem 71:1058-1062.

In order to examine the genesis of the characteristic flavors of soy sauce and miso, seven novel halotolerant yeast strains of two types, which showed convertibility of ferulic acid (FA) to 4-vinylguaiacol (4-VG) and to 4-ethylguaiacol (4-EG), were isolated from miso-koji and miso pastes. Two of these strains were identified as *Candida guilliermondii* (anamorph of

Pichia guilliermondii), and *Candida fermentati* (anamorph of *Pichia caribbica*), based on sequence analyses of a partial 26S ribosomal RNA gene and the region of internal transcribed spacers 1 and 2, and the 5.8S ribosomal RNA gene. Moreover, we also found three *Candida etchellsii* strains which showed convertibility of FA to 4-VG, but not 4-EG, and two atypical strains of *Candida versatilis* which showed no convertibility of FA to 4- VG, but did show convertibility of 4-VG to 4-EG from soy sauce mashes. The bioconversion pathway from FA to 4-EG via 4-VG in halotolerant yeasts and bacteria is discussed.

4. M Kawahata (National Research Institute of Brewing, 3-7-1, Kagamiyama, Higashi-Hiroshima 730-0046, Japan <kawahata@nrib.go.jp> 2007 Studies on the Applications of Industrial Yeasts to Food Industry Based on their Characterizations.

5. M Kawahata, K Masaki, T Fujii and H Iefuji 2006 Yeast genes involved in response to lactic acid and acetic acid : acidic conditions caused by the organic acids in *Saccharomyces cerevisiae* cultures induce expression of intracellular metal metabolism genes regulated by Aft1p. FEMS Yeast Res 6 :924-936.

We found that the acidic condition affects metal metabolism in this study using two types of genome wide analysis to investigate yeast genes involved in response to lactic acid and acetic acid. One is an expression analysis using DNA microarray to investigate yeast acid shock response as the first step to adapt to an acidic condition and yeast acid adaptation response as the result of maintaining integrity in the acidic condition. The other is a functional screening using the non-essential genes deletion collection of S. cerevisiae. The expression analysis showed that genes involved in stress response such as YGP1, TPS1, and HSP150 were induced under the acid shock response conditions. Genes such as FIT2, ARN1, and ARN2 involved in metal metabolism regulated by Aft1p were induced under the acid adaptation conditions. AFT1 was found to be induced under the acid shock response conditions and under the acid adaptation condition by lactic acid. Moreover, GFP-fused Aft1p was localized to the nucleus in cells grown in media containing lactic acid, acetic acid, or hydrochloric acid. The expression analysis and the functional screening both suggested that the acidic condition affects cell wall architecture. The depletion of cell wall components encoded by SED1, DSE2, CTS1, EGT2, SCW11, SUN4, and YNL300W and histone acetyltransferase complex proteins encoded by YID21, EAF3, EAF5, EAF6, and YAF9 increased resistance to lactic acid media. Depletion of the cell wall mannoprotein Sed1p gave resistance to lactic acid, although the expression of SED1 was induced by exposure to lactic acid. Depletion of V-ATPase and HOG MARK proteins caused acid sensitivity. Moreover, our quantitative PCR analysis showed that expression of PDR12 increased under the acid shock response condition by lactic acid and decreased under the acid adaptation condition by hydrochloric acid.

6. M Kawahata, T Fujii and H Iefuji 2007 Intraspecies diversity of the industrial yeast strains *Saccharomyces cerevisiae* and *Saccharomyces pastorianus* based on analysis of the sequences of the internal transcribed spacer (ITS) regions and the D1/D2 region of 26S rDNA. Biosci Biotechnol Biochem 71:1616-1620.

We divided industrial yeast strains of *Saccharomyces cerevisiae* into three groups based on the sequences of their internal transcribed spacer (ITS) regions. One group contained sake yeasts, shochu yeasts, and one bakery yeast, another group contained wine yeasts, and the third group contained beer and whisky yeasts, including seven bakery yeasts. The three groups were distinguished by polymorphisms at two positions, designated positions B and C, corresponding to nucleotide numbers 279 and 301 respectively in the S288C strain. The yeasts in the Japanese group had one thymine at position B and one thymine at position C. The wine yeasts had one thymine at position B and one cytosine at position C. And the beer and whisky yeasts had two thymines at position B and one cytosine at position C. Strains of *S. pastorianus* were divided into three groups based on the sequences of their 26S rDNA D1/D2 and ITS regions.

7. M Kawahata, K Masaki, T Fujii and H Iefuji - Low pH affects a yeast iron metabolism through Aft1p. (submitted).

X. State Scientific-Research Institute for Genetics and Selection of Industrial Microorganisms (GosNIIgenetika), I-Dorozhnyi 1, Moscow 117545, Russia. Communicated by G.I. Naumov and E.S. Naumova <gnaumov@yahoo.com>.

We are grateful to the Organising Committee of 15 CEM for financial support to participate in the XV Congress of European Mycologists, Saint Petersburg, Russia, September 16-21, 2007. Many thanks to S.A. Kishkovskaya for fruitful collaboration on studying wine yeasts of Crimea (Ukraine).

The following are publications for 2007 or in press.

1. Naumova ES, Serpova EV, Korshunova IV, Naumov GI 2007 Molecular genetic peculiarities of the yeast *Lachancea kluyveri*. Microbiology (Moscow), 76:317–323.

2. Ivannikova YuV, Kondratieva VI, Naumov GI 2007 Hybridization analysis of geographic populations of *Saccharomyces paradoxus*. Mikologiya i Fitopatologiya, 41:130-134 (in Russian).

Genetic hybridization analysis of the yeasts *Saccharomyces paradoxus*, isolated in different regions of the world (Europe, Far East Asia, and North America) has been conducted. The strains studied were crossed in various combinations. Intra-population hybrids were characterized by high ascospore viability (79–91%), whereas ascospore viability of inter-population hybrids was considerably lower (22–65%). Both types of hybrids showed normal meiotic segregation of control auxotrophic markers. The obtained results must be the evidence of partial reproductive isolation of *S. paradoxus* strains of different geographical origin. Divergent geographical populations of this species are probably the early stages of speciation.

3. Naumov GI, Vasilieva SA, Chernov IYu 2007 Aerobic maltose utilization in the yeast *Saccharomyces paradoxus*, *S. mikatae*, *S. kudriavzevii* and *S. cariocanus*. Mikologiya i Fitopatologiya 41:536-540 (in Russian).

4. Naumov GI, Vasilieva SA 2007 Maltose assimilation in *Saccharomyces cerevisiae* yeast depends on respiration. Biotechnologiya, 4:31-33 (in Russian).

5. Naumova ES, Serpova EV, Naumov GI 2007 Molecular systematics of the yeast *Lachancea*. Biochemistry (Moscow), 72 (12): 1674-1682 (in Russian, will be translated in English).

Molecular analysis of yeasts from the new genus *Lachancea* Kurtzman (2003) has been conducted. Comparative study of ribosomal sequences and molecular karyotyping revealed genetic homogeneity of the genus *Lachancea*. Seven *Lachancea* species appear to have the same haploid number of chromosomes - eight. However, individual chromosomes were very different in size in different species. The sizes of chromosomes ranged from 400 to 2800 kb in *L. cidri* and from 1400 to 2800 kb in *L. waltii.* Intra- and interspecies chromosome length polymorphism of *Lachancea* yeasts is discussed.

6. Ivannikova YuV, Naumova ES, Naumov GI 2007 Viral dsRNA in the wine yeast *Saccharomyces bayanus* var. *uvarum*. Research in Microbiology (in press).

The presence of viral dsRNA (L and M fractions) in the cryophilic yeast *Saccharomyces bayanus* var. *uvarum* is documented here for the first time. Sixty-eight strains of different origins were analyzed. Most of them did not carry dsRNA; the L fraction was found in seven strains, while 11 strains had both L and M fractions. The size of the L fraction was invariable (4.5 kb), as in the cultured yeast *Saccharomyces cerevisiae*. In contrast to L-dsRNA, the M fraction varied in size from ca. 1.2 to 1.8 kb. In total, seven different M-dsRNA types were recognized (M1-M3 and M8-M11), predominantly among French wine strains of *S. bayanus* var. *uvarum*. Phenotypic analysis revealed that the M-dsRNAs found were cryptic and may represent mutant forms of killer plasmids.

7. Naumov GI 2007 Evolutionary mycology: molecular and genetic taxonomy of yeast-like fungi. In: XV Congress of European Mycologists, September 16-21, 2007, Saint Petersburg, Russia, p 25.

8. Naumova ES 2007 Evolutionary genomics of *Saccharomyces* yeasts. In: XV Congress of European Mycologists, September 16-21, 2007, Saint Petersburg, Russia, p 51.

9. Naumov GI 2007 Genetic bases of yeast breeding. In: From alcoholic beverages to bioethanol for transportation: a new challenge for fermenting yeasts, 26th International Specialized Symposium on Yeasts (ISSY26), June 3-7, 2007, Sorrento, Italy, p 68.

10. Naumova ES 2007 Comparative analysis of genomes of indigenous interspecies *Saccharomyces* hybrids. In: From alcoholic beverages to bioethanol for transportation: a new challenge for fermenting yeasts, 26th International Specialized Symposium on Yeasts (ISSY26), June 3-7, 2007, Sorrento, Italy, p 74.

XI. National Collection of Agricultural and Industrial Microorganisms (NCAIM), Corvinus University of Budapest, Faculty of Food Sciences, H-1118 Budapest, Somlói út 14-16, Hungary. Communicated by G. Péter <gabor.peter@uni-corvinus.hu>.

The following articles have been published since our last report.

1. Péter, G, Dlauchy D and Tornai-Lehoczki J 2006 *Candida floccosa* sp. nov., a novel methanol-assimilating yeast species. International Journal of systematic and Evolutionary Microbiology 56:2015-2018.

Two methanol-assimilating yeast strains were isolated from a flux of a sessile oak (*Quercus petrea*) in Hungary and one genetically and phenotypically very similar strain from a flux of a red oak (*Quercus rubra*) in Canada. The strains exhibited ascomycetous affinity but ascospore formation was not observed. On the basis of the sequence of their D1/D2 domain of the large subunit rDNA, as well as of their physiological characteristics, they represent a novel yeast species of the genus *Candida*. Therefore *Candida floccosa* sp. nov. is proposed, with NCAIM Y.01581^T (=CBS 10307^T=NRRL Y-27951^T) as the type strain.

2. Péter G, Tornai-Lehoczki J, Shin KS & Dlauchy D 2007 *Ogataea thermophila* sp. nov., the teleomorph of *Candida thermophila*. FEMS Yeast Res. 7:494-496.

Ascospore formation was observed in the type strain of *Candida thermophila* Shin K-S, Shin YK, Yoon and Park on some yeast sporulation media. In addition, a further sporulating strain was found that proved to be conspecific with *C. thermophila* on the basis of sequences of the D1/D2 domain of the large-subunit (26S) rRNA gene and the internal transcribed spacer (ITS)1–5.8S rRNA gene – ITS2 region. Therefore, *Ogataea thermophila* Péter, Tornai-Lehoczki, Shin K-S & Dlauchy sp. nov. is proposed as the teleomorph of *C. thermophila*. The type strain is Y94^T=JCM 10994^T=KCCM 50661^T=KCTC 17233^T.

3. Péter G, Tornai-Lehoczki J and Dlauchy D 2007 *Ogataea allantospora* sp. nov., an ascomycetous yeast species from phylloplane. Antonie van Leeuwenhoek. 92:443–448.

Following a two-step enrichment in methanol containing broth, methylotrophic yeast strains were isolated from about 45% of the leaf samples collected from broad leafed deciduous trees and from herbs in Hungary. During the enrichment process protists predating the yeasts were observed. Based on standard phenotypical tests and the D1/D2 domain sequences of the large subunit (26S) rDNA of the yeast strains recovered from the phylloplane, some of them represent previously unknown species. The description of a new methylotrophic yeast species, *Ogataea allantospora* [type strain: NCAIM Y.01822^T (CBS 10576, NRRL Y-48267)], isolated from phylloplane is given. The proposed new species is the first member of the genus which forms allantoid ascospores, therefore the emendation of the diagnosis of the genus *Ogataea* Yamada, Maeda & Mikata is proposed.

XII. Institut für Angewandte Mikrobiologie, Univ.f.Bodenkultur Wien. Communicated by Hansjörg Prillinger <hansjoerg.prillinger@boku.ac.at> http://www.boku.ac.at/iam.

I have now retired from the Institute. The following are our recent publications.

1. H Prillinger, K Lopandic, T Sugita, M Wuczkowski 2007 *Asterotremella* gen. nov. *albida*, an anamorphic tremelloid yeast isolated from the agarics *Asterophora lycoperdoides* and *A. parasitica*. J Gen Appl Microbiol 53:167-175.

Using a genotypic approach (PCR-fingerprinting, DNA/DNA reassociation, partial sequences of the 26S rDNA gene, complete sequences of the 18S rDNA gene, and sequences of the internal transcribed spacers) five tremelloid yeast isolates from the agarics *Asterophora lycoperdoides* and *A. parasitica* were shown to be conspecific with *Cryptococcus ramirezgomezianus*. It was not possible to distinguish the yeast strains from *A. lycoperdoides* and *A. parasitica* using sequences from the intergenic spacer (IGS1). Phylogeny based on the 26S (D1/D2-domain), ITS1-5.8S- ITS2 and complete 18S rDNA demonstrated that *C. ramirezgomezianus* is closely related to several additional *Cryptococcus* species (*C. humicola*, *C. longus*, *C. musci*, *C. pseudolongus*) within the Trichosporonales. A new genus, *Asterotremella*, and a new family, Asterotremellaceae were introduced for *Cryptococcus* species clustering within the Trichosporonales having a ubiquinone Q-9. *Cryptococcus ramirezgomezianus* is a synonym of *Asterotremella albida*.

2. O Molnár, M Wuczkowski, H Prillinger Yeast biodiversity in the guts of several pests on maize; comparison of three methods: classical isolation, cloning and DGGE. Mycological Progress (as manuscript)

The yeast biodiversity in the guts of several pests on maize from two isolation sources was assessed by cultivation-dependent and -independent methods. The 97 isolated yeast strains gave 21 different partial sequence types of the 26S rRNA gene which could be assigned to 10 different genera. The determined genera and species are discussed in the meaning of their taxonomic status or their occurrence in the nature. The cultivation-independent methods, cloning and DGGE, were compared. We propose the combination of cloning and DGGE, and furthermore the linkage of both cultivation-independent and -dependent approaches for better insights into fungal biodiversity.

XIII. CREM – Centro de Recursos Microbiológicos, Departamento de Ciências da Vida, Faculdade de Ciências e Tecnologia, Universidade Nova de Lisboa, 2829-516 Caparica, Portugal. Communicated by J. P. Sampaio <jss@fct.unl.pt>.

The following papers have been recently published or are in press.

1. Hibbett D *et al*. (47 other authors) 2007 A higher-level phylogenetic classification of the Fungi. Mycoll Res 111:509-547.

2. Margesin R, Fonteyne PA, Schinner F and Sampaio JP 2007 Novel psychrophilic basidiomycetous yeast species from alpine environments: *Rhodotorula psychrophila* sp. nov., *Rhodotorula psychrophenolica* sp. nov., and *Rhodotorula glacialis* sp. nov. Int J Syst Evol Microbiol 57:2179-2184.

3. Valério E, Gadanho M and Sampaio JP 2007 *Sporidiobolus johnsonii* and *Sporidiobolus salmonicolor* revisited. Mycological Progress (in press).

The relationship between *Sporidiobolus johnsonii* and *S. salmonicolor* was investigated using rDNA sequence data. Two statistically well-supported clades were obtained. One clade included the type strain of *S. johnsonii* and the other included the type strain of *S. salmonicolor.* However, some mating strains of *S. salmonicolor* were found in the *S. johnsonii* group. These strains belonged to mating type A2 and were sexually compatible with mating type A1 strains from the *S. salmonicolor* group. DNA-DNA reassociation values were high within each clade and moderate between the two clades. In the re-investigation of teliospore germination we observed that the basidia of *S. salmonicolor* were two-celled. In *S. johnsonii* basidia were not formed and teliospore germination resulted in direct formation of yeast cells. We hypothesize that the *S. johnsonii* clade is becoming genetically isolated from the *S. salmonicolor* group and a speciation process is presently going on. We suspect that the observed sexual compatibility between strains of the *S. johnsonii* and *S. salmonicolor* groups and the possible genetic flux between the two species has little biological relevance because distinct phenotypes have been fixed in the two taxa and intermediate (hybrid) sequences for LSU and ITS rDNAs have not been detected.

4. Valério E, Gadanho M and Sampaio JP 2007 A reappraisal of the *Sporobolomyces roseus* species complex and description of *Sporidiobolus metaroseus* sp. nov. Intl J Syst Evol Microbiol (in press).

Here we investigate a group of red to pinkish ballistoconidia-forming yeasts preliminarily identified as *Sporobolomyces roseus* or *Sporidiobolus pararoseus*. Detailed molecular and micromorphological studies revealed that the sexual strains and several conspecific anamorphic isolates belonged to a new teleomorph that represents the sexual stage of *Sporobolomyces roseus.* Consequently, a new taxon in the genus *Sporidiobolus* is here described as *Sporidiobolus metaroseus* sp. nov. The main characteristics of *Sporidiobolus metaroseus* are presented and compared with those of the more closely related species. Our studies led also to the clarification of the life cycle of *Sporidiobolus pararoseus*. We confirmed that the teliospores of this species germinate by forming short branches of hyphae, instead of basidia.

XIV. Département Bioprocédés et Systèmes Microbiens, UMR-CNRS 5503. 5, rue Paulin Talabot. 31106. Toulouse cedex. France. Communicated by P. Strehaiano <Pierre.Strehaiano@ensiacet.fr>.

The following papers from our department have recently been published ore are in press.

Book chapter.

1. Strehaiano P, Ramon-Portugal F, Taillandier P 2006 Chapitre 9: Yeasts as biocatalysts. In: The Yeast Handbook - Yeasts in Food and Beverages, pp 243-283. Fleet G and Querol A, Eds. Springer Verlag Ed., 2006.

Publications.

2. Barbin P, Strehaiano P, Taillandier P 2007 Méthodologie de dépistage et d'isolement de *Brettanomyces* sur le raisin : application à l'échelle parcellaire. Revue des Oenologues 124:57-60.

3. Taillandier P, Ramon-Portugal F, Fuster A, Strehaiano P 2007 Effect of ammonium concentration on alcoholic fermentation kinetics by wine yeasts for high sugar content. Food Microbiol 24:95-100.

4. Renouf V, Strehaiano P, Lonvaud Funel A 2008 Effectiveness of dimethyldicarbonate to pevent *Brettanomyces bruxellensis* growth in wine. Food Control 19:208-216.
Online at **www.sciencedirect.com**.

5. Nehme N**,** Mathieu F**,** Taillandier P 2007 Co-culture of *Saccharomyces cerevisiae* and *Oenococcus oeni*: a new strategy for the improvement of malolactic fermentation. Studies in membrane bioreactor under different gaz conditions. VIII° Symposium Oenologie, Bordeaux, 25 - 27 juin 2007. In press. In: Œnologie 2007, Lavoisier Tec. & Doc. (Ed), Paris.

6. Salameh D, Brandam C, Medawar W, Lteif R, Strehaiano P 2007 Influence de l'étape de croissance et de la quantité de *Brettanomyces bruxellensis* sur la production d'éthyl-phénols, VIII° Symposium Oenologie, Bordeaux, 25 - 27 juin 2007. In press. In: Œnologie 2007, Lavoisier Tec. & Doc. (Ed), Paris.

PhD thesis.

7. Claudia Castro-Martinez 2007 *Brettanomyces bruxellensis* : étude métabolique, cinétique et modélisation. Influence des facteurs environnementaux. Doctorat Génie des Procédés. INPT. Juin 2007.

Two strains of *Brettanomyces bruxellensis* were studied from metabolic and kinetic point of view. One of them was isolated from a beet alcohol distillery, the other one from a winemaking unit. Influence of industrial environmental factors was analyzed, by the way of experimental plan methodology. Kinetics and stoichiometries observed were accurately represented by a model associating the logistic law and Luedeking and Piret formalism. It was also proposed a reaction scheme valid for the tested strains and operative conditions.

XV. Lawrence Berkeley National Laboratory, Berkeley, CA, USA. Communicated by T. Torok <ttorok@lbl.gov>.

Poster presented at the American Society of Microbiology General Meeting, 2007.

1. KL Boundy-Mills, I McDaniel, and T Torok. Novel yeast species available from the Phaff Yeast Culture Collection at the University of California Davis.

Background: Circumscription of a novel yeast species is best accomplished with a deep understanding of both physiological variability and ecological distribution. Many yeast species descriptions, however, are published based on a small number of isolates due to limited availability of strains. The Phaff Yeast Culture Collection at the University of California Davis contains over 7,000 yeasts isolated and characterized by the eminent yeast taxonomist, Herman Phaff (1913-2001) and colleagues. Although he published 50 species descriptions during his career, dozens of additional novel species in the collection await publication. Public access to biomarker DNA sequence data and corresponding yeast cultures can encourage collaboration between laboratories and publication of species descriptions based on a larger, more diverse set of strains.

Methods: Thousands of yeast strains were gathered over many decades by Phaff and colleagues, and characterized by traditional physiological and morphological analysis. Biomarker DNA sequencing was recently performed on hundreds of yeasts that did not match known species at the time of morphological and biochemical analysis. The 600-bp D1/D2 region of the large (26S) ribosomal subunit RNA-coding gene was sequenced and compared to known yeast species sequences available through public DNA sequence databases.

Results: About 100 strains had over 3% sequence divergence within the approximately 600-bp region, and thus likely belong to new yeast species. Representative sequences have been deposited into GenBank. The research community will have access to these yeasts for the purpose of publication of yeast species descriptions. Detailed geographic and habitat source information, and physiological characteristics, are also available.

Conclusion: Some recent species description publications by other researchers could have benefited from access to additional yeast strains from the Phaff collection. Public access to biomarker DNA sequences of these novel species will facilitate novel yeast species circumscription and alert future researchers of the availability of these strains.

XVI. Department of Biology, University of Western Ontario, London, Ontario, Canada N6A 5B7. Communicated by M.A. Lachance <lachance@uwo.ca>.

The following papers have now appeared in print.

1. Lachance MA 2007 Current Status of *Kluyveromyces* Systematics. FEMS Yeast Res 7:642–645.

2. Thorn RG, Scott J, Lachance MA 2007 Methods for studying terrestrial fungal ecology and diversity, p. 929-951. In Reddy CA, Beveridge TJ, Breznak JA, Marzluf GA, Schmidt TM, Snyder LR (editors), Methods for General and Molecular Microbiology, 3rd ed. ASM Press, Washington, DC.

3. Rosa CA, Pagnocca FC, Lachance MA, Ruivo CCC, Medeiros AO, Pimentel MRC, Fontenelle JCR, Martins RP 2007 *Candida flosculorum* and *Candida floris*, two novel yeast species associated with tropical flowers. Int J Syst Evol Microbiol 57:2970-2974.

Two ascomycetous yeast species, *Candida flosculorum* sp. nov. and *Candida floris* sp. nov., were isolated from tropical flowers and their associated insects. *C. flosculorum* was isolated from flower bracts of *Heliconia velloziana* and *Heliconia episcopalis* (Heliconiaceae) collected from two Atlantic rain forest sites in Brazil. *C. floris* was isolated from flowers of *Ipomoea* sp. (Convolvulaceae) growing on the banks of the river Paraguai in the pantanal ecosystem in Brazil and from an adult of the stingless bee *Trigona* sp. and a flower of *Merremia quinquefolia* (Convolvulaceae) in Costa Rica. *C. flosculorum* belongs to the Metschnikowiaceae clade and *C. floris* belongs to the *Starmerella* clade. The type strain of *C. flosculorum* is UFMG-JL13^T (= CBS 10566^T = NRRL Y-48258^T) and the type strain of *C. floris* is UWO(PS) 00-226.2^T (= CBS 10593^T = NRRL Y-48255^T).

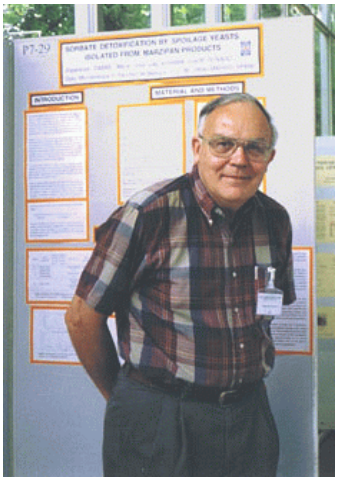
The following paper is in press.

4. Lachance MA & Starmer WT - In press - The yeast genus *Kurtzmaniella* gen. nov. and description of the heterothallic, haplontic species *Kurtzmaniella cleridarum* sp. nov., the teleomorph of *Candida cleridarum*. Int J Syst Evol Microbiol (Accepted September 2007).

The teleomorph of *Candida cleridarum* was discovered through the detection of conjugation between isolates of a large collection from the nitidulid beetles of the genus *Carpophilus* found in the flowers of various cacti in Arizona. The previous oversight of the sexual cycle of this yeast is attributed to the inequality (ca. 5:1) of the two mating types. Extensive conjugation between compatible mating types is observed after overnight incubation on 5 % malt agar, followed after 3–5 days by the formation of mature asci. The hat-shaped ascospores are reminiscent of those seen in *Kodamaea* species, which are members of the same guild. However, published analyses of D1/D2 large subunit ribosomal DNA sequences indicates an affinity with the genus *Debaryomyces*. As the latter is polyphyletic and morphologically heterogeneous, and in view of the distinct life cycle of the new teleomorph, the new genus *Kurtzmaniella* is described. Given the close relatedness of *Kurtzmaniella cleridarum* to *Candida quercitrusa*, *Candida oleophila*, and *Candida railenensis*, for which several natural isolates were available, strains of these species were mixed in pairs under the conditions found favourable for the former. Conjugation was not detected in those species. The type strain of *Kurtzmaniella cleridarum* is UWOPS 99-101.1^T (CBS 8793^T, NRRL Y 48386^T, h^+), type of *Candida cleridarum*. The allotype is UWOPS 07-123.1 (CBS 10688, NRRL Y 48387, h^-).

Obituaries

Professor Robert K. Mortimer (1927-2007)



On August 10, 2007, the [U.C. Berkeley] campus community lost Robert (Bob) K. Mortimer, one of its kindest, most generous, members who is justly credited as being the father of his field. Bob's pioneering work led to thousands of scientific careers dedicated to the study of that glorious microbe, the yeast *Saccharomyces cerevisiae*, responsible for such pleasures of life as beer, bread, wine.

Prior to his time at Berkeley, Mortimer was a promising graduate of the University of Alberta with undergraduate honors in both Mathematics and Physics. With a surplus of talent and interest he considered pursing a career in oil and gas exploration in Alberta, which time has proven could have been an immensely successful decision. Fortunately for Berkeley, he chose to come here for his Ph.D., working with Cornelius Tobias as his advisor to study the impact of radiation on the survival of cells. Tobias had an idea that the more copies of each chromosome that a cell had, the more resistant it should be to the harmful impact of X-rays. In the tradition of the very best graduate students, Bob quickly showed that his advisor's favorite idea was wrong. Using yeast cells, and the rudimentary genetic methods of the day, in the early 50's Mortimer created strains of yeast with one, two, three or four copies of each chromosome. Tobias expected these genetically buffed strains to resist the damage of X-rays. Instead, Mortimer discovered that more chromosomes led paradoxically to greater X-ray sensitivity, which led to his now famous studies of the many processes that all cells have to protect them from various physical and chemical damages to their DNA. Indeed, the so called RAD genes that were discovered in these studies are the foundation of most contemporary studies of how higher cells repair damage to their DNA. During the course of these studies, he was advanced to a faculty position at Berkeley, where he remained for his entire career. For most of the time, his office and lab were in Donner Hall, where he kept his door open to all who shared his interests in yeast genetics.

Yeast chromosomes are tiny compared to the chromosomes of other related organisms and hence did not lend themselves well to the cytogenetic methods that dominated studies of *Drosophila*, Maize and *Neurospora*, other important organisms for genetic research in the 50's and since. Mortimer realized that a genetic map of yeast would be required to figure out just what X-rays did to chromosomes that led to cell death, and set out to create such a genetic map. He reasoned that since fungi usually have only a handful of chromosomes, the creation of a genetic map would not take all that long. However, *Saccharomyces* yeast turned out to have 16 chromosomes, which made the construction of a genetic map to be much more challenging. By the mid 70's, however, Mortimer had a workable map with multiple mutations marking all the chromosomes.

Even with a workable genetic map, *Saccharomyces* would have languished as an experimental organism except for another of Bob's remarkable contributions, this time of an entirely technical nature. Unlike other fungi whose meiotic spores virtually explode out of the ascus to make their isolation and cultivation easy, the four spores from Saccharomyces' meiosis are born in an ascus that seems to be armor plated. The microdissecting needles used to isolate one spore form others can seldom break an ascus, making the analyses of even a few *Saccharomyces* meioses exceedingly difficult, and only for those with nerves of steel and stubborn persistence. Mortimer reasoned that all forms of life are eaten by something and hence some creature must be able to digest Saccharomyces asci. With great ingenuity, he and his colleague Johnston in 1959 discovered that if they extracted the juice from the guts of snails, that juice could be used to digest the asci, liberating the spores for genetic analysis. Although inconvenient for the snails, this insight threw open the power of genetic studies using yeast. Rather than analyzing a few meioses, it was now possible for one person to analyze thousands of meioses, which Mortimer, his students and post-doctoral fellows have done.

The ability to analyze thousands of meioses led to the discovery and characterization of gene conversion in *Saccharomyces*. This process allows the information on one chromosome to be essentially copied into the homologous chromosome, replacing the information that was there. Mortimer and colleagues, including notably Seymour Fogel of the Genetics Department, produced the wealth of data on gene conversion that eventually led, along with work of many others, to the methods that now allow precise gene replacements to be done in many different organisms.

Yeast divide by budding, leading to populations of genetically identical cells. However in 1959 Mortimer and Johnston discovered in their now famous Nature paper that individual cells in a culture of yeast can have very different life spans, depending upon whether the cell is a mother cell or a bud. To our knowledge this was the first demonstration

of mortality in any growing population of microbes. There is now a rapidly growing field studying the genetics of aging, and in recent discoveries that stagger the imagination, it is clear that Mortimer's work on yeast aging set the stage for the discovery of the first genes affecting aging, and whose function is conserved from yeast to metazoans.

Mortimer played yet another huge role in developing the field of yeast genetics by creating the *Saccharomyces* stock center, which housed the many thousands of strains of yeast that his group created, and strains that they obtained from others that he thought would be of interest to the community. Any investigator could browse the catalog and request any strain and receive it promptly for nothing more than the cost of a stamp. This generous service did much to create a culture of sharing which still blesses the yeast genetic community to this day. Indeed, in 2002 Mortimer received the "George W. Beadle Award" from the Genetics Society of America in recognition of his many contributions that created the community of approximately 10,000 researchers who daily turn their attention to uncovering more of the secrets of *Saccharomyces*.

Following his official retirement from UC, Mortimer spent 10 years in affiliation with the University of Florence, where he researched the genetic properties of yeast strains used in wine production. It seems perfectly fitting that at some point in the future we will be able to drink a toast to Mortimer with wine that benefited from his insights into the biology of yeast.

Mortimer is survived by his wife Mary, sons Douglas and Bruce, daughter Barbara, and three grandchildren. In addition to his family and science, Mortimer's other interests included fly fishing, mushroom hunting, hiking and gardening.

Reprinted from http://mcb.berkeley.edu/news-and-events/research-news/robert-mortimer/

Professor Samuel P. Meyers (1925-2007)

Samuel P. Meyers of Baton Rouge passed away at home on Friday, Nov 2, 2007. He was 82. Dr. Meyers was a world-renowned and much-admired professor at LSU in the departments of Food Science and Marine Science. He retired from LSU in 1997 as professor emeritus. Before joining LSU in 1968, Dr. Meyers was associate professor at the University of Miami, Marine Institute. Dr. Meyers' research and teaching activities covered a broad range of subjects including marine microbiology, food science and aquaculture. He had more than 200 publications in these areas. He has been recognized internationally as a pioneer in marine microbiology, and served as editor of the Aquatic Microbiology newsletter for 40 years. As a consultant to the Food and Aquaculture Division of the United Nations in the field of shrimp and fish aquaculture, Dr. Meyers traveled extensively worldwide, giving lectures and consulting and collaborating with colleagues. During his long career he mentored numerous graduate students from many countries and continued to encourage them throughout their careers. His numerous awards have included the LSU Phi Kappa Phi Research Award, the Dedicated Service Award from the World Aquaculture Society, as well as its Exemplary Service Award. Other recognitions from LSU include the Distinguished Research Master award and the Lipsey Professional Educators Award for outstanding contributions in teaching and professional achievement. In 1985, Dr. Meyers received the first U.S. patent awarded to LSU for a method of using shellfish waste, leading to development of economically valuable seafood byproducts.

Apart from his professional work, Dr. Meyers has authored more than 350 poems describing his life experiences and relationships with family, friends and pets. His wit and humor brightened the lives of all those who crossed his path. He was an active member of the Unitarian Church of Baton Rouge, serving in various leadership capacities over the years. Dr. Meyers is survived by his wife of 55 years, Gertrude (Trudi); daughter, Susan; sons, Stephen, Benjamin and David; sister, Dorothy; brother, Michael; brother-in-law, Al Knopp; many loving nephews, nieces and cousins; and his dear friend, Barbara Brandon. His family extends warm appreciation to Paulette Merge and Pam Arceneaux for their loving and compassionate care in the final weeks of his life. A memorial service to celebrate the life of Samuel Meyers will be held at the Unitarian Church of Baton Rouge on Friday, Nov. 30, at 7 p.m. In lieu of flowers, donations may be made to the Unitarian Church of Baton Rouge (specify Sam Meyers Memorial), 8470 Goodwood Blvd., or to the National Parkinson Foundation at http://www. parkinson.org.

Reprinted from The Advocate, Baton Rouge, Louisiana, USA.

International Commission on Yeasts (ICY)
A Commission of the Mycology Division of IUMS
Meeting of Commissioners, June 5th, 2007, ISSY 26, Sorrento, Italy

Minutes of Meeting

Present: Leda C. Mendonça-Hagler (Chair), Graham Fleet (IUMS-Mycology), Patrizia Romano, Lisa Granchi, Kyria Bound-Mills, Charoen Charoenchai, Hans van Dijken, Mojens Jakobsen, Lodewyk Kock, Matti Korhola, Patricia Lappe, Maria C. Loureiro-Dias, Ana Maráz, Sally Meyer, Gennadi Naumov, James du Preez, Bernard Prior, Amparo Querol, Peter Raspor, Doris Rauhut, Andrei Sibirny, Hana Sychrova, Johan Thevelein, K. Lopandic (invited).

Apologies: L. Scheffers, M. Bolotin-Fukuhara, P. Biely, M. Breitenbach, T. Deak, J. Douglas, B. Hahn-Hägerdal, C. Kurtzman, A. Lachance, A. Martini, A. Vaughan-Martini, M. Penttilä, J. M. Peinado, I. Pretorius, H. Prillinger, I. Spencer-Martins, G. Stewart, J. Stenderup.

Report from the Chair: Leda C. Mendonça-Hagler welcomed the delegates to the meeting and gave apologies for those who could not attend. She expressed her appreciation to Prof. Patrizia Romano and the Italian group for the excellent organization of ISSY 26 and their support to the Commissioners meeting. She presented the agenda and requested the inclusion of any additional item.

New Commissioners: Dr. Lene Jespersen (Denmark) and Dr. Teun Boekout (The Netherlands) were proposed by their respective countries. They were nominated with a warm welcome from the commissioners. Prof. Mojens Jakobsen was nominated an honorary member, continuing his participation as member of the Danish delegation.

Retired member: Dr. Maudy Smith, representing The Netherlands.

Minutes of the previous meeting: L. Mendonça-Hagler reported on the ICY meeting which took place during ISSY 25, on June 20th, 2006, at Hanasaari, Espoo, Finland. The minutes, for this last meeting, was sent by electronic mail to ICY commissioners.

Reports on Meetings

ISSY 25 (2006) – June, 18-21th – Hanasaari, Espoo, Finland: Systems Biology of Yeasts –from Models to Applications. This meeting was organized by Prof. M. Penttilä. Dr. Matti Korhola reported on ISSY 25, which was attended by some 240 delegates and 40 speakers. The attendance of substantial proportion of young investigators was reported. On behalf of ICY, L. Mendonça-Hagler expressed her gratitude to ISSY 25 organizers for the successful meeting, mentioning its high scientific level and pleasant visit to Finland.

ISSY 26 (2007) - June. 3-7th, Sorrento, (Naples) Italy – From alcoholic beverages to bioethanol: a new challenge for fermenting yeast. Website: http://www.issy26.org. Prof. Patrizia Romano was the coordinator of this Symposium, held at the elegant Hotel Vesuvio, with a breathtaking sea view. The symposium focused on the central role of *Saccharomyces cerevisiae* in the production of bioethanol for transportation and update actual knowledge on its use as starter in the alcoholic beverages industry. Prof. Romano reported on the ongoing ISSY 26 activities mentioning the attendance by some 200 delegates, including over 50 speakers. The Program main topics were: bioethanol by yeast fermentation, brewing yeasts, wine yeasts, yeasts in fermented beverages and genetic improvement of fermenting yeasts. On behalf of ICY, L. Mendonça-Hagler expressed her gratitude to the organizers for their efforts. She commented on the good choice of venue mentioning the historical sites and special gastronomy. She proposed a toast to Prof. P. Romano and her team, for the excellent work done to realize this memorable symposium. A special issue of FEMS Yeast Research, with papers presented at ISSY 26, will be published later. Pictures from ISSY 26 were kindly made available by the organizers at the meeting website.

ICY 2008 – 12th International Congress on Yeasts-Yeasts for Human Progress, August 11-15th Kiev, Ukraine. Coordinator: Prof. A. Sibirny - www.ICY2008.org.ua. A progress report regarding ICY 2008 was presented by A. Sibirny. He distributed a poster for the meeting and announced its webpage. A preliminary program was presented, including a comprehensive list of topics on yeasts, such as systematics, ecology, food and beverages, human diseases, system biology, metabolic engineering, fuel ethanol production, genomics, proteomics, cell cycle, transcription and translational regulation, sensing and signaling, membrane structure and functions, traffic and secretion, stress response, apoptosis, organelles and autophagy. He invited distinguished speakers, including Nobel Laureates to participate on ICY 2008. He also mentioned figures on costs and ongoing contacts with sponsors. The subject was discussed by the commissioners and several suggestions were addressed to Prof. Sibirny. L. Mendonça-Hagler thanked Dr. Sibirny for his intensive efforts regarding the organization of ICY 2008. He also announced ICY 2008 with a presentation done during ISSY 26 closing ceremony and invited the audience to visit Kiev next year.

ISSY 27 (2009) - France – Prof. M. Bolotin-Fukuhara is the coordinator of ISSY 27 in France. During the meeting in Espoo (2006), Prof. Bolotin-Fukuhara mentioned the organizers decision to dedicate this symposium to the memory of Louis Pasteur. She sent her apologies for not being able to attend the meeting in Italy and reported that the preparations for the symposium in France are progressing well.

ISSY 28 (2010) – Thailand - Dr. C. Charoenchai´s proposal to organize ISSY 28 was accepted by the Commissioners during the meeting at Oropesa del Mar, Spain. Dr. Choroenchai gave a progress report on the meeting and distributed folders with information on Thailand, and

announced Bangkok as the probable venue for ISSY 28.

Report on IUMS - Prof Graham Fleet, Chair of the Mycology Division of IUMS, reported on his activities. He mentioned that ICY was recognized by IUMS as one of the more active COMCOFs. ICY commissioners expressed their appreciation to Prof. Fleet for his active representation at IUMS. He reported on the ongoing preparations for IUMS 2008, to be held 4th-15h of August, in Istambul, Turkey (**http://www.iums2008.org**). A considerable increase in participation by the yeast scientific community is expected at IUMS 2008. Prof. Fleet's efforts were highly appreciated by the commissioners present at ICY meeting.

Proposals for future meetings: Discussion of future meetings took place. Prof. Peter Raspor made an informal proposal in favor of Slovenia. Prof. A. Sibirny mentioned the strength of USA yeast research. He suggested to the USA delegation to consider a proposal to host a meeting in the near future.

Report on YNL: L. Mendonça-Hagler mentioned the dedication of Prof. André Lachance in managing the **Yeast Newsletter**. She took the opportunity to encourage the commissioners to send reports, list of publications and abstracts on their research groups to YNL and to visit the home page:
http://publish.uwo.ca/~lachance/YeastNewsletter.html

Other business and activities: No further topics were included in the agenda.

Meeting Close: L. Mendonça-Hagler closed the meeting, congratulating the ISSY 26 organizing committees. She expressed thanks P. Romano, L. Granchi, A. Martini, and the Italian team for their dedication and for hosting this ICY meeting, completed with the delights of the Italian cuisine. All present expressed their appreciation regarding the symposium and the cultural experiences at Naples area.

Communicated by Leda C. Mendonça-Hagler

Forthcoming Meetings

9th European Conference on Fungal Genetics (ECFG9) Edinburgh, 5-8 April 2008

On behalf of the Organising Committee, we invite you to Edinburgh to join us and participate in ECFG9. ECFG has been held every two years in a different European city since the inaugural meeting in Nottingham in 1992. It now returns to the UK and will be held in Scotland's historic capital city. The first announcement can be found at **http://www.ecfg.info/** and we hope you will take the opportunity to register your interest in attending the conference. Please also revisit the web-site as it develops to include information on the scientific programme, registration, accommodation, social programmes and links to satellite meetings.

We look forward to seeing you in Edinburgh.

David Archer

Chair of the Organising Committee, ECFG9

John Peberdy

36th Annual Conference on Yeasts - Smolenice, Slovakia, May 14th-16th 2008

On-line registration is still open at **http://www.chem.sk/yeast** in December 2007. Main topics: 1. Genetics and molecular biology (coordinators: J. Nosek and H. Sychrová); 2. Cell biology and biochemistry (coordinators: I. Hapala and A. Pichová); 3. Biotechnology and biocatalysis (coordinators: M. Čertík and I. Márová). The deadline for registration and accommodation reservations is March 15th 2008. For Abstract submission the deadline is March 31st 2008.

12th International Congress on Yeasts, Kyiv, Ukraine, August 11-15, 2008

I am pleased to inform that, according to the decision of the International Commission on Yeasts, adopted at 11th International Congress on Yeasts (Rio-de-Janeiro, Brazil, August 2004), the 12th International Congress on Yeasts will be held in 2008 in Kyiv (Kiev), the capital of Ukraine. At the moment, the Local Organizing Committee, the Secretariat and the International Scientific Committee have been established. The Congress venues will be the Kyiv National Convention Centre and the Kyiv National University. The dates of the Congress are fixed for August 11-15, just after finishing the IUMS 2008, Istanbul, Turkey, i.e. after 12th International Congress of Bacteriology and Applied Microbiology and 12th International Congress of Mycology. In such a way, people attending IUMS in Istanbul could participate also in our Congress in Kyiv, which is especially convenient for people outside of Europe. Total number of participants will be limited to 500. The regular registration fee will be EUR 400 and the student registration fee will be EUR 350. The fee will include the bag with abstract and program, get-together party, 4 lunches, coffee breaks, Kyiv city tour and the opening concert. Organizers plan to collect sponsor money which will be used in part to promote participation of the students from developing countries.

Recently, the organizers have posted the web page of the Congress (see: **www.icy2008.org.ua**). Besides, the preliminary scientific program of the Congress is available. The list of the oral and poster sessions is as follows:

1. Yeast Systematics and Ecology
2. Food and Beverage Yeasts
3. Medically Important Yeasts
4. New Tools in Yeast Research
5. Systems Biology
6. Genomics and Proteomics
7. Transcriptional and Translational Regulation
8. Cell Cycle
9. Sensing and Signaling
10. Membrane Structure and Functions
11. Traffic and Secretion
12. Autophagy and Stress Response
13. Organelles
14. Yeast as Model of Human Diseases and Drug Testing
15. Production of Heterologous Proteins
16. Metabolic Engineering
17. Yeasts for Fuel Ethanol Production and other Biorefineries
18. Yeast Biochemical Engineering

All correspondence and inquiries should be sent to:

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Drahomanov Street
14/16, Lviv 79005
Ukraine

or to:

Dr. Andriy Y. Voronovsky (same address)

Phone: 380 322 740363
FAX: 380 322 721648.

The most convenient is to send inquiries to the special e-mail address
<icy2008@cellbiol.lviv.ua>

Glutathione and related thiols in microorganisms
Nancy, France, August 27-29 2008

A symposium concerning the multiple facets of Glutathione and related thiols in microorganisms will be held in Nancy (France) in August 2008 (27-29). The research effort on microbial thiols, in particular (but not only) glutathione, increased in the last ten years, in part because thiols were identified as important components of cell defence against oxidative, metals, xenobiotics, nutritional, osmotic, acid, etc. stresses, but also because these derivatives are now recognized as involved in signal transduction mechanisms. Thiols were also identified as playing major roles in cell cycle, from differentiation to apoptosis, and cell organisation as exemplified by aggregation, biofilm formation and also in interaction between microorganisms and plants. Moreover, glutathione is of interest for applications in food, pharmaceutical, cosmetic industry and environmental technology, especially waste water treatment. Different investigation fields will be thus covered in the planned symposium. We think that so it will be a nice opportunity to create a platform for exchanging ideas, and assembling investigators coming from different horizons. The three day meeting will include invited plenary lectures, oral communications and poster sessions. Arrangement will be taken with a scientific editor to publish communications in an international peer-reviewed journal.

In the last ten years, research effort on microbial thiols, in particular (but not only) glutathione, increased strongly. This was because thiols were identified as important components of cell defence against oxidative, metals, xenobiotics, nutritional, osmotic, acid, etc... stresses, but also considering that these derivatives are now recognized as involved in signal transduction mechanisms. Thiols were also identified as playing major roles in cell cycle, from differentiation to apoptosis, and cell organisation as exemplified by aggregation, biofilm formation and also in interaction between microorganisms and plants. Microorganisms, in particular yeast, are also considered as useful eukaryotic cell models, for example in studies on the oxidative stress and signal transduction mechanisms. Moreover, glutathione is of interest for applications in food, pharmaceutical, cosmetic industry and environmental technology, especially waste water treatment. Different investigation fields will be thus covered in the planned symposium. We think that so it will be a nice opportunity to create a platform for exchanging ideas, and assembling investigators coming from different horizons.

The organizing and scientific committee has already planned a programme in order to cover all the considered items. Full informations concerning the symposium and registration, abstract submission are available on the following web site: **http://www.thiolmicrob.uhp-nancy.fr**.

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Brief News Item

Saccharomyces Genome Resequencing Project

The first stage of the Saccharomyces Genome Resequencing Project (**http://www.sanger.ac.uk/Teams/Team71/durbin/sgrp/**) is nearly finished and we plan on submitting an overview manuscript in January. We hope that others will respect our priority in publishing the primary global analyses as outlined below, but also that people will use our data for additional analyses either to be published at the same time or after. Thank you all for your patience.

Publication plans:

Timeline: Draft in mid November, additions/corrections in mid December, submission in early January. We are planning on submitting to Nature.

Analyses included:

Sequence assemblies and comparisons
- *S. paradoxus* reference assembly
- Alignment of S. cerevisiae and *S. paradoxus* references
- SNPs and INDELs
- Copy number variation
- Potentially functional variation – pseudogenes etc.

Sequences not in Reference (yeast, fungal, other)

Population structures of *S. paradoxus* and *S. cerevisiae*
- *S. paradoxus* has strong population structure
- *S. cerevisiae* may be combination of 'clean' lineages and mosaic mixtures of these

Global search for evidence of selection
- Distribution of selection measures on genes
- Selection on branch sites and CAI for strongly expressed genes

Mosaic genomes and introgressions

Lab strain comparisons
- (W303, SK1, Y55 all >3X by ABI and 8-12X by Solexa)
- S288c (original gal2 etc. from stock) compared to SGD reference

Global phenotype analysis and comparison to phylogeny
- General correlations
- Specific pathways

Evidence of human influence and what the influence might be
- What does domestication mean?
  - Did human selection occur or did human activity select from available variation?
  - Are there feral *S. cerevisiae*?
  - Are there wild *S. cerevisiae*?

Future plans:

Other analyses known to be done or being done:
- rDNA analysis – copy number variation and mosaicism
- tRNA and other small structural RNAs
- Transposable elements
- Sequence assembly/imputation
- LD structure and recombination maps

Analyses that should be done sometime (not exhaustive)
- Assemble subtelomeric regions
- Regional variation in divergence/diversity

Invitations:

If anyone has done or plans on doing a global analysis with a tight clean result which you think should be included in the overview paper, please contact us and and we will consider its inclusion with associated authorship on the paper. The analysis would have to be complete by 14 December and you would have to be willing to have the details transparently displayed on the web pages associated with the project.

In addition to or alternatively, you may have an analysis you want to independently submit, either back to back or in another journal. We have already been approached by some journals concerning related papers and we would be happy to try to facilitate the submission of your work to one of these journals to coincide with the overview paper.

Communicated by Ed Louis, Institute of Genetics, University of Nottingham <ed.louis@nottingham.ac.uk>, and Richard Durbin, The Wellcome Trust Sanger Institute <rd@sanger.ac.uk>.

Yeasts in the News

Mite not right — in prison

Reid Sexton - October 14, 2007

VEGEMITE is off the menu for Victoria's 4200 prisoners because of fears they could use Australia's favourite breakfast spread to make booze. Authorities have cracked down on the dark spread because prisoners have discovered ways to refine Vegemite, which has a high yeast content, to brew alcohol. Authorities first cracked down on the breakfast spread in the late '90s, but there are concerns that home brew is still being made inside prisons, particularly in the lead-up to Christmas.

The Department of Justice said Vegemite was banned because prisoners have been known to extract the yeast. The extraction process involves melting Vegemite and using the yeast to ferment sugar or carbohydrates into alcohol. Last year, several prisoners were found severely drunk at the Metropolitan Remand Centre. They had secretly fermented fruit, believed to be stolen from the prison's kitchen, and turned it into alcohol. Brimbank Legal Centre spokesman Charandev Singh said the only times prisoner advocates came in contact with the Vegemite issue was after alcohol-related deaths in custody. "Anything in prison can be turned into alcohol. Fruit, sugar, bread. The issue for us is not banning Vegemite. It's about basic safety."

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http://www.theage.com.au/articles/2007/10/13/1191696241416.html