newsnotes

Children's Diabetes Foundation at Denver **Summer 1997**

1997 RESEARCH EDITION

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THE RESEARCH PROGRAM

— John Hutton, Ph.D., Research Director

The Barbara Davis Center has the status of an internationally renowned scientific research organization with particular expertise in the area of immunology of diabetes. Many fellows who have trained with Center staff now hold leading clinical and search posts all over the world,

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including Australia (Peter Colman, Charles Verge), the United Kingdom (Kevin Docherty), Israel (Pnina Vardi), Germany (Anette Ziegler), and Japan (Hiroshi Ikegami). These former fellows continue their association through collaborative interdisciplinary research programs and have provided a steady flow of new post-doctoral fellows to the Center. These alumni have also created unique opportunities for research, as exemplified by a study of diabetes susceptibility genes in a large Bedouin Arab family in Israel. The Center also trains graduate students within the University of Colorado in the departments of Pediatrics, Endocrinology, Immunology and Cell and Structural Biology.

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George S. Eisenbarth, M.D.,Ph.D., Executive Director

The susceptibility to develop type I diabetes is strongly heritable and is controlled by a number of genes, the majority of which have not been identified. Studies are currently concentrating on four groups: identical twins of patients with type I diabetes, a population-based Colorado cohort of young, at-risk individuals, a family with a genetic defect that alters the production of insulin from proinsulin, and other unique families with multiple generations affected by type I diabetes. Investigations here aim to locate the genetic mutations that account for the disease association which will ultimately contribute to our ability to identify at-risk individuals.

H. Peter Chase, M.D., Clinical Director

The onset of type I diabetes is preceded by a long period without symptoms when progressive autoimmune destruction of the pancreatic B-cell occurs. New autoantibody tests developed at the Center are helping to determine who is susceptible to the disease so that therapy might be instituted before the disease develops. This has set the stage for trials for the prevention of the disease, and a series of studies evaluating various modes of insulin administration is being conducted on 60,000 people as part of the DPT-1 National Diabetes Prevention Trial. The Center has recruited a large proportion of the individuals entering the trial and performs key genetic and autoantibody assays for it.

The Center remains at the forefront of research aimed at identifying the immune cells (T lymphocytes) responsible for the pathogenesis of the disease. The major thrust of this work comes from investigations with the NOD (non-obese diabetic) mouse, an experimental animal which serves as an excellent model of the disease in humans. The nature of the T cells and their molecular targets are being identified in order to develop new strategies for an effective vaccine against the disease which will hopefully translate into clinical trials in the near future.

The treatment of type I diabetes by transplantation from cadaveric donors is a practical procedure, though at the moment it is usually restricted to individuals who need a kidney because of life-threatening diabetic kidney disease. For young patients, the medical problems introduced by immunosuppressive drugs outweigh the benefits that would be gained. A major goal of the work of the Center's Transplant Immunobiology Division is the achievement of islet transplantation using minimal recipient immunosuppression. This is now feasible in non-diabetic mice and even in the autoimmune NOD mouse by a number of novel strategies. In conjunction with the Department of Surgery at the University of Colorado, we aim to translate this knowledge into clinical practice.

Successful islet transplantation requires an abundant supply of islet tissue from a source other than human cadavers, but what source? Graft tissue from animals whose organs have been genetically manipulated to make them acceptable for transplantation into the human body is one potential avenue. Another possibility is to genetically engineer cultured insulin producing cells for implantation. A third is to recreate in the adult the normal process whereby the islets are generated in fetal life. Each of these approaches is being investigated by Center personnel in collaboration with University bio-engineering groups and developmental biologists. The group shares the belief that such interdisciplinary research will achieve an effective treatment for type I diabetes that is safe and available to all.

RESEARCH UPDATES: BDC LABORATORIES

George S. Eisenbarth, M.D., Ph.D. Executive Director

One ultimate goal for the prevention of childhood diabetes is the development of immunologic vaccines which have the potential with a single administration to prevent the autoimmunity which leads to diabetes. During the past year, vaccine trials in diabetes prone mice and clinical genetic and immunologic studies have advanced to a stage where we can now design initial vaccination trials. In particular, it is now apparent that as many as one in two relatives of patients with type I diabetes, who express high risk genes on chromosome 6, will develop anti-islet autoimmunity by two years of age. Often such anti-islet autoantibodies appear in the first year of life. Expression of a combination of more than one of these antibodies indicates a risk of diabetes of more than 90%. Such high risk children are most likely to benefit from future vaccination trials.

In a unique Bedouin Arab family from Israel with 18 members with type I diabetes, we have (in collaboration with Dr. Pnina Vardi of Israel) identified a region on chromosome 10 which, in concert with the above genes on chromosome 6, gives a risk of diabetes of almost 30%. Members of this family have other genetic autoimmune diseases, including celiac disease and thyroid autoimmunity.

Approximately one in ten children and young adults with diabetes have the intestinal disorder celiac disease, or the adrenal disease Addison's disease. Both of these disorders are often not diagnosed prior to permanent harm and both are relatively easy to treat. We currently screen all of our patients for autoantibodies predicting these diseases. (See the BDC Web page - **http://www.uchsc.edu/misc/diabetes/bdc.html**)

Given the appearance of anti-islet autoantibodies in the first years of life, the search is underway to identify therapies to prevent diabetes. We carried out pilot studies and are now contributing to the large national DPT-1 trial for diabetes prevention which is studying low dose subcutaneous and oral insulin. In animal models, a small piece of the insulin molecule (amino acids 9 to 23 of the B chain) can be used as a vaccine to prevent diabetes. The white blood cells which recognize this piece of insulin are directed to islets (see Wegmann, et al) and these T cells are unusual in sharing in common a segment of their T cell receptor.

To develop trials of diabetes prevention in man by immunologic vaccination will require a staged approach. Initial studies will be in patients who have just developed diabetes and for whom the goal will be to prevent further destruction of the cells which produce insulin. Such trials will be followed by prevention trials for relatives with high risk autoantibodies, and these trials will be followed by trials in the relatives with high genetic risk who do not yet express antibodies. These are the children described in the first paragraph with a one in two risk of activating autoimmunity early in life. Finally, if the vaccines prove safe and effective, it may be possible to "simply" vaccinate large populations to prevent diabetes.

John C. Hutton, Ph.D. Research Director

The area of pancreatic islet molecular and cellular biology has seen some remarkable developments in the past two years with the discovery of genes which are critical to the growth and differentiation of the islet. Manipulation of these genes holds promise in the future for the regeneration of islets from a diseased pancreas or the production of insulin by cells other than those derived from the pancreas. One of our collaborators at the University of Colorado has, for example, identified NeuroD, a gene transcription factor which when deleted results in diabetes due to a failure of fetal insulin-producing cells to form islets. We have identified another genetic defect associated with diabetes in the enzyme PC1 which is responsible for the conversion of proinsulin to insulin. These results came from a detailed analysis of a single individual in whom gestational diabetes was accompanied by a reproductive disorder and childhood diabetes.

Our ongoing search for new diagnostic markers for preclinical type I diabetes has recently revealed four new candidate autoantigens to which autoantibodies are present in new onset patients. These proteins appear to be components of the insulin secretory granule membrane. Future investigations are aimed at molecular characterizations of these autoantigens, refinement of the assays for measuring autoantibodies to them in patients and evaluation of their importance to the pathogenesis of diabetes using the NOD mouse model.

Ron Gill, Ph.D.

Nature of islet allograft immunity and tolerance: These studies deal with the mechanisms by which transplanted islets are destroyed by one set of immune system cells (CD8 T cells) and the role of another set (CD4 T cells) in facilitating the destruction. In parallel, a major emphasis is on the study of the induction of tolerance to transplanted islets. The hypothesis being explored is that tolerance to islet transplants is controlled by regulatory molecules (cytokines) produced by immune cells.

Nature of islet xenografting immunity: This area of research focuses on the nature of T cell immunity to islets transplanted from other species (xenografts) with particular emphasis on comparing this process with the response to islets from the same species (allografts). These studies have indicated that xenograft and allograft immunity are quite different processes in that allograft responses appear to depend particularly on CD8 T cells, whereas the xenograft response is more dependent on CD4 T cells. One implication of this research is that it could ultimately enable us to use islets from other species as a treatment for human diabetes and thus solve the problem of finding adequate numbers of islets to treat all patients with this disease.

Nature of islet damage in autoimmune diabetes: These studies address the mechanism of islet damage initiated by autoimmune T cells derived from non-obese diabetic (NOD) mice. In collaboration with Dale Wegmann, Ph.D., the mechanism of islet damage triggered by T cells that react against insulin is being examined. Such cells make up a large proportion of the T cells found in the pancreatic islets of NOD mice and can trigger islet destruction regardless of the donor source of the islets. This in turn suggests that the mechanism of damage in this system appears to be very similar to the type of damage proposed for islet xenograft destruction. We will continue to examine the mechanisms by which autoimmune T cells actually recognize and destroy islet transplants.

Anthony Hayward, M.D., Ph.D.

Work in this laboratory has recently focused on the consequences to non-immune cells of CD40-CD40L interactions. We are testing the hypotheses that islet cell destruction is mediated through CD40 and that immunity to certain intracellular pathogens (CMV and cryptosporidia) is similarly mediated. These studies use mice with mutated genes for CD40, CD40L and Bax and have required the development of new collaborations with Drs. Flavell, Korsmeyer and Kikutani. Recent progress includes the finding that CD40L knockout mice do not eradicate cryptosporidia from their biliary tree. We have an *in vitro* model system using HepG2 cells, which undergo apoptosis when their surface CD40 is ligated, while protein synthesis (specifically, Bcl-2 and Bcl-x) is inhibited.

One extension of these findings has involved apoptosis in islet cells triggered by CD40 ligation. Protein synthesis, and again Bcl-2 and Bcl-x, can protect the islet cell lines from CD40L-triggered apoptosis. Our long-term aim will be to see if apoptosis-deficient islets can survive in NOD mice. To this end, we tried to breed Bax knockouts for Dr. Gill to transplant their islets into NOD recipients.

The lab is also pursuing the induction of transplantation tolerance in human fetuses by injection of bone marrow stem cells. The diseases selected for treatment are homozygous thalassemia syndromes (a and b) and lysosomal storage disorders. The end point for study is the development of chimerism and/or abolition of conventional CMI responses such as alloantigen-specific T cell proliferation and cytotoxicity. Additional studies to understand when the human T cell repertoire diversifies are in progress, using PCR to identify TCR messages in human fetal lymphocytes.

Studies are also in progress on immune responses to infectious organisms, specifically respiratory syncytial virus, varicella zoster virus and BCG. The latter is in the context of a clinical trial to delay progression of islet cell destruction in new onset type I diabetics.

Kathryn Haskins, Ph.D.

The major thrust of our research continues to be directed toward the understanding of mechanisms of pathogenesis and regulation of autoimmune diabetes in the NOD mouse. Our tools for this research are a panel of islet-specific diabetogenic T cell clones and several NOD strain variations, including the diabetes-resistant NOD strain, diabetes-resistant NOD congenics, the NOD-*scid*, and a TCR transgenic mouse on the NOD background. One important project is to isolate and identify the beta cell antigen(s) for the pathogenic T cell clones we have produced. A second project is the comprehensive analysis of requirements for disease induc-

tion by T cell clones and how to inhibit this process. A third project is to investigate regulatory mechanisms through comparative analysis of cytokine production, costimulatory molecule function, and antigen presentation in the diabetes-prone NOD and related diabetes-resistant strains.

Our major achievements during the past year include (1) demonstration of an antigen-presenting cell functional defect in the NOD and localizing this deficiency to splenic macrophages; (2) determining differences in cytokine profiles between NOD mice and diabetes-resistant strains; and (3) isolation of islet-reactive lines and clones with a Th2 phenotype as shown by *in vitro* cytokine production. Our directions in the coming year will be to further characterize the regulatory defects in antigen presentation and cytokine production in NOD mice and to investigate the *in vivo* activity of the Th2 clones. We are also endeavoring through a collaborative effort to produce a second TCR transgenic mouse and hope to begin characterization of this animal.

Dale Wegmann, Ph.D.

It is now clear that human insulin dependent diabetes mellitus (IDDM) is the result of an autoimmune disorder in which a particular type of white blood cell, a T lymphocyte or T cell, attacks and destroys the insulin producing beta cells of the pancreas. There is also an inbred mouse strain, the nonobese diabetic (NOD) mouse, that develops insulin dependent diabetes as a result of T cell attack on beta cells. Our laboratory has spent the last several years investigating the T cell response of NOD mice to beta cells and have found that insulin is one of the proteins recognized by autoimmune T cells. In a subsequent analysis, we found that a small fragment of the insulin molecule (B:9-23) is the part that is actually recognized by the great majority of T cells that recognize insulin. More importantly, we have found that this fragment will protect NOD mice from diabetes. We are in the process of determining if this fragment of insulin is recognized by T cells from human subjects who either have IDDM or are classified as at risk in screening assays. Other experiments are aimed at determining the mechanism by which B:9-23 confers protection.

The major research efforts of my laboratory over the past several years have been directed toward characterization of the T cell response to islets in NOD mice in several different situations: first, as it is reflected in the islet infiltrates that accumulate during the spontaneous disease process; second, in the infiltrates that develop and rapidly destroy islet isografts placed in spontaneously diabetic mice and referred to as “disease recurrence;” third, as it develops in the draining lymph nodes of animals protected from IDDM by intranasal or subcutaneous B:9-23; and fourth, the nature of the changes within islet infiltrates of mice that have been protected from diabetes by B:9-23 or other treatments. The overall goals of these investigations are to understand the development of the immune response to islets during the disease process in detail, and to understand what alterations are induced in this response by antigen-specific therapies that result in protection of NOD mice from diabetes. In addition to the mouse work, we have been attempting to isolate and characterize T cell clones and lines from new onset or prediabetic individuals that might have some relevance to the disease process. This work has been progressing and we have recently confirmed that B:9-23 is an epitope in at least DR4/4 individuals.

Don Bellgrau, Ph.D.

Immunobiology of type I diabetes: Our overall working hypothesis at present is that defective T cell function is involved in disease. A major focus of our laboratory research is the study of candidate autoreactive T cells that are unusually resistant to regulation. Our goal is to determine the function of diabetogenic genes.

Immunology of privileged sites: The work on the immunobiology of type I diabetes has provided us with important insights into the special characteristics of autoreactive T cells and provides an experimental means to explore the issues of transplantation tolerance, transplantation rejection and the immunobiology of privileged sites. Central to this issue is our finding that immune privilege in the testis requires the production by the testis tissue of CD95 ligand. Our goal is to determine if CD95 expression by testis tissue is not only necessary but sufficient to convey immune privilege to normally immunogenic tissue.

T cell signalling: In our studies of the BB rat and NOD mouse models of type I diabetes, we have discovered that autoreactive T cells may be defective in tyrosine kinase mediated T cell signalling. We hypothesize that these signalling defects influence the function of T cells that regulate autoreactive T cells. Our goal is to define these defects both biochemically and molecularly. This work should provide important insights into

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the nature of the defects in regulatory T cells and/or effector T cells involved in autoimmunity.

Autoimmunity: While the prevailing view at this time may be that autoimmune disorders are more different than alike, our own bias is that many different autoimmune disorders may have common pathways of initiation in that they share cells that cause the destruction of targeted tissue. This area is being pursued experimentally in our laboratory by comparing the cellular and molecular immunology of the diabetes-prone and diabetes-resistant BB rats to each other, as well as to the diabetes-prone NOD mouse and diabetic humans. This work is helping us define the "ground rules" that control autoimmunity. At this level it should be possible to design reagents that are effective on multiple autoimmune disorders.

CLINICAL RESEARCH

H. PETER CHASE, M.D.
Clinical Director

Diabetes Prevention Trial

Over the past year, the clinic has been very involved in the National Diabetes Prevention Trial (DPT-1). The Barbara Davis Center is one of 10 centers nationwide participating in this trial. H. Peter Chase M.D. and George S. Eisenbarth M.D., Ph.D. are serving on the nineteen-member steering committee for this trial.

Approximately 40,000 people have been screened, with over 8,000 screened at our Center. Approximately 160 people (with a greater than 50 percent risk of developing diabetes within five years) have been entered into the parenteral trial, with almost one-fourth of the total participants coming from our Center.

The second part of the trial (for people with a 35 to 50 percent risk for developing diabetes in the next five years) began in September, 1996. To date, our Center has admitted 18 of the first 69 subjects nationwide. This research is funded by NIH (National Institutes of Health) and has been the major focus of Dr. Peter Chase and Sherrie Harris, R.N., DPT-1 research nurse. The assistance of the NIH-funded Children's Clinical Research Center at The Children's Hospital in Denver has also been of great help.

Prevention of the Eye and Kidney Complications of Diabetes

Satish Garg, M.D. and Dr. Chase have published over 20 articles in this area and are continuing their longitudinal studies. In January, 1997, the first of three articles related to 24-hour ambulatory blood pressure monitoring (ABPM) was published in *The American Journal of Hypertension.* The article dealt with controls who were studied in order to obtain better normal data to compare with data from people with diabetes who came from different ethnic groups. Surprisingly, it was found that African-American teenagers already had some significantly higher blood pressure findings compared to age-matched Anglo or Hispanic youth. As it is known that adult African-Americans have a higher risk for hypertension, this study suggests that prevention of hypertension will need to start at a young age in this population.

Studies of 24-hour blood pressure monitoring and the eye complications of diabetes are now in press. Of the findings, elevated resting (sleeping) diastolic blood pressure was the finding most closely associated with both diabetic eye and kidney changes.

A longitudinal (three-year) follow-up of the eye and renal changes in people receiving the new insulin, Humalog® (insulin lispro), was reported by Drs. Garg and Chase at the national American Diabetes Association meeting (June, 1997) and at the International Congress of Diabetes (August, 1997). It was important to make sure that this new insulin analogue would not hasten the eye and kidney complications of diabetes. Fortunately, their findings do not show any evidence of this.

As reported elsewhere in this issue of *NEWSNOTES*, a new "double-blind" trial of the effects of antioxidants on the eye and kidney complications of diabetes has now begun. It is anticipated that this will be a three-year trial.

New Insulin Trials

The use of Humalog® (insulin lispro) in preschoolers one to four years old has been studied by Ms. Succhari Rutledge and by Dr. Chase and others at the Center. It was found that the new insulin was even more effective when given to preschoolers after the meal, in comparison to Regular insulin given up to 30 minutes before the meal. This will allow parents to judge the toddlers' insulin dose on what is eaten and will help to prevent eating problems related to an insulin dose having already been given, with the preschooler then refusing to eat.

SELECTED MEETINGS, GRANTS AND HONORS RECEIVED

RESEARCH DIVISION

GEORGE S. EISENBARTH, M.D., Ph.D. Executive Director

Selected meetings attended:

Invited speaker, First International SCMCI Symposium on Type I Diabetes, Tel Aviv, Israel, March, 1996.

Invited speaker, European Association for the Study of Diabetes Satellite Symposium, Vienna, Austria, September, 1996.

Co-organizer, American Diabetes Association 31st Research Symposium, Estes Park, CO, September, 1996.

Invited speaker, 75th Anniversary Discovery of Insulin, Toronto, Canada, October, 1996.

Grant Support:

Principal Investigator. NIH, Diabetes Prevention Trial, HLA laboratory subcontract, 11/1/93-8/31/98, annual direct costs $73,520.

Principal Investigator. NIH, Natural history of pre-diabetic autoimmunity, 7/1/93-6/30/97, annual direct costs $323,683.

Principal Investigator. NIH, Genetic and environmental causes of celiac disease, 10/1/95-9/30/00, annual direct costs $156,152.

Principal Investigator. NIH, Antibodies to recombinant autoantigens: prediction/immunogenetics, 12/1/95-11/30/00, annual direct costs $33,200.

Blum-Kovler Fellowship, 7/1/97-6/30/98, $30,000.

ADA mentor-based postdoctoral fellowship program grant, 7/1/95-6/30/98, annual direct costs $30,000.

Prizes, Awards, other Merits:

Francis D. W. Lukens Medal, Penn. Chapter American Diabetes Assoc., 1995.

Robert E. Bolinger Citation for Academic Distinction, Kansas School Med., 1996.

David Rumbaugh Award of the Juvenile Diabetes Foundation, Miami, Florida. The award was given jointly to Dr. Eisenbarth and Dr. Ali Naji. June 1997.

JOHN C. HUTTON, Ph.D. Research Director

Selected meetings attended:

Clore Laboratory 3rd International Symposium, Buckingham, UK, July, 1996.

Gordon Research Conferences, New Hampton, NH, July, 1996.

European Association for the Study of Diabetes 32nd Annual Meeting, Vienna, Austria, September, 1996.

Immunology of Diabetes Workshop, Canberra, Australia, December, 1996.

Keystone Symposium, Taos, NM, March, 1997.

Keystone Symposium, Keystone, CO, April, 1997.

International Diabetes Federation Satellite Meeting, Helsingor, Denmark, July, 1997.

Grant Support:

Principal Investigator. JDFI, Molecular screening for novel autoantigens in type I diabetes, 9/1/96-8/31/98, annual direct costs $50,000.

Principal Investigator. JDFI, Sorting of the prohormone convertase PC3 and proinsulinaemia, 9/1/96-8/31/98, annual direct costs $50,000.

Principal Investigator. University of Colorado Biomedical Engineering. Development of artificial pancreas for diabetic therapy, 7/15/96-7/14/97, $20,000.

ADA mentor-based postdoctoral fellowship program grant, 7/1/97-6/31/00, annual direct costs $30,000.

Principal Investigator. NIH, Cloning of the molecular targets of cell mediated autoimmunity in type I diabetes, 12/14/96-11/30/00, annual direct costs $138,274.

Principal Investigator. NIH, large equipment grant. Molecular Dynamics STORM 860 Imager, 4/1/97-3/31/98, $85,000.

Prizes, Awards, other Merits:

Appointed Professor of Cellular & Structural Biology, UCHSC, September, 1996.

RON GILL, Ph.D.

Selected meetings attended:

"T Lymphocyte-Dependent Pathogenesis in Islet Transplantation," University of Alberta, Department of Surgery. Edmonton, Alberta, Canada, March, 1997.

"Tolerance Does Not Require Clonal Deletion of Antigen-Specific T Cells," 15th Plenary Session, Immunology of Diabetes Workshop, Canberra, Australia, December, 1996.

"The Role of CD4 T Cells in Pancreatic Islet Transplantation Immunity," SmithKline Beecham Pharmaceuticals-sponsored Transplantation Symposium, Collegeville, PA, May, 1996.

"T Cell-Dependent Pathogenesis in Pancreatic Islet Transplantation," Alberta Heritage Foundation for Medical Research, University of Alberta, Edmonton, Canada, March, 1996.

"T Cell-Dependent Damage in Pancreatic Islet Transplants," University of Maryland Medical Center Transplantation Program, Baltimore, MD, February, 1996.

Grant Support:

Principal Investigator. NIH, Reversal of diabetes by islet transplantation, 4/1/94-3/31/98, annual direct costs $186,928.

Principal Investigator. NIH, Immunobiology of pancreatic islet xenografting, 1/1/93-12/31/97, annual direct costs $109,835.

Principal Investigator. JDFI, Protection from autoimmune-mediated islet injury through gene therapy, 9/1/95-8/31/97, annual direct costs $45,345.

Principal Investigator. Baxter Healthcare Corporation, Autoimmune triggering and regulation by immunoisolated islet antigens, 7/13/96-7/12/97, annual direct costs $19,073.

KATHRYN HASKINS, Ph.D.

Selected meetings attended:

Invited Speaker, Symposium on Autoimmunity in IDDM, Royal Society of Medicine, London, UK, April, 1996.

European Immunology Conference, Les Embiez, France, May, 1996.

Invited Speaker, IDDM Symposium, Copenhagen, Denmark, November, 1996.

Mini-symposium Chair, AAI Annual Meeting, San Francisco, CA, February, 1997.

Symposium Speaker, 16th International Diabetes Federation Congress, Helsinki, Finland, July, 1997.

Immunology Division, Cambridge University, Cambridge, England, April, 1996.

Pasteur Institute, Paris, France, June, 1996.

Erasmus University, Rotterdam, Netherlands, July, 1996

Joslin Diabetes Center, Boston, MA, March, 1997.

Grant Support:

JDFI Research, Autoreactive T cells in the NOD mouse, 9/1/95-8/31/96

Principal Investigator. JDFI, Role of Th2 T cells in immunoregulation of IDDM, 9/1/95-8/31/97, annual direct costs $50,000.

Principal Investigator. NIH, Training program in immunology, 8/1/96-7/31/01, annual direct costs $167,831.

Principal Investigator. NIH, Antigen specificity of T cell clones from the NOD mouse, 5/1/92-4/30/98, annual direct costs $196,698.

Principal Investigator. NIH, Autoreactive T cells in the NOD mouse, 9/1/96-8/31/00, annual direct costs $234,881.

ANTHONY HAYWARD, M.D., Ph.D.

Selected meetings attended:

Invited speaker, NIH Fetal Stem Cell Transplantation Meeting, Bethesda, MD, June, 1996.

Invited speaker, NIH Fetal Stem Cell Transplantation Meeting, Reno, NV, September, 1996.

Invited speaker, APS/SPR meeting, Washington, DC, June, 1996.

Visiting Professor, University of Florida, Gainesville, FL, February, 1996.

Grant Support:

Co-investigator. NIH, General clinical research centers program of NCRR, 12/1/95-11/30/00. $1,516,121.

Principal Investigator. NIH, Training program in pediatric immunology, 9/1/95-8/31/00, annual direct costs $62,422.

Principal Investigator. NIH, Fetal stem cell transplantation for alpha thalassemia, 6/1/96-5/31/97, annual direct costs $129,004.

Co-investigator. NIH, Natural and vaccine immunity to RSV in man and monkeys, 12/1/94-11/30/98, annual direct costs $209,000.

Principal Investigator. Colorado Cancer Campaign, CD40-CD40L interactions and susceptibility to hepatobiliary cancer, 7/96-6/98, annual direct costs $18,500.

DALE WEGMANN, Ph.D.

Selected meetings attended:

Invited speaker, Clinical Immunology Society Annual Meeting, New Orleans, LA, May, 1996.

Invited Co-chair, "Cytokines and Autoimmunity." American Association of Immunologists Annual Meeting, New Orleans, LA, June, 1996.

Invited speaker, "Who Killed the Beta Cell?," American Diabetes Association Annual Meeting, San Francisco, CA, June, 1996.

Invited speaker, "Protection of NOD Mice from Diabetes by Insulin B:9-23." European Association for the Study of Diabetes, Satellite Symposium, Vienna, Austria, August, 1996.

Invited speaker, "Insulin Immunomodulation Therapy," American Diabetes Association 31st Research Symposium, Prevention of Type I Diabetes in the General Population, Estes Park, CO, September, 1996.

Symposium Co-chair, "Autoantigens in IDDM," 15th Immunology of Diabetes Society, Canberra, Australia, December, 1996.

Grant Support:

Principal Investigator. NIH, Regulation of diabetes in the NOD mouse. $101.000, 5/1/96-4/30/97.

Principal Investigator. NIH, Analysis of the islet-specific T cell response in NOD mice 8/1/94-7/31/97, annual direct costs $125,988.

Principal Investigator. JDFI, Characterization of GAD-specific T cells from NOD mice, 9/1/95-8/31/97, annual direct costs $45,450.

DONALD BELLGRAU, Ph.D.

Selected meetings attended:

The Second International Conference on New Trends in Clinical and Experimental Immunology, Geneva, Switzerland, February, 1996.

European Federation Meeting on the Molecular Basis of Autoimmunity, Lengries, FRG, October, 1996.

The Third Gordon Conference on Neuroendocrine Immunology, Ventura, CA, January, 1997.

AAAAI/AAI/CIS Joint Meeting, Mini-symposium Chairman, "Mechanisms of Organ Specific Autoimmunity," San Francisco, CA, February, 1997.

Harvard Medical School Dept. of Immunology, "Immune Privilege and CD95 Ligand," Cambridge, MA, February, 1996.

Biotransplant Inc., "A Role for CD95 Ligand in Transplantation," Boston, MA, February, 1996.

The Second International Conference on New Trends in Clinical and Experimental Immunology, "Fas Ligand-Based Immunosuppression," Geneva, Switzerland, February, 1996.

Sandoz Pharmaceuticals, "Fas Ligand and the Immunology of Privileged Sites," Basel, Switzerland, February, 1996.

The Basel Institute for Immunology, "The Immunology of Privileged Sites," Basel, Switzerland, February, 1996.

Grant Support:

Principal Investigator. NIH, Autoreactive T cells resistant to tolerance induction, 12/1/94-11/30/98, annual direct costs $115,000.

Principal Investigator. JDFI, Fas ligand-based tolerance induction, 9/31/96-8/30/98, annual direct costs $45,000.

Principal Investigator. Colorado Institute for Research in Biotechnology. "CD95 Ligand: A Novel Immunosuppressive Agent to Create Artificial Immune Privileged Sites," 7/1/96-6/30/97, annual direct costs $35,000.

CLINICAL DIVISION

H. PETER CHASE, M.D.
Clinical Director

Selected meetings attended:

Diabetes Prevention Trial Steering Committee, Washington, DC, January and June, 1997.

American Diabetes Association, Boston, MA, June, 1997.

Course Director, Management of Diabetes in the 1990's, Vail, CO, August, 1996.

Thirty-first ADA Research Symposium, "Prevention of Type I Diabetes in the General Population," Estes Park, CO, September, 1996.

Central Plains Clinic Symposium, "Topics in Clinical Medicine," Sioux Falls, SD, April, 1997.

Grant Support:

Principal Investigator. NIH, National Diabetes Prevention Trial (DPT-1), 1994-2002, annual direct costs $200,000.

Principal Investigator. Becton-Dickenson pen needle study, 1997, $10,000.

Prizes, Awards and Other Merits:

University of Wisconsin, annual Medical School Alumni Award, Outstanding Alumnus, May, 1997.

American Association of University Women's "Trailblazer" Award for work as co-chairman of the four-state Commission on Poverty in Children. 1997.

President, Colorado Chapter of the American Diabetes Association. 1997.

GEORGEANNA KLINGENSMITH, M.D.
Director of Pediatric Clinics

Selected meetings attended:

Selected to present the ADA Council of Youth Symposium at the ADA meeting. Topic: "The Treatment of Non-type I Diabetes in Youth," 1997.

Presented a portion of the DAISY study research at the Fifth International Congress of the Juvenile Diabetes Foundation International. Topic: "The Psychosocial Impact of Diabetes Risk Identification," 1997.

Grant Support:

Principal Investigator. Genentech clinical research grant for ongoing clinical trial, 6/1/97, approximately $94,000.

Prizes, Awards and other Merits:

Selected to the American Board of Pediatrics, the sub-board of Pediatric Endocrinology, a national board of nine pediatric endocrinologists responsibile for preparation of the certification examination for all pediatric endocrinologists. 1997.

Chairperson of the National American Diabetes Association Council for Diabetes on Youth from 1994 to 1996.

PHILLIPE WALRAVENS, M.D.

Selected meetings attended:

Workshop on "Insulin Injection Techniques" sponsored by Becton Dickinson in France. June 7th and 8th, 1997.

Grant Support:

Principal Investigator. Grant from Bristol Meyers Squibb to study the effects of using Glucophage®, an oral hypoglycemic agent, in addition to insulin, in adolescents with type I diabetes, 10/97-12/98, $70,000.

Prizes, Awards and other Merits:

Appointed Professor of Pediatrics, UCHSC. 1997.

SELECTED RESEARCH PAPERS PUBLISHED OR IN PRESS

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NEW CLINICAL TRIAL OF ANTIOXIDANTS AND MICRONUTRIENTS

— H. Peter Chase, M.D.
Clinical Director

A new research trial at the Barbara Davis Center began in July 1997 to evaluate the possible role of antioxidants in preventing the eye and kidney complications of diabetes. Although high HbA_{1c} levels, elevated blood pressure and smoking are all known to be related to the microvascular complications of diabetes, other factors not yet identified may also be important. One possible explanation relates to the formation of advanced glycosylation end products (AGEs) which form from sugar attaching to body proteins as with the HbA_{1c} values, hemoglobin and glucose, formed when blood sugars are high. Although the HbA_{1c} values, and red blood cells, turn over every three months, the AGEs tend to remain in the body.

Oxidation is believed important in creating the AGEs and is also believed important in allowing the AGEs to form irreversible bonds (cross-links) between proteins. A recent article in *Diabetes Self-Management* (March/April 1997) noted: "There is preliminary research in animals that suggests antioxidants may help slow the progression of diabetic retinopathy." The Center has joined hands with a commercial company, LiForce International, Inc., to evaluate the role of antioxidants in diabetic eye and kidney disease. There is no evidence in humans at this time that these agents are beneficial.

One hundred subjects with type I diabetes will be asked to participate in the double-blind trial. All subjects will be asked to take four tablets twice daily. Half of the subjects will receive a tablet containing antioxidants, e.g.: vitamins A, C and E, and micro-nutrients, e.g.: zinc, magnesium, potassium, all of which are available "over-the-counter" and are not prescription medicines. The other half of the subjects will receive a placebo (inert) tablet, as this is how research must be done to determine if there is an effect. People taking various vitamins must discontinue them for 30 days prior to entering the trial. The Human Subjects Committee requires all trial participants to be told that, "There is no evidence that the present study will offer any benefits to you." This is a routine statement required for all research trials.

A unique aspect of this trial is that people with type I diabetes ages 14 to 50 years will be invited to participate. This means that in some cases teenagers as well as their parents may join the trial. Those who enter will receive the most modern and complete eye and kidney evaluations possible. The eye exams will include photographs using the new digital-imaging (TV) equipment at the Center. This allows retinal pictures to be looked at as they are taken and prevents the need to retake pictures a week later due to poor quality. The urine microalbumins will be done similarly with a new immunologic method that obtains results in seven minutes rather than in three weeks.

Qualified individuals who are interested in participating in the trial may phone Kevin Wanebo, Research Associate at the Center (303-315-8796), for more information. People who smoke, or who were previous smokers, are excluded. Women who plan on starting a family in the near future are also excluded. This will be a three-year trial, so people who expect to move out of the area in the near future will also be asked not to participate. Participants will be paid $250 for the first year and $200 for the second and third years to help defray travel, parking and other costs.

THE BDC CALENDAR

October 17
Grandparents Workshop
$25, full day

October 21
Toddler Support Group
no fee,
11:30 a.m. to 1:30 p.m.

November 14
School Nurse Program
Professional Program
"Taking Diabetes to School"
Approximately $60,
8 a.m. to 4 p.m.

NOTE DATE CHANGE:
The original date for the Professional Program has been changed from November 7th to November 14th.
(303) 315-8796
FOR REGISTRATION

QUESTIONS & ANSWERS

— H. Peter Chase, M.D.
Clinical Director

Q. With all of the good glucose meters having memories of blood sugar values which can be printed out in clinic, do I still need to write down every blood sugar value?

A. Unfortunately, the answer is ***YES***. It is just as important to write values down now as it was seven years ago when meters did not have memories. It is important to look for "trends" in blood sugar levels to know when to make changes in insulin dosages. If a person or family does not do this, they are not doing a good job of home diabetes management. One of my top "pet peeves" in diabetes care is to have a patient or family do blood sugars and to constantly have values that are too high or too low, but who don't make changes between clinic visits or fax the values to someone who can make suggestions.

Our general rule of thumb is that if more than half of the values at any time of day are above the upper level (usually 180 for 5 to 17 years old, or above 150 if 18 years or older), an increase in the insulin dose is needed. For example, if a 12 year-old has all morning values above 180 mg/dl (10mmol/L) for a week, the evening long-acting insulin should be increased by one unit. Similarly, if the pre-dinner values are all above 180 mg/dl (10mmol/L) for a week, the morning long-acting insulin dose should be increased by one or two units. If the values are not being recorded in such a way that values done at the same time of day can be easily compared, it is possible that these trends will be missed. The sheets on pages 40 and 41 in the 8th Edition of *Understanding Insulin-Dependent Diabetes* are ideal for this (and can be copied from the book as often as desired). The converse is also true that if there are more than one or two values in a week below 60 mg/dl (3.24mmol/L) at any time of the day, the insulin dose working at that time can be reduced. Pages 40 and 41 are designed for easy faxing, and if there is a question whether the doses should be changed, the page can be faxed to the health-care provider (most schools and work places now have fax machines). The faxing of the blood sugars saves valuable doctor/nurse time in having to sit at a phone and write down results. Our Center now averages over twenty patient faxes per day, and it is considered part of the service of the clinic visits every three months.

For the young child or teen who does not want to write values down, it is often acceptable for the parent to push the "M" (memory) button at the end of the day and record the values. This is a way for the parents to stay involved, and most teenagers agree to accept this help. The parent is often the family member who does the faxing to the health team as well.

Q. Is it true that growth is reduced by poor sugar control?

A. Research published from our Center in 1995 (*Diabetic Medicine*, Vol. 12, 129-133) was one of the first studies to use longitudinal HbA_{1c} values to show that optimal growth is not reached if longitudinal HbA_{1c} values are not in a good range. In addition to the growth rate of the person with diabetes, the final adult height was compared to that of siblings as well as the expected adult height based on the parents' heights. All were reduced in people with increased HbA_{1c} values. In contrast, growth was not altered in people who kept their HbA_{1c} values in a good range.

Q. How can I predict what my final adult height will be?

A. Looking at your growth chart when you are in clinic is one way to estimate final height. Knowing when your parents had their growth spurts is often helpful.

For people with diabetes, the longitudinal HbA_{1c} values will cause a reduction in this estimate if the HbA_{1c} values have been high.

THERE ARE FORMULAS THAT SOME PEOPLE USE TO ESTIMATE FINAL ADULT HEIGHT, i.e.:

FOR GIRLS:

Father's height, minus 5", plus Mom's height, ÷ total by 2 = final adult height

AND FOR BOYS:

Mom's height, plus 5", plus Father's height, ÷ total by 2 = final adult height

THE BARBARA DAVIS CENTER ON THE WORLDWIDE WEB

— H. Peter Chase, M.D.
Clinical Director

Some of you might like to visit the Center's Web site at: **http://www.uchsc.edu/misc/diabetes/bdc.html**

In February 1997, we had 1500 people enter our site, or 1500 "hits." The Web site includes the text of the 8th edition of our educational book, *Understanding Insulin-Dependent Diabetes*. It also includes the Foundation's newsletter, *NEWSNOTES*, which contains nutrition information and wonderful recipes, ongoing research, clinic news, training programs, publications and DPT information. In *NEWSNOTES,* you will also find BDC patient news, activities for children and young adults with diabetes, scholarship information, calendar of events and access to other diabetes-related Web sites.

Surprisingly, people who have been in the Web site often send e-mail to the Center. An example of a message we received is shown below:

Mail*Link SMTP
Exercise & Diabetes
Diagnosed diabetic recently at the age of 40, I have been injecting insulin now for four months and am still finding my way with regard to exercise. It has been tremendous help reading your page on the Web (via AOL) as I am a keen soccer player and am having trouble combining exercise and diabetes control. But you are helping me learn. Thank you very much. Best wishes,

Malcolm Bryant,
Hull, England

A VOTE OF THANKS TO SKI TRIP VOLUNTEERS!

Each year some very special people give countless hours of their time to make the BDC ski trips a huge success. The CDF Ski Program presents a great opportunity for skiers of all levels, ages 8 to 18, to enjoy day trips to beautiful Winter Park and includes expert supervision by BDC staff members and the Program Coordinator, Bob Owen, who has enthusiastically organized these trips time and again. Bob, CDF and the BDC extend their hearty thanks to the following BDC staff members: Dr. Peter Chase, Dr. Peter Gottlieb, Dr. Phillipe Walravens, Dr. Marian Rewers, Dr. Eric Simone, and Sandy Hoops, P.A. We couldn't have done it without your help, and the kids had a blast!

MOMS CLUB FIGHTS DIABETES

The Children's Diabetes Foundation at Denver is grateful to the "MOMS Club" of Boynton Beach, Florida for their continuing contributions to the Brass Ring Fund totaling $244, and for sending information about their non-profit national organization which provides support for mothers.

Gail Mazzaferro, Vice President of the Boynton Beach Chapter, said the goals of MOMS Clubs around the nation are to provide: moral support to at-home mothers; a forum for topics of interest; a voice in the community from mothers; and a chance to participate in service projects, many of which benefit children. Thank you MOMS!

Members of the "MOMS Club" of Boynton Beach, FL sold T-shirts and donated proceeds to the Brass Ring Fund

High-powered dragsters prepare to race at the Bandimere event

ELIMINATOR CHALLENGE A THUNDERING SUCCESS

Onlookers were thrilled by the amazing sights and sounds at CDF's drag race extravaganza at Bandimere Speedway on Saturday, June 21st, benefitting the Children's Diabetes Foundation at Denver and promoting public awareness of the symptoms of diabetes. Funds raised at the event benefited the clinical care and research programs at the Barbara Davis Center. The electrifying event at Bandimere Speedway in Morrison, Colorado featured dragsters, jet cars, funny cars and the mesmerizing Eliminator Challenge, a 16-car challenge race featuring guest celebrity drivers, special guest U.S. Senator Ben Nighthorse Campbell; Dave Aguilera-Channel 4; Brien Allen and Ron Allen-Channel 7; Jeff Barlow and Tom Laugeson-Mike Shaw •Chevrolet•Geo•Buick; Todd Romero and Joe Franzgrote-9NEWS; Ed Lozano and Ernest Gurulé-Channel 2; Mike Haynes, Voice of the Avalanche; Gary Scrivner and Jim Lakin-Lakin/Scrivner; Marta Dillon and Chaz Smith-Rocky Mountain News; and Victoria Taunton-fiancée of Mike Haynes.

Generous corporate sponsors were: Rocky Mountain News; Jim and Elaine Lakin, Linda and Gary Scrivner; Mike Shaw•Chevrolet•Geo•Buick; John and Nancy Cowee; Lee and Victoria Cooper; King Soopers; Olé and Marty Jensen; Medved Autoplex; Villano Brothers; EAS of Golden; Continental Volkswagen; Frito-Lay®; Pepsi®; and Gateway Mazda. Our sincere thanks to the wonderful people at Bandimere Speedway, to our celebrity drivers and corporate sponsors, the media and volunteers for helping to increase awareness of diabetes.

CDF's Eliminator Challenge provided spectacular entertainment for all and raised essential funds to improve the quality of life for courageous children and young adults afflicted with diabetes.

Nancy and John Cowee, Co-Chairmen of the Eliminator Challenge

A popular celebrity guest at Bandimere, Senator Ben Nighthorse Campbell, on his custom Harley Davidson

Ernest Gurulé, Joe Franzgrote, Todd Romero and Brien Allen are geared up to race at Bandimere

Photos: Tom Masamori

SCHOOL LUNCH: BUY IT OR BAG IT?

— Markey Swanson, R.D., C.D.E.

With the new school year upon us, it's the age old question: What to do about school lunch? Most parents really don't have a clue when it comes to knowing what their child consumes at school lunchtime. If they buy lunch—do they eat it? If they "brown bag"—do they trade it? When your child has diabetes, this information is important, though many times parents would really rather NOT know! The choices made at lunch time are often not what you would choose for your child.

For starters, let's look at what school lunches usually provide. Schools must offer 8 ounces of milk, 2 ounces of meat or a meat alternative, two servings of fruit and/or vegetable (3/4 to 1 cup, depending upon child's age) and a minimum of one serving of grain/starch per day. In a one week period, 12-15 servings of grain/starch must be provided, depending upon age. Schools must offer five food choices as outlined, but children are required to take only three to four choices, depending upon the requirements of the local school food authority. As you can see, intake will vary, especially in the amount of carbohydrate.

As we all know, many schools offer food choices other than "traditional" lunches, especially as children progress to middle school and into high school. Often various fast food items are available. Some of the more popular choices, along with carbohydrate information are listed here.

RESTAURANT	FOOD/PORTION	CARBOHYDRATE GMS.
Pizza Hut	1 slice Pepperoni Personal Pan, Pepperoni	28 gms 69 gms
Subway	(1) 6" Cold Cut	43 gms
Taco Bell	1 Soft Taco 1 Bean Burrito Nachos Cinnamon Twists	19 gms 58 gms 37 gms 20 gms
McDonald's	1 Quarter Pounder w/cheese Chicken McNuggets 1 pkt sauce	37 gms 16 gms 12 gms

Keep in mind, the items listed are quite high in FAT! In addition, other items such as bagels and soft serve ice cream will most likely be available. While these choices are usually low in fat, the portions are often large and the amount of carbohydrate is much more than you might calculate.

The best you can do as a parent, is to encourage your child to eat a healthy lunch. For grade school children with diabetes, a good rule is to ask that your child consume at least half of the lunch provided and drink the milk before rushing out for recess. (Lunchroom attendants may be able to assist with this.) When you are aware that your child is not making the greatest food choice at lunch, allow for this and assist with insulin management. Your best defense is to provide healthy food choices in your home.

Just for fun, some bag lunch recipes follow . . . and they're not the usual PBJ. Add a drink and a couple of extra items (string cheese, fruit, yogurt) and you've got lunch!

PEANUT BUTTER MUFFINS

INGREDIENTS

2 cups all purpose flour
1-1/2 teaspoons baking soda
1/8 teaspoon salt
1/2 cup crunchy peanut butter
1/4 cup dark brown sugar
1 egg
1 cup skim milk

NUTRITION INFORMATION

Number of Servings: 12
Serving Size: 1 muffin
130 calories per serving
21 grams carbohydrate
4.5 grams protein
3 grams fat

PREPARATION

Preheat oven to 350 degrees. Line muffin cups with paper liners. In small bowl, combine flour, soda and salt and set aside. Cream peanut butter and brown sugar and add egg, mixing completely. Alternate adding the flour mixture and the milk to the peanut butter mixture, stirring after each addition and ending with flour mixture. Spoon into paper-lined muffin cups and bake 20 minutes or until done.

KANGAROO POCKET PITAS

INGREDIENTS

Whole pita bread, cut in half
2-6" lettuce pieces
1/2 cup grated carrot
2 tablespoons peanut butter
1 tablespoon raisins
1 tablespoon sunflower nuts
1/2 Jonathan apple, chopped

PREPARATION

Line each half pita with lettuce piece. Mix all remaining ingredients and divide into two equal portions. Stuff each pita pocket with one portion of filling.

NUTRITION INFORMATION

Makes two sandwiches
Portion: 1 sandwich
25 grams carbohydrate
7 grams protein
5 grams fat

Cindy Barton '97

Ryan Roberts at the 1997 Junior Olympics at Vail

1997 Ritter Trophy winner Ryan Roberts

SKIER FOCUSES ON OLYMPIC GOAL

Fourteen-year-old Ryan Roberts is a member of the Steamboat Springs Winter Sports Club and is a terrific skier who participated in the Junior Olympics in Vail. He has diabetes and manages all of his activities while overseeing the precise management of his disease. On April 16th, Ryan was awarded The Ritter Memorial Courage Cup by the Steamboat Springs Winter Sports Club. The award was given to Ryan for his special courage and for being an inspiration to others.

Up to seven times a day, Ryan pricks his finger to test his blood sugar and gives himself a shot of insulin three times daily. He sometimes has to miss out on favorite activities to stick with his testing schedule. Ryan accepts this routine as a necessary part of his life to keep him healthy. Due to the stress and rigorous physical demands of skiing, he follows a different schedule on days when he races and tests more often, beginning just before his training starts. On those challenging days, he eats more carbohydrates, carries more fluids like LTP Gatorade and brings along some candy just in case. His teammates have learned the signs and symptoms of low blood sugar, and if Ryan is exhausted or pale, they know what to do.

Ryan learned to ski at age two, and nothing has stopped him from doing what he loves. Now he is aiming for the Olympic Ski Team. With the capable management of his diabetes, coupled with his determination and zest for life, Ryan Roberts will probably do just that! We're all rooting for you, Ryan. *GO FOR THE GOLD!*

Photo: Linda Huebner

BDC volunteers, standing from left Bea Bugelli, Stella Grimes, Judy Villano, Herb Bartlett, Nancy Reed, Frieda Eisenbarth, Dolores Sullivan, Nancy Michener. Seated L to R, Doris Stathopulos, BDC volunteer coordinator Kathy Griffis, Faye Glick, Sarita List, Marilyn Friedrich.

SALUTE TO BDC VOLUNTEERS

The Denver Country Club was the setting on May 15th for the BDC Volunteer Luncheon honoring the hard-working Clinic Volunteers. The special luncheon was expertly organized by Guild President-Elect Marty Jensen.

Guild Guide — Linda Huebner Guild Guide Editor

Photo: Linda Huebner

L to R, Guild President-Elect Marty Jensen, 15-year volunteer Sarita List, and Guild President Linda Broughton

Guild President Linda Broughton presented Barbara Davis Center volunteer Sarita List with a special gift for 15 years of dedicated service. Attendees also included BDC volunteers Nancy Michener, Stella Grimes, Judy Villano, Doris Stathopulos, Bea Bugelli, Faye Glick, Herb Bartlett, Frieda Eisenbarth, Dolores Sullivan, Stacey Preblud, Nancy Reed, Marilyn Friedrich, Lynn Bentsen, BDC volunteer coordinator Kathy Griffis and Sue Palandri, CDF Director of Finance.

In her message of thanks to honored guests, Marty Jensen compared the centerpieces comprised of vigorous strawberry plants spreading their tendrils, to the BDC volunteers who reach far beyond what is asked of them to dedicate countless hours to help children afflicted with diabetes. Clinic Volunteers are a source of tremendous help to the Center's busy staff members. They brighten the day for clinic patients by making them feel welcome and helping them during their visits to the Center.

PARENT SUPPORT GROUPS NEEDED

Many phone calls have been received from families asking about local support groups. We are looking for parents and/or guardians of children with type I diabetes to organize or join a parent support group in the following areas: Denver, Littleton, Englewood, Lakewood, Wheatridge, Arvada, Aurora, Highlands Ranch and Golden. A new support group has formed in the Boulder area. Ten families have already joined the Boulder group and are enjoying potluck suppers, sharing ideas and giving support to one another while their children play. If you are interested in joining the Boulder group, call Sonia Cooper at 444-1345. For additional information on joining or organizing a new support group, call Sue Palandri or Linda Schneider at the Foundation office, (303) 863-1200.

CONGRATULATIONS CHARLOTTE TUCKER SCHOLARSHIP WINNERS!

The Wellshire Inn was the setting for The Guild's luncheon honoring college-bound Charlotte Tucker Scholarship winners and their parents. The selection of scholarship winners from many impressive candidates involves detailed consideration of the records of each student by scholarship committee members. This year's annual Scholarship Awards Luncheon was arranged by chairpersons Sharon Whiton Gelt and Julia Peay. Chairperson for The Guild's Scholarship Committee was Judy Villano.

BOOK ORDER FORM

Name _____

Address _____

City/State _____

Zip _____ Phone _____

Understanding Insulin-Dependent Diabetes $10 per copy (includes postage) _____ Quantity

A Coloring Book About Diabetes $4 per copy (includes postage) _____ Quantity

Kid's Cupboard: A cookbook chock full of treats for all ages $10 per copy (includes postage) _____ Quantity

Make check payable to: The Guild–CDF at Denver

All orders must be paid in full before delivery. Books are mailed 4th class book rate – allow 1 to 3 weeks for delivery. Large orders are shipped UPS.

Canadian and Foreign Purchasers: Please include sufficient funds to equal U.S. currency exchange rates and international postage.

For additional information call (303) 863-1200 or (800) 695-2873.

Mailing address: **The Guild of the Children's Diabetes Foundation 777 Grant Street, Suite 302 Denver, CO 80203**

Some of the 1997 scholarship winners L to R, rear, Adam Waterman, Davis Moore, Tim Deal, Scott Coulter, Corey Shaw, Patrick Cochran; front row, Jeanette Larsen, Kristen Noel, Nicole Pike, Maggie Zochol

Each year, $1,000 awards are given by The Guild of CDF to help defray college expenses for 30 students treated through programs at the Barbara Davis Center. The Charlotte Tucker Scholarship program was established in 1990 as an ongoing tribute to a past president of The Guild, who inspired and encouraged BDC patients to be relentless in their pursuit of higher education to help them reach their goals in life.

Following the luncheon, each student spoke about plans, hopes and dreams for college and beyond. The Barbara Davis Center joins the Children's Diabetes Foundation in extending hearty congratulations to the enterprising 1997 scholarship winners.

Photos: Linda Huebner

L to R, Guild President Linda Broughton, Scholarship Chairman Judy Villano and Scholarship Awards Luncheon Co-Chairmen, Julia Peay and Sharon Whiton Gelt

GUILD CALENDAR

September 11
Brass Ring Luncheon* & Fashion Show
Hyatt Regency Denver
Neiman Marcus presents
"THE ART OF FASHION"

**An event of the Denver Nuggets Community Fund to benefit charities such as the Children's Diabetes Foundation at Denver. The Denver Nuggets Community Fund is a fund of the Robert R. McCormick Tribune Foundation.*

88
8

October Halloween Party - date to be announced

303-862-1200 OR
800-695-2874
FOR INFORMATION

GUILD MEMBERSHIP FORM

YOUTH MEMBERSHIP Any youth 18 years of age or under: Annual dues of $2.00 per person

ASSOCIATE MEMBERSHIP Annual dues of $30.00 per person

PATRON MEMBERSHIP Annual dues of $50.00 per person

LIFETIME MEMBERSHIP One-time dues of $250.00 per person

Name _____

Address _____

City/State/Zip _____

To actively participate in The Guild as a volunteer, please check your choice(s) below:

_____Barbara Davis Center Patient Check-In
_____Barbara Davis Center Playroom
_____Brass Ring Luncheon
_____Halloween Party

Make check payable to:
The Guild – CDF at Denver, and mail to:
The Guild, Children's Diabetes Foundation
777 Grant Street, Suite 302
Denver, CO 80203

For information, call (303) 863-1200 or (800)695-2873

1997 CHARLOTTE TUCKER SCHOLARSHIP WINNERS!

The Children's Diabetes Foundation and the Barbara Davis Center congratulate the winners of the 1997 Charlotte Tucker Scholarship awards!

The Charlotte Tucker Scholarship program was established in memory of a Guild member who encouraged the children of the Barbara Davis Center to follow higher carrer and/or educational pursuits of their choice. For information and applications, call the CDF office at (303) 863-1200 or 800-695-2873.

Robert Antonelli, Mesa State College

Britney Bancroft, Montana State University

Renee Bender, Colorado State University

Molly Buster, Colorado State University

Patrick Cochran, Colorado Institute of Art

Melody Conrads, Colorado State University

Scott Coulter, University of N. Colorado

Sarah Covell, Davidson College

Tim Deal, Colorado State University

Bridget Greer University of N.Colorado

Jazzmine Hall, The American Musical and Dramatic Academy

Corey Hostetler, Metropolitan State College of Denver

Tessa Jenkins, Northwest College

Jeanette Larsen, Ricks College

Ryan Mandeville, Gonzaga University of Spokane WA

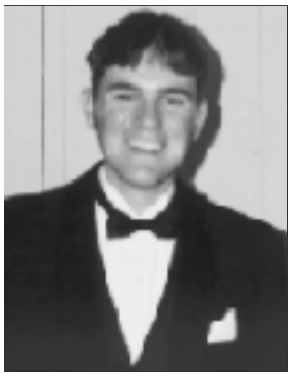
Tim McMahan,
Colorado State University

Davis Moore,
University of Wyoming

Kristen Noel,
University of CO at Boulder

Casey Olsen,
Dawson Community College

Nicole Pike,
University of CO at Boulder



Micah Risher,
Cornell College

Luke Schuessler,
Wisconsin Lutheran College

Paul Schuessler
Wisconsin Lutheran College

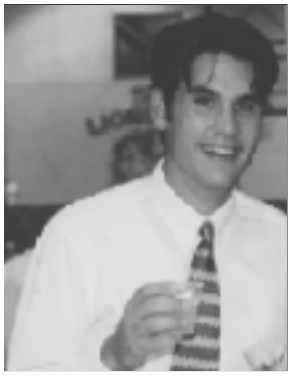
Michael Schwab
Hastings College

Zachary Sexton,
Northland College

Corey Shaw,
University of Wyoming

Joe Sprowls,
Colorado State University

Amber Townsend,
University of Wyoming



Adam Waterman,
University of Colorado

Ron Wright,
Colorado State University

Maggy Zochol, University
of Nebraska at Lincoln

Dedicated firefighter, Joshua Mulroney, during strenuous career training at Vail, CO

COURAGEOUS FIREFIGHTER SENDS MESSAGE OF HOPE

— Robin and Dan Mulroney

Once a young person becomes a senior in high school, people begin asking the big question, "What are your career goals and how are you going to achieve them?" By the time Joshua Mulroney finished his senior year at Highlands Ranch High School, he'd come up with his answer . . . "I'm going to be a firefighter." Then his journey began.

Josh was diagnosed with diabetes when he was five years old. Three months later, he was insisting on giving his own injections. That's when we knew this young boy would be the one in control and not the disease.

In high school, Josh chose one of the more difficult sports a diabetic could be a part of, wrestling. At the time, Josh was one of the youngest students to make the varsity wrestling team. He carefully kept track of his blood sugars and at the same time maintained his weight, which is an important aspect of the sport.

After graduation, Josh received the Charlotte Tucker Scholarship Award and used the opportunity to receive his Emergency Medical Technician Certification at Arapahoe Community College. During that time, he attended the Vail Fire Academy and took the entrance exam with the Vail Fire Department. He had to go through an Oral Board Review and was timed against applicants in a physical agility test which required running, climbing ladders and lifting and carrying heavy hoses. Josh was the youngest person to take the test and the only diabetic. Out of 18 participants, Josh came in third, and in May 1997, Josh packed up his car and moved to Vail for yet another step toward his goal.

Josh now lives at the Fire Station in Vail. This summer he is taking classes such as Hazardous Materials, Building Inspections and Sprinkler Controls at Colorado Mountain College. On weekends, he must also attend training sessions with the fire department and be on duty four days a month. Josh also works at a local retail store when he can squeeze in the time.

None of this would be possible for Josh without the proper care and maintenance of his diabetes. Besides eating well and monitoring glucose levels, Josh has had to make some plans for those "just in case" times. He has stocked a backpack with glucose tablets and snacks. If he goes out on a "call," he will be able to maintain his needs while caring for others.

Joshua is going to be a leader in this challenging career as a firefighter with diabetes. He has already run into some prejudice with regard to his career choice, but he answers each skeptic the same way . . . "Watch me, and see what a diabetic can do."

BDC patient, Ariella Goldman

ARIELLA GOLDMAN MANAGES DIABETES WITH CONFIDENCE

My name is Ariella Goldman. I am nine years old and going into the fourth grade. I've had diabetes for 2½ years and I need three shots of insulin a day. I've been giving myself shots for about two years. My doctor's name is Marian Rewers. At first he said I shouldn't give my own shots. Before I had my first shot, my Dad let me give him a shot with an empty syringe. I hit a nerve, but he didn't tell me at the time because he didn't want me to get scared.

When I first found out that I had diabetes, I was sort of shocked because I never heard of anything like it. I thought I would never be able to eat candy again! About a year ago I learned how to read the ingredients on cereal, candy, and other

food boxes, so I could figure out how much I could eat. On days we have birthday snacks at school, I always look at the ingredients. If we have cake, I scrape the icing off.

For two years I've been walking the Boulder Bolder. It is 6.2 miles and finishes at the CU stadium. Last year I got low, but this year I drank LTPGatorade, because every few blocks there were cups of it. I don't just walk—I bike, swim every Thursday, and I take Tae Kwon Do. On the computer, my dad makes these sliding scales so I know how much insulin I should get. One time on the *Wall Street Journal's* website, we found an article on diabetes. It was really cool.

All I hope for is a cure for diabetes. Still, I know not to keep my hopes up too high. Ariella Goldman, 9.

Note: Ariella, the Barbara Davis Center is filled with hope and determination to find the cure, but in the meantime, keep up the great work you're doing with managing your diabetes!

Printed on recycled paper

Sarah Hill with Doran Azari, Judge at the Brighton, Colorado competition

BDC PATIENT SARAH HILL EXCELS AT VIOLA COMPETITIONS

In May, I participated in the solo and ensemble viola competition in Brighton, CO and played a solo, a duet and two ensembles on my viola. The marks I received were "1" on each of my entries (the best score possible), and a "1" in the large group contest my orchestra participated in this spring. I received five medals and two trophies, both at school and in various contests. Sarah Hill, 13.

Note from H. Peter Chase, M.D.: Sarah was diagnosed with IDDM two years ago and has done an excellent job of managing her diabetes. She made friends with Sarah Swann from England at diabetes camp last summer and is looking forward to seeing her again this summer. Diabetes has obviously not slowed Sarah down!

NEWSNOTES is published three times per year by the Children's Diabetes Foundation at Denver. We welcome your comments. If you would like to submit an article or a letter to *NEWSNOTES* send information to:

Children's Diabetes Foundation at Denver
777 Grant Street, Suite 302
Denver, CO 80203

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Know the symptoms of Childhood Diabetes:
- **Loss of weight**
- **Extreme thirst**
- **Excessive irritability**
- **Frequent urination**

A child reaching for the brass ring on a carousel is symbolic of the most important goal of the Children's Diabetes Foundation — a cure. Your contribution on behalf of a loved one will make a difference. It will support treatment programs to assist children with diabetes in leading healthier lives; and it will fund research to help CDF "catch the brass ring" by finding a cure.

Mark an anniversary, birthday, special occasion, express appreciation or make a memorial tribute in honor of someone special with a contribution — for any amount — to the Children's Diabetes Foundation at Denver. Donations are tax deductible. Tax ID #84-0745008

The Brass Ring Fund

Remember a loved one —
Help CDF "Catch the Brass Ring"

Enclosed is my Contribution of $ _____
In memory of _____
Or in honor of _____
Occasion _____
Please send acknowledgements to:
(Amount of gift will not be mentioned)
Name _____
Address _____
City _____ State _____ Zip _____
From:
Name _____
Address _____
City _____ State _____ Zip _____

Children's Diabetes Foundation at Denver
777 Grant Street, Suite 302, Denver, CO 80203

NEIMAN MARCUS AND DENVER NUGGETS JOIN FOR ANNUAL BRASS RING LUNCHEON*

L to R, Jan Cortez, Kick-off Chairman with Diane Sweat, Chairman of the Brass Ring Luncheon and Fashion Show

Photo: Linda Huebner

The Brass Ring Luncheon Kick-off, chaired by Jan Cortez, was held June 3rd at the Hyatt Regency Denver. Christel Dikeman and Nancy Husted of Neiman Marcus presented an exciting preview of styles which will be highlighted at the Brass Ring Luncheon set for September 11th at the Hyatt Regency Denver.

Chairman of the prestigious September event is Diane Sweat. The theme of the luncheon is *THE ART OF FASHION, featuring The Best of Neiman Marcus*, and headlining the American and European Collections of Ognibene Zendman, Giorgio Armani, Escada, John Paul Gautier, Gucci, Donna Karan, Badgley Mischka, Moschino, Oscar de la Renta, St. John, Valentino and Emanuel Ungaro. Cocktails and hors d'oeuvres will be served prior to the start of the fashion show.

The Patron Reception, chaired by Marsha Bolen, will be at Neiman Marcus on the day following the event for platinum and gold ticket holders. Two fabulous door prizes from the Hyatt Regency Denver can be won by attending the Brass Ring Luncheon and Fashion Show: A weekend night for two, with dinner at the Hyatt restaurant, "1876," or two nights at a spectacular Hyatt Regency Resort. Proceeds of the event support essential research, treatment and educational programs at the Barbara Davis Center for Childhood Diabetes.

Ticket prices are:
Platinum-$250
Gold-$150
Brass Ring-$65
A sellout is expected. Tickets may be purchased by calling 303-863-1200.

**An event of the Denver Nuggets Community Fund to benefit charities such as the Children's Diabetes Foundation at Denver. The Denver Nuggets Community Fund is a fund of the Robert R. McCormick Tribune Foundation.*

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