2008
Network of Minority Research Investigators Membership Directory

National Institute of Diabetes and Digestive and Kidney Diseases

Contents

Mission Statement

The Office of Minority Health Research Coordination of the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) has established a communication network of current and potential biomedical research investigators and technical personnel from traditionally underserved communities: African American, Hispanic American, American Indian, Alaska Native, Native Hawaiian, and other Pacific Islanders. The major objective of the Network is to encourage and facilitate participation of the members of underrepresented racial and ethnic minority groups in the conduct of biomedical research in the fields of diabetes; endocrinology; metabolism; digestive diseases; nutrition; and kidney, urologic, and hematologic diseases. A second objective is to encourage and enhance the potential of the underrepresented minority investigators in choosing a biomedical research career in these fields. An important component of this network is the promotion of two-way communications between Network members and NIDDK.

Through the Network of Minority Research Investigators (NMRI), NIDDK will elicit recommendations for strategies to enhance the opportunities of and to implement mechanisms for supporting minority investigators in biomedical research. The NMRI will advance scientific knowledge and will contribute to the reduction and eventual elimination of racial and ethnic health disparities.

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Dr. Rodgers is the Director of the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) of the National Institutes of Health, a position he has held since April 1, 2007, after holding the post of Acting Director for 1 year. As Director, Dr. Rodgers oversees a national research program in diabetes, endocrinology, and metabolic diseases; digestive diseases and nutrition; and kidney, urologic, and hematologic diseases, the goal of which is to improve the health and quality of life for all Americans. Prior to leading the Institute, Dr. Rodgers served as its Deputy Director from 2001, a position that he still holds. An active researcher, Dr. Rodgers also is Chief of the Molecular and Clinical Hematology Branch of NIDDK's Intramural Research Program.

A native of New Orleans, Dr. Rodgers received his undergraduate, graduate, and medical degrees from Brown University in Providence, Rhode Island. He was an intern, resident, and chief resident in internal medicine at Barnes Hospital and the Washington University School of Medicine in St. Louis, Missouri. His fellowship training in hematology was in a joint program of the National Institutes of Health, The George Washington University, and the Washington Veterans Administration Medical Center. Dr. Rodgers also recently received a Master of Business Administration degree with a concentration in the Business of Medicine from The Johns Hopkins University in Baltimore, Maryland.

Dr. Rodgers is widely recognized for his contributions to the development of the first effective—and now Food and Drug Administration-approved—therapy for sickle cell anemia. He served as the principal investigator in clinical trials to elevate pharmacologically fetal hemoglobin to counteract the deleterious molecular and cellular effects present in the red cells of these patients. Dr. Rodgers' basic research has focused on understanding the molecular basis of how these drugs induce gamma-globin gene expression. His laboratory also focuses on the identification and characterization of early markers of hematopoietic stem cell lineage-specific differentiation, and on the application of hematopoietic stem cell-based approaches to thalassemia and sickle cell disease, including transplantation and gene therapy strategies.

Dr. Rodgers has been honored for his research with numerous awards, including the Public Health Service Physician-Researcher of the Year and Hildrus A. Poindexter Awards, the Richard and Hinda Rosenthal Foundation Award, the Arthur S. Flemming Award, and Mastership in the American College of Physicians, among others.

Dr. Rodgers has served as Distinguished Lecturer and has delivered several named lectures nationally and internationally. He has published more than 150 original research articles, numerous reviews, book chapters, books, and monographs. He is a member of the editorial board of several scientific journals.

Dr. Rodgers served as Governor to the American College of Physicians for the Department of Health and Human Services, and is a member of the American Society of Hematology, the American Society for Clinical Investigation, and the Association of American Physicians. He is the Chair of the Hematology Subspecialty Board, and is a member of the American Board of Internal Medicine Board of Directors.

Lawrence Y. Agodoa, M.D.

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Dr. Agodoa is a Program Director at the National Institutes of Health (NIH) and a Professor of Medicine in the F. Edward Herbert School of Medicine, Uniformed Services University of the Health Sciences (USUHS). His current duties include the following:

- Director, Office of Minority Health Research Coordination at the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK), NIH
- Director of the End-Stage Renal Disease Program in the Division of Kidney, Urologic, and Hematologic Diseases
- Program Scientist and Coordinator of the Multicenter Clinical Study, The African-American Study of Kidney Disease, and the Hypertension Cohort Study
- Co-Project Officer of the End-Stage Renal Disease Database, the United States Renal Data System.

Dr. Agodoa graduated from Cornell University College of Medicine in 1971. He completed his internship and residency training in internal medicine at the University of Washington Hospital in Seattle, Washington, and a 3-year training program in clinical and biomedical research in nephrology and renal pathology. Dr. Agodoa was Chief of the Nephrology Service at the Madigan Army Medical Center in Tacoma, Washington, from 1976 to 1981. In 1981, he returned to the University of Washington and completed 2 years of clinical and research training in rheumatology and immunology. In 1983, Dr. Agodoa was assigned to the Walter Reed Army Medical Center as Assistant Chief of the Nephrology Service and the Nephrology Training Program and also was appointed to the Faculty of Medicine at USUHS. In 1985, he was appointed Director of the Military Medical Research Fellowship at the Walter Reed Army Institute of Research.

In 1987, Dr. Agodoa was appointed Director of the Clinical Affairs Program in the Division of Kidney, Urologic, and Hematologic Diseases, NIDDK. He also was a research scientist in the Laboratory of Cell and Molecular Biology, NIDDK, from 1987 to 1992.

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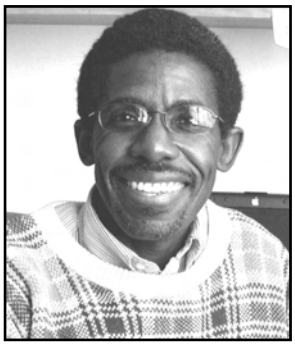
Research Interests

I am very interested in clinical research related to liver diseases. To be more specific, I have a special interest in exploring the area of viral hepatitis and in developing novel therapeutic approaches, including new agents. I am also interested in the area of interventional approaches for cases with chronic advanced liver disease.



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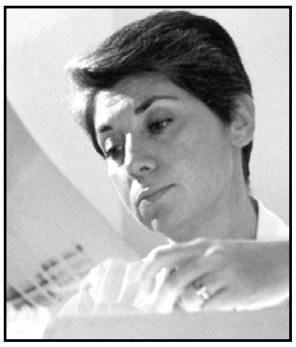
Research Interests

My research is focused on elucidating the molecular mechanisms that are responsible for cardiac muscle injury in diabetes. The laboratory is examining the role of altered insulin signaling and altered fatty acid and glucose utilization and the role of mitochondrial dysfunction. My research is supported by grants from the National Institutes of Health, American Diabetes Association, American Heart Association, and Juvenile Diabetes Research Foundation.



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Research Interests

We have for several years been interested in understanding the molecular mechanisms by which glucose stimulates insulin secretion, in particular the role that ATP-sensitive K+ channels (KATP) play in this process. Our laboratory cloned the high-affinity sulfonylurea receptor (SUR1), the regulatory subunit of this channel, and we have been screening for mutations in patients with insulin secretory abnormalities, such as neonatal diabetes, type 1 and type 2 diabetes, ketosis-prone diabetes, and hyperinsulinemic hypoglycemia, and doing structure-function studies. It has become clear that mutations in SUR1 result in more than an ion channel defect. We have also worked on the role that these channels may play in the apoptotic process or preconditioning effect in pancreatic β cells and in the brain. We are now working on the role that the intrauterine environment may play in beta cell dysfunction later in life. We have been developing a rat model of intrauterine growth retardation and will be looking at gene expression from e14.5 to adulthood.

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Research Interests

My research interests are diabetes and metabolism.

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Research Interests

My research interests include skeletal muscle function and metabolism, integrated biochemical and physiological approaches to the study of prototypical and atypical skeletal muscles and the process of how they are altered by age, neuromuscular disorders, and the study of preferentially targeted or spared motor groups to determine protective strategies.

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Research Interests

My research interests include ethnic differences in type 2 diabetes and its complications, cardiovascular disease, visceral fat accumulation, adipocytokines, osteoporosis, and nonalcoholic fatty liver disease among postmenopausal Filipino, African-American, and Caucasian women. Other interests include metabolic abnormalities among HIV-infected children.

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Research Interests

I have been conducting research on lifestyle modification since 1995, my third year as a medical student at Duke University. Since then, I have worked on National Heart, Lung, and Blood Institute (NHLBI)-funded multicenter trials, including the Dietary Approaches to Stop Hypertension (DASH), DASH-sodium, Lifestyle Interventions for Blood Pressure Control (PREMIER), and Weight Loss Maintenance Trials. During 2000-2001, I was supported by a minority supplement to PREMIER (HL60570-S1). During this period of time, I made significant scientific contributions to the project by developing and conducting three ancillary studies: (1) a general clinical research center-supported study of the effect of the PREMIER behavioral interventions on insulin sensitivity, (2) a focus group study of the cultural appropriateness of PREMIER for African Americans, and (3) a study of the effect of the acculturation of African Americans on outcomes in PREMIER.

At the University of Alabama at Birmingham, I continue to conduct research in obesity and behavior modification and am currently the Principal Investigator (PI) of several studies aimed at improving cardiovascular disease risk factors in African-American populations using culturally appropriate interventions.

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Research Interests

Research in my laboratory is driven by the hypothesis that the binding of agonist to the lutropin and follitropin receptors (LHR and FSHR) results in the activation of multiple signaling pathways and that these pathways, either alone or in combination, stimulate the proliferation and differentiation of their respective target cells (Leydig and Granulosa cells).

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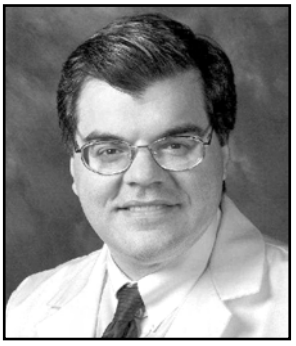
Research Interests

My research interests involve elucidating the molecular mechanisms of and biomarkers for cancer development in the lung, esophagus, stomach, liver, colon, and rectum.



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Research Interests

My research interests include the study of the polycystic ovary syndrome (PCOS); insulin action in adipocytes; the role of the adrenal in hyperandrogenic disorders; the nonclassic adrenal hyperplasias (NCAH); the genetics of hyperandrogenic disorders, including PCOS and NCAH; the treatment of hirsutism; and the regulation and physiology of adrenal androgens.

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Research Interests

I am mainly interested in the role of inhibition of apoptosis in steatotic livers after cold ischemia and warm reperfusion injury.

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Research Interests

My area of research interest is the brain and the biology of obesity using brain functional magnetic resonance imaging (fMRI) in American Indians to better understand obesity and food reward in the brain. During my endocrinology fellowship training, I used a rodent model to study the neurobiology of reward-based appetitive behavior. Now, I am also studying satiety and changes in incretin hormones within the context of differing macronutrient paradigms in pre- and postgastric bypass surgery patients, longitudinally. I also have a strong interest in type 2 diabetes, traditional Indian medicine, cross-cultural healing methods, and health outcomes. I am working on a secondary data analysis of the Strong Heart Study, which will be looking at culture and risk of type 2 diabetes in American Indians. Although my research during my endocrinology fellowship was basic science, now it is more translational or applied clinical research.

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Research Interests

My research involves patient-oriented investigations of hormonal mechanisms underlying cardiovascular disease risk; specifically, the roles of the renin-angiotensin-aldosterone system and insulin resistance in mediating vascular dysfunction.

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Research Interests

The overall goal of my research is to better understand the role of dietary and nutritional factors in the health and well-being of ethnically diverse populations. Current areas of research include the assessment of health, nutrition, and dietary status of population groups and relationships between diet, nutrient intake, health, and chronic conditions, particularly obesity, diabetes, and the metabolic syndrome. A particular area of expertise is the one related to the development and application of instruments and tools for dietary assessment.

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Research Interests

In type 2 diabetes, it has become evident that the main determinant for an individual to become diabetic is the ability of the pancreas to increase insulin production. The increase in insulin production results from an increase in the number of insulin-producing cells (β cells). The major interest of my laboratory is the investigation of the mechanisms involved with the regulation of β cell mass. We have generated genetically modified mice to study the role of β cell replication, neogenesis, and apoptosis. More specifically, I will study the mechanisms involved with the proliferative responses induced by Akt and the role of this kinase in the adaptation to animal models of diabetes. These experiments will elucidate new mechanisms involved with the development and/or cure of diabetes by augmenting our knowledge of the regulation of the life and death of β cells, a key factor for diabetes.

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Research Interests

My research interests include obesity and depression in African-American women. I am investigating the use of faith-based institutions to prevent and reduce the health risks associated with obesity. By providing culturally relevant health education programs in the community of the church, African Americans are empowered to change health behaviors and ultimately to reduce health disparities.

Alphonso Brown, M.D.

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Research Interests

I am a clinical translational investigator with an interest in the role of Angiopoeitin-2 in the pathogenesis of acute pancreatitis. I have conducted research in human, mouse, and cell culture models and demonstrated that Angiopoeitin-2 is critical to the development of severe disease in acute pancreatitis. I am now studying Angiopoetin-2's role in the development of acute pancreatitis in hopes of developing therapeutic strategies for this deadly disease.

I am a principal investigator (PI) on several active research projects, each of which examines a critical area of pancreatic disease:

(1) Evaluation of Early Refeeding in Severe Acute Pancreatitis: I serve as a co-PI for this NIH-sponsored multi-institutional study, which is designed to evaluate the role that various types of enteral feeding may play in improving outcomes in subjects with severe acute pancreatitis.

(2) Development of a Diagnostic Test for Early Chronic Pancreatitis Using Arterial Spin Labeling and Fatty Acid Analysis: This study, which is sponsored by the National Pancreas Foundation, is designed to pilot the development of a new diagnostic test for early chronic pancreatitis. This new test will make use of a combination of arterial spin labeled MRI and fatty acid analysis.

(3) Evaluation of Patient Quality of Life After Pancreatic Pseudocyst Drainage: This study will utilize the SF-12 to evaluate patient quality before and after drainage of pancreatic pseudocysts.

(4) Evaluation of the Ethical and Clinical Consequences of Testing for CFTR Mutations in Subjects With Recurrent Acute Pancreatitis: This study will examine the ethical and clinical/social implications of testing for heterozygous CFTR mutations in subjects with unexplained recurrent acute pancreatitis.

This body of work encompasses the sum of my research interests and demonstrates my multifactorial approach to the evaluation of pancreatic disease.

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Research Interests

I am a general internist and health services researcher with an interest in quality of care for older adults and underserved populations with diabetes and other chronic conditions. My work has focused on clinical-, health care system-, social-, and individual-level determinants of health for persons with diabetes. One project involved the development of evidence-based guidelines on care for older adults with diabetes. I am also working on projects to improve diabetes and hypertension self-management skills in older African Americans and Latinos with diabetes and to improve the detection and treatment of geriatric conditions among these patients. Another area of interest is how the built and social environments may influence the health of persons with chronic conditions.

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Research Interests

I have a wide range of interests that I am starting to narrow as I matriculate. My research interests include hypertension, chronic kidney disease, and hemodialysis access. I am applying for a project evaluating the effect of lower blood pressure on patients. I have been involved in projects looking for clinical association with central vein stenosis in patients on hemodialysis.

I have been involved with industry-sponsored research and have served as subinvestigator for projects evaluating anemia management and phosphorus control products. I am currently a principal investigator for an anemia therapy project.

In addition, I also am working on ways to improve the relationship between academic centers and the community. I have been working on descriptive projects for local communities and plan to advance into measuring the effect of community interventions on the participants.

Lynda M. Brown, Ph.D.

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Research Interests

As a postdoctoral fellow at the Obesity Research Center at the University of Cincinnati, I investigated the interactions among several key factors that determine whether or not animals become obese. These included gender (e.g., we have found that males and females respond differently to adiposity signals), dietary fat (e.g., we have found that rats maintained on a high-fat diet are resistant to the catabolic actions of insulin and leptin in the brain), and the presence or absence of specific genes important in the regulation of energy homeostasis.

One of my major areas of investigation was central insulin resistance caused by high-fat diets. I wrote a research proposal and subsequently received an award from the NIH to conduct these experiments.

The objective of the research I have initiated at the University of North Carolina at Greensboro is to develop an animal model of middle-aged humans, a time when estrogen levels decline in women and the incidence of obesity and its complications increases, and to evaluate fundamental questions related to body fat and sex differences. I will compare central leptin sensitivity in male and female rats that are middle-aged to determine the role of estrogen in determining visceral fat as well as the brain's sensitivity to leptin. These objectives will allow me to establish novel techniques to ask important questions of the association between aging, estrogen levels, and body fat as individuals end their reproductive capacity (mimicking menopause in women).

Terry A. Brown-Bryan, Ph.D.

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Research Interests

Insulin resistance (IR) has become a major public health concern for both developed and developing nations. Several reports support the strong association of insulin resistance with increased risk for the metabolic syndrome cluster of disorders, including obesity, cardiovascular disease, hypertension, dyslipidemia, impaired glucose tolerance (IGT), and type 2 diabetes. Although the factors responsible for the development of insulin resistance are not fully understood, it is recognized that both genetic and environmental factors contribute to its progression. My research interests are to further identify relevant genes that predispose individuals to insulin resistance and examine how biochemical factors, such as free fatty acids (FFA) and advanced glycated end products (AGEs), contribute to the development of IR. The long-term goal is to identify potential therapeutic targets for type 2 diabetes and its related complications in chronic kidney disease.

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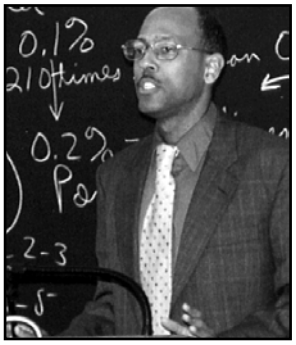
Research Interests

I am a social epidemiologist whose research examines the relationship between socioeconomic stratification, community social environment, psychosocial factors, maladaptive behavior, and health outcomes among underserved populations. A sociologist by training, I am well versed in quantitative and qualitative methodology and have specific expertise in race and gender health disparities. Currently, I am conducting a study funded by the National Heart, Lung, and Blood Institute focusing on understanding the relationship between social, economic, psychological, and behavioral factors and chronic kidney disease among African Americans. I also am a co-director for the community engagement research program for the Clinical Translational Science Award-focused partnership between Vanderbilt University and Meharry Medical College. In this role, I am charged with providing expertise on coalition building, community work, measurement, evaluation, and dissemination of results from community-engaged research projects at both campuses.



Gregory Wm. Buck, Ph.D.

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Research Interests

My research interests include: (1) global regulation of *Vibrio vulnificus* pertaining to pathogenesis; (2) analysis of health disparities between diabetic Hispanics and Caucasians in effects of MRSA colonization on amputation rates; (3) efficiency of Mexican herbal remedies on treatment of antibacterial infections; and (4) DNA repair in enteric bacteria and the evolution of general repair mechanisms throughout bacterial families.

Marco E. Cabrera, Ph.D.

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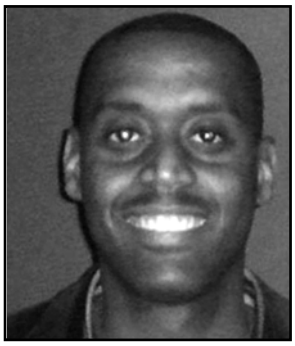
Research Interests

My main interest is to gain a quantitative understanding of metabolic regulation during conditions that challenge ATP homeostasis (e.g., exercise, ischemia, and hypoxia) to improve functional capacity in a variety of populations, such as astronauts, children with chronic disorders, and healthy sedentary/active children and adolescents.



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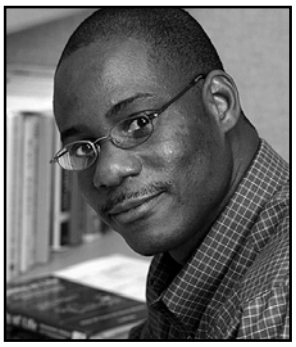
Research Interests

My current area of focus centers on the functional characterization of the glomerular slit diaphragm protein dendrin. We have demonstrated that dendrin relocates from the slit diaphragm to the podocyte nucleus in response to pro-apoptotic TGF-β as well as in a mouse model of anti-glomerular basement membrane glomerulonephritis. Our current work seeks to elucidate the mechanism of the nuclear import of dendrin as well as identify the nuclear targets that enhance the pro-apoptotic response. Given the correlation between a reduction in podocyte number (podocytopenia) and the progression of chronic kidney disease, we hope to identify specific molecular targets to tackle disorders that result in a compromise of slit diaphragm integrity and proteinuria.



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Research Interests

Currently, my research interests include the identification of the multidimensional burden of systemic lupus erythematosus (SLE) and lupus nephritis amongst cases compared to age-, sex-, and state-matched controls of the Carolina Lupus Study. My efforts continue to focus on the health-related quality of life, 5- and 10-year mortality rates, direct costs, and lost wages/work disability amongst participants of this prospective, inception cohort, which is comprised of individuals from the eastern counties of South Carolina and North Carolina.

Additionally, as an epidemiologist/biostatistician I am currently identifying the cardiovascular risk factors associated with specific outcomes to include mortality, health-related quality of life, and transplant surgery of the unique Sea Island SLE Gullah African-American cohort (SLEIGH Study), which includes age- and gender-matched related controls.

Hector Carbajal, M.D.

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Research Interests

My research interests include factors that relate to solid organ dysfunction and transplantation science. Most of my work has been centered at the clinical level. Replacing dysfunctional organs in people requires careful selection of candidates and careful application of multidisciplinary medical knowledge. This maximizes the function of the organ and the quality of life of the individual. Clinical trials and research are indispensable to consistently perfect what can be done for each individual patient and to do this in a safe and cost-effective way. Over the last decade, clinical transplant science has excelled at understanding how to achieve good short- and intermediate-term results. However, we now are trying to decipher what is necessary to attain better long-term outcomes.

Maria G. Castro, Ph.D.

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Research Interests

My research goal is to develop gene therapy strategies for the treatment of neuroendocrine disorders, such as pituitary disease, brain tumors, and chronic neurodegenerative disorders. My research group has developed novel gutless adenovirus vectors and has pioneered *in vivo* gene transfer into the pituitary gland and the central nervous system. I am particularly interested in understanding the cellular and molecular mechanisms that mediate long-term transgene expression and the immunological basis, which determines the interactions between viral vectors and their target tissues. I am also pursuing preclinical testing of these novel gene therapies as a prelude to clinical trials in humans.

I serve on the editorial boards of *Gene Therapy, Current Gene Therapy, Journal of Endocrinology, Journal of Molecular Endocrinology, Pituitary,* and *Journal of Neuromolecular Medicine*. I am a recipient of National Institutes of Health grants to develop novel gene therapy approaches to treat brain diseases such as Parkinson's disease and brain cancer. I have published more than 125 original research articles and have published in high-impact journals such as *Nature Medicine, Proceedings of the National Academy of Sciences of the USA, Nature Biotechnology, Endocrinology,* and *Journal of Clinical Endocrinology and Metabolism.*

Healani K. Chang, Dr.P.H.

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Research Interests

My research interests include the clinical and epidemiological study of insulin-resistance and cardiovascular disease risk factors among adult Native Hawaiians and Hawaii's other multiethnic populations. A new initiative proposes a patient-centric web-based diabetes program to improve glycemic control and reduce diabetes complications.

Raquel Charles, M.D.

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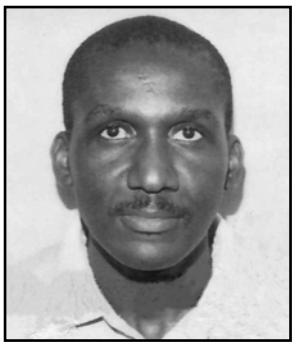
Research Interests

My research interests involve investigating racial/ethnic disparities in chronic kidney disease and include: (1) identifying provider behaviors that impact these disparities, and (2) developing interventions with the goal of improving kidney disease health outcomes among traditionally disadvantaged populations. The focus of my current research activities is ethnic/racial disparities in chronic kidney disease awareness and patient education.



Conrad R. Cole, M.D.

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Research Interests

My interest is in clinical nutrition and nutritional epidemiology research. I am specifically interested in the micronutrient status of preschool children because of the long-term effect of deficiencies that occur during this crucial period. I also am interested in understanding the clinical, metabolic, and molecular effects of bacterial overgrowth in children with a history of surgical short bowel syndrome to improve their nutritional status and overall outcome.

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Research Interests

My research interests include diabetes mellitus (DM) type 2 and obesity as it pertains to the Hispanic population and the genetics of diabetes mellitus type 2 and its complications in this segment of our population. Another area of interest includes the prevention and improvement of care in Hispanic patients with diabetes and obesity.

Deidra C. Crews, M.D.

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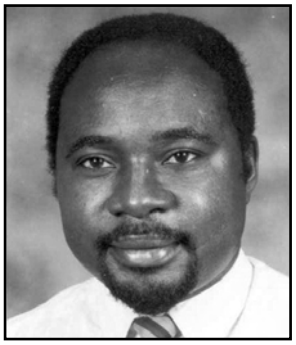
Research Interests

My research interests include the timing and location of dialysis initiation, dialysis modality choice, and disparities in chronic kidney disease prevalence and progression. I am particularly interested in the mechanisms through which socioeconomic, lifestyle, and behavioral factors might exert an effect on racial disparities in chronic kidney disease.



Samuel Dagogo-Jack, M.D.

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Research Interests

My laboratory has ongoing studies and collaborations in such areas as the pathobiology of early glucose abnormalities leading to prediabetes, the prevention of type 2 diabetes and the epidemiology of diabetes complications, and leptin regulation and its role in human metabolic pathophysiology.

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Research Interests

My research interest includes the role of insulin-like growth factors in breast cancer. The main interest of our laboratory is to evaluate the role of IGF-II in breast cancer development and the progression of metastasis. We have demonstrated that expression of IGF-II stimulates cancer growth and enhances the secretion of cathepsin D, an enzyme associated with poor prognosis in breast cancer patients. Of great interest is our recent observation that IGF-II is also important in the establishment of breast tumors. Breast cancer tumors can be developed in SCID and NUDE mice without the requirement of estrogen when the tumors secrete pro IGF-II. We are currently identifying the mechanism involved with this effect.

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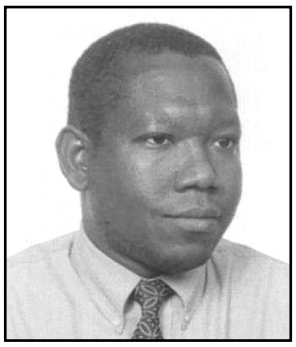
Research Interests

Currently, I am an Instructor in Medicine in the Renal, Electrolyte, and Hypertension Division at the University of Pennsylvania. I am interested in assessing the role of pulse wave analysis (PWA), for measurement of central aortic systolic pressure (CASP), in evaluating cardiovascular risk and renal disease progression in chronic kidney disease. One study I am conducting evaluates the effects of donor nephrectomy upon CASP. A second study, which is an ancillary study to the Chronic Renal Insufficiency Cohort (CRIC) study, will examine the ability of PWA to predict progression of renal disease in chronic kidney disease and its correlation with target organ damage in this population.



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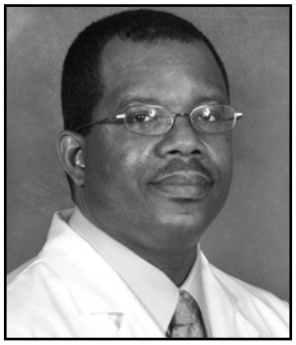
Research Interests

My research interests include the role of imidazoline compounds in type 2 diabetes and hypertension. By elucidating the signal transduction pathways coupled to I1-imidazoline receptors, we hope to gain insight into the mechanism by which imidazoline compounds lower blood pressure and exert antidiabetic effects.



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Research Interests

My research interests include outcomes following weight loss surgery and nonsurgical means of weight loss for morbidly obese patients. I am particularly interested in disparities in resolution of certain comorbid conditions, such as diabetes and hypertension, following surgical and medical weight loss.

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Research Interests

My main research interest involves the omega-3 fatty acid regulation of tumor-associated inflammation. The laboratory is focused on defining the mechanisms for n-3 lipid-mediated MAPK pathway regulation of proinflammatory cytokines and transcriptional factor activation.

My parallel focus is defining antiproliferative mechanisms for n-3 lipids in pancreatic cancer as stand-alone therapy or in combination with chemotherapy.

Jose R. Fernandez, Ph.D.

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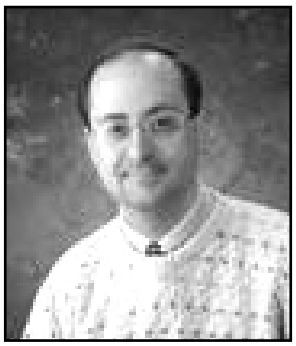
Research Interests

My principal research interest is the identification of genes that contribute to racial differences in obesity and metabolic outcomes using the genetic admixture approach as a tool to decompose the genetic, social, and cultural components underlying racial and ethnic trait differences. I also explore the impact of ancestral genetic admixture on quantitative metabolic traits in humans, and I helped develop new ancestry informative markers (AIMS) and analytical approaches for the measurement of admixture. I am also interested in the application of methods for QTL mapping; the use of linear statistical models to identify genes in the population, gene-gene interactions, and gene-environment interactions; and the use of statistical approaches to improve the identification of causal genes in the population.



Robert Ferry, Jr., M.D.

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Research Interests

My research is focused on diabetes melitus and its complications, the endocrine sequelae of childhood cancer, and growth disorders in children.

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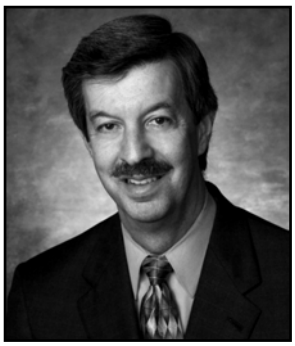
Research Interests

My research interest is in the area of energy metabolism. In particular, I am interested in studying animal models that can help us understand obesity, diabetes, and food intake. I study mammals that hibernate because they undergo dramatic body mass cycles that are primarily based on fat storage and utilization. In addition, I work on hormone cell signaling in fat and muscle cells because this is an important part of how nutrients are used.



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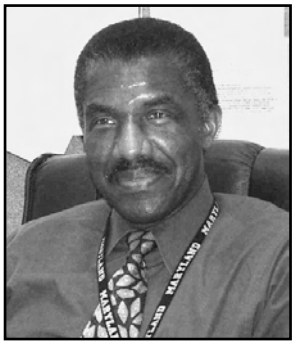
Research Interests

My research interests include excitation-contraction coupling in cardiac muscle and the effects of pharmacological interventions on the electrophysiology of isolated atrial muscle and the movement of calcium within the tissue. However, I have not been involved in research for many years, instead focusing my efforts toward association management and science policy.



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Research Interests

My interests are in prostate cancer and prostate biology. This research involves hormone regulation of gene expression in prostate epithelial cells and the mechanisms and regulation of Zn uptake by prostate epithelial cells.

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Research Interests

My research interests include the study of cardiovascular disease in chronic kidney disease (CKD) and the mechanisms of hypertension in CKD.

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Research Interests

I am working on cellular analysis assays to monitor immune tolerance in human organ transplant and autoimmune diseases

Tiffany L. Gary, Ph.D.

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Research Interests

I have master's and doctoral degrees in clinical epidemiology from the Johns Hopkins University Bloomberg School of Public Health and have experience in epidemiological research, clinical trial design and conduct, and medical claims data analysis, mostly in the disease area of diabetes. I have gained experience in applied epidemiology as a postdoctoral fellow at the Centers for Disease Control and Prevention. I have a particular dedication toward improving the health of ethnic minorities and focus my professional work around issues of minority health and social/environmental determinants of chronic disease. I have participated in various minority health training programs and volunteer activities and have conducted community-based research in African Americans with type 2 diabetes for the past 7 years. I have also participated in teaching efforts in the African-American community by helping to teach an introduction to epidemiology course at Tougaloo College in Jackson, Mississippi.

Sherita Hill Golden, M.D.

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Director, Inpatient Diabetes Management Service
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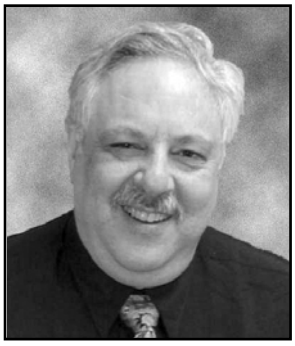
Research Interests

My primary research interest centers around identifying endocrine risk factors associated with the development of diabetes and cardiovascular disease through the incorporation of measures of hormonal function into the design of clinical trials of cardiovascular risk modification, observational studies of incident cardiovascular disease and diabetes, and studies evaluating diabetic complications. My current research focuses on studying the neuroendocrine response to chronic psychological stress as a risk factor for diabetes and cardiovascular disease. I am a former Robert Wood Johnson Minority Medical Faculty Career Development Award recipient, and my current research is funded through NIDDK.



Sidney H. Golub, Ph.D.

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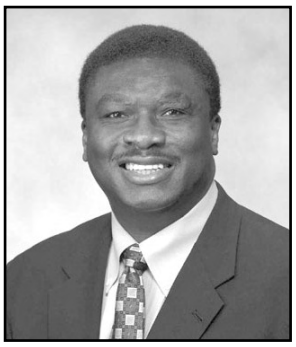
Research Interests

Currently, my interests focus on issues of science policy and research ethics. My laboratory research program has followed two closely related themes: the *in vitro* regulation of cytotoxic cells by cell interactions and regulatory cytokines and the *in vivo* expression of cytotoxic cell function in cancer patients.



Eddie L. Greene, M.D.

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Research Interests

My research interests include: (1) the pathophysiology of chronic kidney disease (specifically the biology of fibrosis inducing signaling cascades in renal tubule cells and in the renal mesangium), (2) the evaluation and management of cardiovascular co-morbidities in patients with chronic kidney disease, and (3) the pathophysiology of renal malignancies.

B. Michelle Harris, Ph.D., M.P.H., R.D.

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Research Interests

We recently completed a Robert Wood Johnson Foundation Active Living Research-funded project titled, "The Availability of Healthy Foods, BMI, and Dietary Patterns in Urban Adolescents." In this project, we examined the associations among adolescents' perceived and objective availability of healthy foods, the physical environment, and BMI. I also completed a study titled, "The Relationship of Low Birth Weight and Current Obesity to Diabetes in African-American Women." I will continue to explore the metabolic syndrome and will examine various approaches to reducing its negative impact on the health of minority populations. I have a strong interest in epidemiologic studies that may shed light on ways to reduce health disparities. Currently, I am working to expand research opportunities among undergraduate students in the areas of nutrition and related sciences.

German T. Hernandez, M.D., F.A.S.N.

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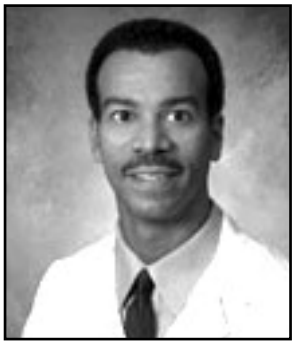
Research Interests

My main research interest is in health disparities in kidney disease among minority populations. I am focusing on environmental exposures (lead, cadmium, and mercury) as potentially modifiable risk factors for the progression of chronic kidney disease among Hispanics.

I am also interested in increasing the participation of Hispanic patients in therapeutic trials for glomerulonephritides.



Robert S. Hoover, Jr., M.D.

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Research Interests

I consider myself to be a molecular physiologist. My work currently focuses on regulation of the thiazide-sensitive sodium chloride cotransporter by phosphorylation. In general, I am interested in the molecular explanations of the physiology of ion transport processes.

Courtney W. Houchen, M.D.

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Francis and Malcolm Robinson Chair and Chief
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Research Interests

I am interested in studying the role of PGE2 signal transduction through PGE2 receptors in the modulation of the crypt epithelial cell response to cytotoxic and genotoxic injury. We are also interested in the role of PGE2 and PGE2 receptors in tumor initiation, progression, and response to radiation and chemotherapy.

Sergio Huerta, M.D., F.A.C.S.

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Research Interests

Our laboratory is investigating the pathways that lead to chemoradioresistance in rectal cancer. We have developed *in vivo*, *in vitro,* and *ex vivo* models of chemoradioresistance and have begun various radiosensitizing modalities to overcome such tumor resistance.

We are investigating apoptosis and hypoxia as possible mechanisms of action leading to a radioresistant phenotype with the goal of establishing a profile that could lead to appropriately selecting patients for neoadjuvant chemoradiation.

Ikhide Imumorin, Ph.D.

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Research Interests

Our interest in the epigenetics of metabolic syndrome stem from new methodological issues regarding the Mendelian assumptions of linkage analysis used in genome-wide scans for complex traits and the emerging area of intra-uterine fetal metabolic programming via nutritional effects on gene expression that might set the stage for the cluster of adult-onset diseases that underlie the metabolic syndrome. Our goal is to identify and characterize parent-of-origin effects in imprinted candidate genes and establish epigenetic associations between these genes and the metabolic syndrome using algorithms designed to test for imprinted transmission of disease alleles. In this regard, an R15 application for a pilot study is under development for submission to NIDDK next month to look at the epigenetics of Pdx-1, a gene highly expressed in pancreatic beta cells in the diabetic mouse, to ascertain if there are epigenetic changes in Pdx-1 and if so, if they are triggered by the onset of type-2 diabetes or vice versa.

We are also interested in exploring the genetic underpinnings of the disproportionate burden of metabolic disease in minority populations, especially American blacks. Essential hypertension (EH) is increasingly recognized as the archetypal polygenic disease of complex inheritance with a sexually dimorphic component. In this context, it is well known that males have higher blood pressures compared to females, possibly accounting for the higher prevalence of EH at an earlier age. Accumulated evidence in rats suggests possible modulatory effects of Y chromosome genes on the sympathetic nervous system, lipid metabolism, sodium intake and excretion, social stress and interaction with testosterone action, all with concomitant effects on the cardiovascular system. Even though several reports have been published on Y chromosome polymorphisms and their use in evolutionary characterization, there is very little published on the role of Y chromosome genes and how they interact with autosomal genes in the etiology of EH. We recently submitted a grant application as a subproject on an institutional NIH-RIMI grant to explore these relationships using family-based studies of polymorphisms in Y chromosome genes in a mouse model to be followed by analyses in a population-based human sample drawn from the Multi-Ethnic Study of Atherosclerosis (MESA) project.

Carlos M. Isales, M.D.

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Research Interests

Our laboratory is working to understand the hormonal links between nutrient ingestion and bone formation. We have identified several hormones of interest—in particular, glucose-dependent insulinotropic peptide, an enteric hormone that rises on nutrient ingestion and appears to be able to both stimulate bone formation and inhibit bone breakdown. We are using a variety of genetic models to study this link.

Leighton James, M.D.

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Research Interests

Work in my laboratory is aimed at understanding mechanisms that influence the development and progression of diabetic kidney disease. Hyperglycemia plays a pivotal role in the pathogenesis of diabetic micro- and macro-vascular complications, but is insufficient to account for all of the complications of diabetes mellitus. We, and others, have found that the hexosamine pathway may mediate some adverse consequences of hyperglycemia. Accordingly, one focus of our work is to determine the contribution of hexosamine pathway flux to the pathogenesis of diabetic kidney disease. To further explore these mechanism(s), ongoing research involves: (a) use of transgenic mice in which enzymes in the hexosamine pathway are targeted to glomerular cells (podocytes and mesangial cells) to study the role of the hexosamine pathway in modulating susceptibility to diabetic glomerulopathy and to ascertain how products of this pathway (glucosamine, N-acetyl glucosamine) may interact with cytokines like connective tissue growth factor (CTGF) to influence disease progression; and (b) utilization of *in vitro* cell culture approaches (MEF, MC, EC) to study signaling responses to high glucose and hexosamine.

A second focus in the laboratory is to study the role of key cytokines, like CTGF, in diabetic and hypertensive kidney disease. To accomplish this we, in concert with our collaborator at the University of North Carolina at Chapel Hill (Dr. Nobuyo Maeda), have developed mice and stable mouse embryonic fibroblasts (MEFs) that possess variable CTGF gene copy numbers.

Through the above approaches, we hope to determine how glucose disposal and cytokines like CTGF may contribute to kidney disease in diabetes.

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Research Interests

My research interests involve outcomes associated with the incidence and prevention of medication events within an acute care setting. I am also interested in pharmacists' interventions associated with the impact of patient care as a whole.

Ethan Kellum, M.D.

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Research Interests

The overall goal of our research is to elucidate the major factors that contribute to bone formation during growth, development, and aging to develop more effective preventative strategies for osteoporosis.

Nyingi M. Kemmer, M.D.

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Research Interests

My research focus is: (1) health outcomes of liver transplant recipients, (2) ethnic disparities in liver transplantation, and (3) health care utilization and access to liver transplantation.

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Research Interests

My major research interest is to study the biological mechanisms underlying differences in insulin sensitivity, body fat distribution, and other components of the metabolic syndrome among minority populations. Particularly, my interest focuses in understanding the role of adipocyte-derived proteins in the development of metabolic syndrome traits. We pursue this goal through extensive metabolic characterization, including euglycemic hyperinsulinemic clamps, nuclear magnetic imaging, and skeletal muscle and abdominal fat biopsies of individuals of different ethnic backgrounds.

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Research Interests

Our laboratory's focus is directed towards gaining a better understanding of mechanisms by which the immune system minimizes damage to self-tissues, a process called tolerance. In general, immune system tolerance is highly effective; however, the self-tissue damage that occurs in rheumatoid arthritis, type I diabetes, multiple sclerosis, and lupus is mediated by aberrant immune responses. Recently, a subset of immune system cells known as regulatory T cells has been shown to play a significant role in moderating immune responses. However, it is not clearly understood how variations in the environment where regulatory T cells develop and are activated influence regulatory T cell function. In addition, the ability of regulatory T cells to prevent autoimmunity, by migration to potential autoimmune tissue sites, is poorly understood. Current projects include: (1) the characterization of the regulatory T cell population in a mouse model where immune system damage to self-tissues results in death, and (2) the examination of intracellular processes occurring within regulatory T cells during effective immune regulation.

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Research Interests

We are investigating the molecular mechanisms of hormone action in the pituitary, with a special emphasis on factors controlling reproductive function. Current studies are focused on understanding the role of hormone action in regulating translation initiation and mRNA utilization. We are also interested in the mechanism of endocrine diseases affecting reproduction, such as polycystic ovary syndrome and type 2 diabetes. Our long-term interest is in understanding the integration of multiple hormone signaling pathways in the regulation of endocrine cell function.

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Research Interests

My research interests include mechanisms of regulation of sodium transport, specifically regulation of sodium-potassium-ATPase by calcineurin and by angiotensin II. I am studying how it regulates sodium transport. The ultimate goal is to understand how volume-sensitive hypertension is produced. I have a special interest in the pathophysiology of hypertension in African Americans, a population that has much more severe hypertensive sequella, including a very high incidence of end-stage renal disease. I am a coinvestigator of the NIH-AASK (African-American Study of Hypertension and Kidney Disease), which is studying the effects of different levels of blood pressure control as well as different classes of antihypertensive medications on the progression of renal disease.

Mary Frances Lopez, Ph.D.

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Research Interests

My research is focused on studying the intracellular mechanisms involved in insulin-like growth factor actions. The laboratory is currently examining the role of Igf2 deficiency in fetal carbohydrate metabolism and the mechanisms by which Igf2 affects neurodegeneration after injury. My research is currently being supported by the National Institute of General Medical Sciences.

Jesus M. Lopez-Guisa, Ph.D.

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Research Interests

Our laboratory's research focuses on the molecular mechanisms of renal interstitial fibrosis, particularly those changes occurring during the inflammatory and fibrotic stages. To study renal interstitial fibrosis, we use the unilateral ureter obstruction (UUO), Adriamycin, puromycin, and protein overload models; for diabetic nephropathy, the streptozotocin (Stz) and db/db models are utilized. We have established that Timp1 deficiency does not alter the degree of interstitial fibrosis in either the murine protein overload or UUO models, possibly due to a genetic redundancy with genes such as Timp2. Additionally, we have demonstrated the fibrogenic role of PAI-1 (plasminogen activator inhibitor-1), proving its importance as a fibrosis promoting gene. Similar results were observed in two diabetic nephropathy models (Stz and db/db) using PAI-1 +/+ and PAI-1 deficient mice. Recent results using PAI-1 ++/++ mice have confirmed the importance of PAI-1 in renal fibrosis; mice overexpressing PAI-1 developed significantly more fibrosis than their wild-type counterparts. We also have shown that the uPAR gene attenuates renal fibrosis, possibly mediated by a urokinase-dependent—yet plasminogen-independent—system. Our studies using uPA null mice showed no difference in the fibrosis level between wild-type and null mice. This raises the question of the role of uPA in renal fibrosis as well as its function in the absence of its receptor, uPAR, which may have antifibrotic properties.

We have demonstrated the importance of the gp130 family of cytokines during the renal inflammatory process, prior to the chronic fibrotic stage. Preliminary results indicate that gp130 functions in a profibrotic capacity as an "alternative" receptor for uPA in the absence of uPAR. Studies have been initiated on the IL6 family of cytokines and the metabolic syndrome, focusing specifically on the role of macrophages during the inflammatory process.

J. Ricardo Loret de Mola, M.D., F.A.C.O.G., F.A.C.S.

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Research Interests

My research interests include polycystic ovary syndrome, obesity, and lipids.

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Research Interests

My interests are in the area of Native American Traditional Medicine. I strongly believe that culture must be integrated into Western medicine. To me that means integrating cultural beliefs and practices into clinical medicine to form a more holistic approach to healing. I believe that clinical outcomes are strongly balanced with psychoneuroimmunology and that this can be demonstrated in all areas of clinical medicine. I am especially interested in the connection between Northern Circumpolar peoples and their relationship to Native Hawaiians and other Polynesian peoples.

José E. Manautou, Ph.D., A.T.S.

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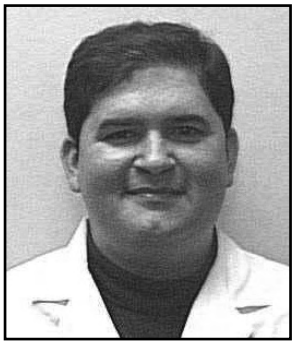
Research Interests

My research emphasizes mechanisms of toxicant action/interaction. Specifically, my research interests are in biochemical and molecular mechanisms of xenobiotic-induced hepatotoxicity. My laboratory studies the role of multidrug resistance proteins in the hepatobiliary disposition of toxicants and the changes in expression of transport proteins in response to chemical liver injury. My group also investigates the biochemical and genetic determinants associated with the hepatoprotective actions of peroxisome proliferators.



Jorge A. Marrero, M.D.

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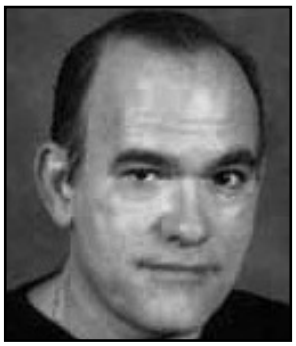
Research Interests

My main research interest is the early detection of hepatocellular carcinoma. I am studying novel biomarkers and am working toward validating them for clinical use. I am also studying the risk factors for the development of this tumor so that novel biomarkers can be applied to the high-risk groups.



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Research Interests

Research in my laboratory is directed toward elucidating the mechanisms of action of the vasoactive peptide angiotensin II (Ang II), and the growth factors insulin and platelet-derived growth factor, and how they regulate proliferation and differentiated functions of cells and tissues. The major focus is on the control of protein kinase cascades because phosphorylation is used repeatedly to regulate protein function.

Caroline B. Marshall, M.D.

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Research Interests

My research interests include cell cycle regulatory proteins and the initiation and progression of focal segmental glomerulosclerosis, and obesity-related glomerulopathy.

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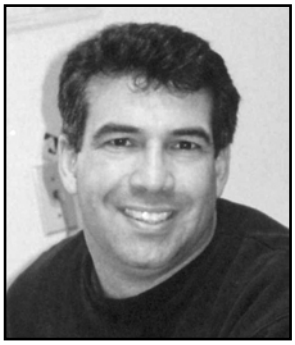
Research Interests

My laboratory is interested in understanding the significance of vacuolar type proton ATPases in angiogenesis, diabetes, and cancer. These pumps are typically located in acidic organelles. However, in highly angiogenetic and metastatic cells, they are expressed also at the cell surface. In diabetes and poorly metastatic cells, these pumps are underexpressed at the cell surface. We use fluorescence optical approaches to study the function of these pumps. For the experimental model, we used cell lines and animal models of angiogenesis and cancer.



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Research Interests

My research areas of interest include the uses of natural products in medicine. Current projects include the use of plant constituents for gastrointestinal health. We are interested in understanding the mechanisms of action of polyphenols and chlorophylls as cancer chemopreventive agents that reduce bioavailibility through the gut and lung. How do these chemicals interact with biochemical processes, and can they be used to treat diseases? We use a variety of techniques to study the use of natural plant products as both functional inhibitors and as gene expression modulators. I also run a program that tests chitosan formulations as hemostatic agents. These chitosan patches are used to stop severe bleeding and are currently used in battlefield medicine. A third line of research is the development of unique pH-activated peptides as delivery agents that will respond to the low pH found in tumors and will deliver macromolecules, which are useful in the diagnosis of and in therapeutic approaches for solid tumors.

Leon McDougle, M.D.

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Research Interests

I am very interested in promoting healthy lifestyles for urban communities and evaluating the outcomes of such efforts. I believe that lifestyle must be a focus of both the treatment and prevention of chronic diseases such as diabetes and hypertension. I serve as the PI for the Urban Diabetic F.I.T.N.E.S.S. Program (Fitness Improved Through Nutrition and Exercise Sustained by Support of Family, Friends & Community Partners). This is a 15-month study that evaluates the impact of social support on adherence to dietary and physical activity recommendations for 100 African-American diabetics.

I also serve the lower socioeconomic Near Eastside Columbus, Ohio, community as a family physician and volunteer Medical Director for the Central Ohio Diabetes Association's Near Eastside Healthy Lifestyle Center. The Near Eastside is 83 percent African American and has an age-adjusted death rate from diabetes that is double that of Franklin County. I aim to decrease health care disparities as a result of the above efforts.

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Research Interests

My research has two main research interests. The first is to study E6/E7 proteins of the high-risk human papillomaviruses (HPVs) that are associated with more than 95 percent of anogenital cancers. E6/E7 oncoproteins are consistently expressed in cervical cancer, and continued expression of E6/E7 is necessary for the induction as well as the maintenance of the transformed state. The main thrust of our studies is to determine chromosome instability and DNA repair mechanisms that are associated with E6/E7 protein's influence on cancer. A second interest of the laboratory is to delineate the function of genetic factors involved in diabetes, obesity, and kidney tumors.

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Research Interests

I completed my doctoral training in the Neurosciences Graduate Program at the University of California at San Diego. Through my dissertation research in Professor Jerold Chun's laboratory, I investigated the distribution of lysophospholipid receptors in the embryonic, neonatal, and adult mouse brain. The lysophospholipid receptors are members of a G-protein coupled receptor subfamily that bind either lysophosphatidic acid or sphingosine 1-phosphate with high affinity. These ligands act through their respective receptors to mediate inflammation, apoptosis, proliferation, and migration of diverse cell types. My work supports a role for lysophosphatidic acid and sphingosine 1-phosphate receptors in neurogenesis and gliogenesis in the brain as well as angiogenesis. My work also shows that lysophospholipid receptors are expressed at high levels in the kidney.

After completing my doctoral research work, I first completed a United Negro College Fund-Merck Postdoctoral Science Research Fellowship at the University of California at San Francisco in Professor Edward Goetzl's laboratory. My project involved a study of the subcellular trafficking of the sphingosine 1-phosphate receptor 1 in response to its native ligand and pharmaceutical drugs. I am currently engaged in postdoctoral training with Professor S. Thomas Carmichael in the Neurology Department at the University of California at Los Angeles. My project involves the use of laser capture microdissection combined with microarray analysis to detect genetic differences between brain regions that differ in their response to stroke. Stroke is the leading cause of adult disability in the United States. Individuals with diabetes have a higher risk of stroke. Studies suggest that the lipid signaling molecules lysophosphatidic acid and sphingosine 1-phosphate, acting through their respective receptors, may play a role in diabetes and kidney disease. For me, the study of diabetes and kidney disease represents a means to further my interest in lipid signaling molecules in development and disease. I also see the prevention and effective treatment and management of diabetes as a powerful weapon in the fight against stroke.

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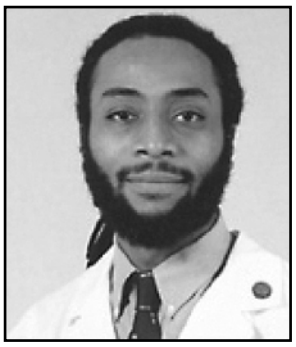
Research Interests

My interests include transcriptional control of gastrointestinal peptides and gastric and colon cancer, gastrointestinal inflammation, regulation of acid secretion, and regulation of gene expression through chromatin remodeling.



Bernard V. Miller III, M.D.

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Research Interests

There are known racial differences in the metabolism of glucose, lipids, and lipoproteins. The most important issues regarding increased body weight (obesity) are racial metabolic heteromorphy in free fatty acids and triglycerides. Obesity and type 2 diabetes mellitus are both more common in African Americans and are both associated with elevated free fatty acid and triglyceride concentrations. Paradoxically, African Americans have lower serum triglyceride concentrations than Caucasians. Adipose tissue lipolysis is lower in African-American women compared with Caucasian women and is a putative mechanism for increased obesity in African-American women. This does not preclude clinically important elevations in serum triglyceride and free fatty acid concentration in African Americans with obesity or type 2 diabetes mellitus compared to those without these illnesses.

Weight loss is the cornerstone of therapy for the improvement of the metabolic alterations related to obesity. Conventional low-fat or controversial low-carbohydrate weight-reducing diets both result in clinically significant improvements in both free fatty acid and triglyceride metabolism. In African Americans, weight loss efforts are more often less successful than in Caucasians; and the relative weight reduction is less even after gastric bypass surgery. Implementing weight loss programs in the community that work for obese African Americans is very important to combat the ill health effects of obesity, type 2 diabetes, and coronary heart disease that plague this segment of our community more than Caucasians.

Educating physicians on the racial differences in lipid metabolism and improving policy and treatment guidelines by altering the criteria for diagnosing dyslipidemia and the metabolic syndrome in African Americans may improve obesity-related morbidity and mortality in this population. I have devoted my research career to studying the physiology of weight loss and the racial metabolic differences that may influence body weight and the ability to reduce the body's fat stores. Effective treatment strategies for weight loss in obese African Americans and the education of providers and the public on the increased risk associated with "normal" lipid metabolism in African Americans are needed.

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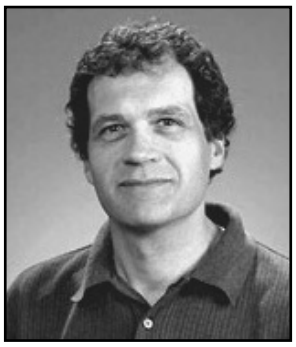
Research Interests

My work is focused on human and animal studies in obesity. Although it is well recognized that an excess of adipose tissue plays a causal role in the development of several diseases, the mechanisms that link obesity to comorbidities such as insulin resistance and type 2 diabetes are not well understood.

Adipose tissue-derived factors have been associated with oxidative stress, inflammation, and insulin resistance—disorders that are thought to be critical to the development of metabolic diseases. Plasma concentrations of such factors termed adipocytokines, for example, interleukin-6 (IL-6), tumor necrosis factor-alpha (TNF-a), leptin, resistin, and adiponectin, have been shown to be altered in states of insulin resistance and may have a direct effect on glucose metabolism and insulin action. Also, the relative roles of visceral versus subcutaneous fat in the pathophysiology of insulin action are not yet clear.

In our studies using severely obese women undergoing surgically induced or medically induced weight loss, we employ state-of-the-art techniques to determine relationships between measures of adiposity such as total fat mass, volumes of visceral adipose tissue (VAT) and subcutaneous adipose tissue (SAT), and systemic measures of adipocytokines. These longitudinal studies represent an excellent opportunity to determine associations between adipocytokines and insulin action. Also, this data will help elucidate which of the fat depots contribute more to systemic adipocytokine concentrations. In our studies we have shown that the etiology of insulin resistance and beta-cell function is strongly related to the localization and function of specific adipose depots, rather than generalized obesity. We have found that most severely obese patients are insulin resistant but have intact beta-cell function and that both parameters can be improved with weight loss. We demonstrated that following weight loss, improvements in insulin sensitivity were correlated to decreases in systemic concentrations of C-reactive protein, which suggests a link between insulin sensitivity and inflammatory stress. Also, we have shown that adiponectin, the anti-inflammatory and anti-diabetogenic cytokine, is increased during weight loss, and this increase is associated with improvement in hepatic insulin resistance. Current research is focused on the molecular changes in adipose tissue that modulate adipocytokine concentrations and influence systemic inflammation and oxidative stress in both human and animal studies.



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Research Interests

Diabetes and obesity are interacting complex diseases where the genetic and environmental factors control the development. We are using a different strain of congenic rats with the following natural mutated genes, Cckar, Lepr, and Gimap5, to elucidate the molecular mechanism of diabetes, obesity, and diabesity.

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Research Interests

My research interests involve signal transduction in the vasculature as it relates to cardiovascular diseases, atherosclerosis, and diabetes. We are currently studying the signaling mechanisms by which angiotensin II and other vascular pathogens, such as reactive oxygen species and lysophosphatidylcholine, lead to vascular insulin resistance. We are also looking at endothelial dysfunction and the role that thrombin plays in nitric oxide production.

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Research Interests

Our research interest is oriented at evaluating the prevalence of abnormal glucose metabolism (AGM) in young Hispanics with different cardiometabolic risk factors and identifying which would be the best predictors for it. Our preliminary data show that the prevalence of undiagnosed AGM is high (46%) in subjects with two or more cardiometabolic risk factors. We also have found that fasting blood glucose is not the ideal method for early identification of abnormal glucose metabolism in this high-risk population.

We are also interested in assessing potential racial disparities in the interaction between beta-cell function and insulin resistance (as assessed by oral glucose tolerance test-derived indices) among Hispanics, Caucasians, and African Americans.

Another research interest is evaluating the interaction between different cardiometabolic risk factors and the enteroinsular axis as assessed by basal and stimulated GLP-1 response during the glucose tolerance test.

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Research Interests

My research interests include diabetic nephropathy and other kidney diseases. My basic science work involves investigating and assessing the pathophysiologic mechanisms and morphometric analyses of diabetic nephropathy, with the goal of finding novel therapeutic targets. I am involved in engineering vault nanocapsules for drug delivery in the treatment of types 1 and 2 diabetic nephropathy and other kidney diseases. I also am involved in a genetic clinical study that identifies genes responsible for diabetic nephropathy and their linkage relationships to nephropathy and retinopathy in Mexican Americans and African Americans and in a project to assess the progression of diabetes in patients with end-stage renal disease.

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Research Interests

My research focuses on understanding the molecular pathways that allow leukocytes to traffic from the blood stream into the inflamed small intestine. We utilize novel models of inflammatory bowel disease, which uniquely develop chronic ileitis, reminiscent of human Crohn's disease (CD). Recent studies have shown that drugs that reduce excessive white blood cell traffic, like natalizumab, are effective to treat Crohn's. Yet on rare occasions there are serious complications, as we do not fully understand the drug's mechanism of action. Our long-term goal is to fully understand the trafficking pathways to the small intestine to find new therapeutic targets that may allow us to reduce leukocyte traffic to treat CD in an effective and safe manner.

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Research Interests

My research interests include the impact and outcomes of chronic kidney disease in African-American and Latino populations, the role of vitamin D and calcium management in chronic kidney disease, the mechanisms and epidemiology of hypertension and cardiovascular risk factors, the systems approach to and self-management of hypertension and diabetes, transcendental meditation in cardiovascular disease, and health disparities.

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Research Interests

I am a full-time clinician investigator in the Division of Gastroenterology at Children's Hospital Boston. My present research focuses on defecation disorders, esophageal motility problems, functional bowel disorders, and motility complications after gastrointestinal surgery. I have designed and conducted prospective randomized studies, including multicenter trials that have been funded by different institutions.

One of my aims has been to understand the mechanisms of fecal continence in children. To that end, I have studied and defined different aspects of anorectal and colonic function. I have also tried to understand the pathophysiology of gastroesophageal reflux and other esophageal problems. I have developed standards for the prolonged study of esophageal motility in children, and I am actively engaged in the study of non-acid gastroesophageal reflux and the implementation of impedance technology for the study of gastroesophageal reflux.

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Research Interests

Our research program currently examines the mechanisms that regulate endothelial cell-cell and cell-matrix adhesion during inflammation and angiogenesis. We have also identified important intracellular (endothelial cell) mechanisms that regulate endothelial proliferation and migration during angiogenesis. We are specifically interested in the role of intracellular oxidant generation and the effect of such oxidants on adherens junction proteins.

Secondly, we continue to examine mechanisms by which metastatic tumor cells detach from their primary location, circulate, and avoid death before implanting in a new location as a metastasis. My overall career goal is to develop a high-quality program in clinical translational research.

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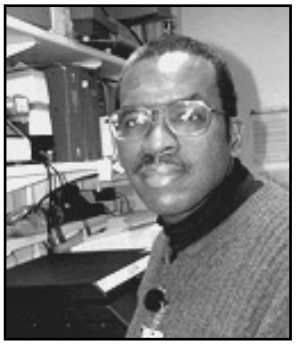
Research Interests

My main area of interest is liver disease, where I am currently working on an NIH-funded study looking at two genes of interest in liver cancer—Sulfatase 1 (SULF1) and Sulfatase 2 (SULF2). This study involves generating transgenic mice overexpressing the above genes and monitoring the respective effects on the development and progression of liver cancer in these mice. Besides further elucidating the role of these genes in liver cancer, we expect to generate enough data that will hopefully lead to effective chemotherapeutic modalities against this disease.

I am also interested in working on Hepatitis B and C viruses in the pathogenesis and progression of liver cancer with the aim of developing a cure for these viral infections and the cancers they cause. At this time I am involved in another study that will potentially better characterize the main markers for cancers of the liver. It involves comparing the standard marker (alfa-feto protein) with a relatively new one (Desgamma Carboxy Prothrombin) in liver-transplanted patients for cancer as compared with those with liver cirrhosis.



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Research Interests

Adeno-associated virus type 2 (AAV2) is a naturally defective human parvovirus that is being developed as a vector for gene therapies to treat diabetes and many other diseases. AAV2 requires co-infection with a helper virus, usually an adenovirus or herpesvirus, for efficient productive infection. It is, therefore, also a good model system for the study of virus-virus interactions. In the absence of a helper virus, AAV2 DNA integrates into the host genome with a strong preference (70%-90% of the time) for a 2-4 kb region of human chromosome 19 (the only example of site-specific integration in a mammalian virus system).

The long-range goals of my group are to understand AAV2's life cycle, with a special emphasis on the roles of the viral Rep proteins, and to use this understanding to exploit AAV as a gene therapy vector for chronic diseases such as diabetes. Our recent work has included characterization of AAV2-chromosome 19 integration junctions and the testing of AAV2-based gene delivery vectors in pancreatic islets.

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Research Interests

My research interests include the regulation of bone mass and metabolism by estrogens, the regulation of calcium handling in the kidney by estrogens, and the application of *in vivo* imaging to study the expression and function of specific molecules and disease pathogenesis.

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Research Interests

My research interests are to make advances in diabetic neuropathy research by understanding the mechanistic defect in microvascular dysfunction. We have made great strides in understanding the mechanisms involved in diabetic neuropathy and will continue to make advances by using innovative techniques and compounds to elucidate the specific physiologic pathways involved in the disordered microcirculatory system in diabetes. Continuous efforts to correlate microvascular dysfunction with the metabolic syndrome exercise and other disorders will help to develop novel treatments and behaviors to stop or slow the progression of diabetic neuropathy. In addition, continous efforts to incorporate studies that investigate cultural and socioeconomic disparities in African Americans will illuminate the causes of increased diabetic ulcerations and amputations in minority populations.

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Research Interests

My research focus is adipose tissue dysfunction in obesity and insulin resistance. My career development award project studies the regulation of adiponectin production and secretion in humans as it relates to insulin signaling in the adipocyte. I am also looking at the molecular signaling process involved in adiponectin secretion from 3T3-L1 cells in response to thiazolidinediones. In addition, I am interested in using a three-dimensional adipose tissue culturing technique to study adipose tissue function in lean versus obese humans.

Jon D. Piganelli, Ph.D.

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Research Interests

My laboratory studies T cell-mediated effector mechanisms of β-cell destruction in type 1 diabetes. Type 1 diabetes is an autoimmune process whereby T cells recognize pancreatic-cell antigens and initiate a leukocyte infiltrate that produces proinflammatory cytokines and reactive oxygen species (ROS), ultimately causing β-cell destruction. β-cells have a reduced capacity to scavenge ROS and are, therefore, very sensitive to their actions. My laboratory focuses on understanding how the generation of ROS intermediates in chronic inflammation leads to pathological states in inflammatory-mediated autoimmune disease. We are also interested in how the immune system uses the generation of ROS during immune activation to synergize the innate and adaptive immune response. Understanding how ROS facilitates the activation of the immune response allows us to exploit these pathways through therapeutic intervention.

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Research Interests

My research interests include the following three areas of study: Drug- and Cholesterol-Dietary Flavonoid Intestinal Absorption Interactions: The exposure of humans to dietary flavonoids, which can influence drug absorption by altering the P-glycoprotein (Pgp)-dependent or Pgp-independent transport mechanisms (drug-dietary interactions), is being studied. Also, because the flavonoids generally occur in plants, such as the glycosylated derivatives, studies will also be conducted with glycosylated flavonoids on Pgp-dependent and Pgp-independent transport. In addition to P-glycoprotein transport, I am investigating the effect of dietary flavonoids on cholesterol homeostasis by altering ABCA1, ABCG5/G8, and NPC1L1 transporters.

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Research Interests

My research interests include: ethnic identity and pain sensitivity, ethnic differences in pain sensitivity and diabetes self-management, chronic disease self-management, minority health disparities and public health policy, and cultural competence in health care service delivery and applied public health practice. My activities focus on ethnicity and pain and an understanding of the mechanisms of ethnic differences in pain responses by investigating perceptual and physiological responses to experimental pain stimuli in African Americans, Hispanics, and non-Hispanic whites.

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Research Interests

My research interests involve epithelial cell biology and neutrophil (PMN) migration. PMN migration is the immune system's first line of defense against infection, serving as a major component of the acute innate inflammatory response. When an inflammatory response is initiated at the epithelium, PMN must exit the bloodstream and traverse the endothelium, lamina propria, and tight junction to finally reach the lumenal side of the epithelium. PMN transepithelial migration is a multi-step receptor-mediated process and common in inflammatory diseases in several systems. In the gastrointestinal (GI) system, this primarily consists of Crohn's disease and ulcerative colitis. These are collectively referred to as inflammatory bowel diseases.

The pathology reveals large numbers of PMN located at the lumenal epithelial surface, presumably migrating into the intestinal lumen. These activated migrating PMN release proteases cause extensive damage to the surrounding tissue. Thus, dysregulated PMN transmigration likely plays a central causative role in the disease process. Therefore, we investigate the protein receptors that modulate neutrophil transmigration into the lumen of the gut. Currently, we have a particular focus on toll-like receptors and their interaction with DAP-associated activating proteins and how this interaction leads to PMN activation and migration. In addition, the epithelium also plays a role in efficient PMN migration into the intestinal lumen. Studies have shown that when exposed to inflammatory cytokines, the GI epithelium becomes more immunogenic, and PMN migration through this epithelium may be altered. Consequently, the primary focus of my research is to understand the molecular events that regulate PMN migration and the process of how the epithelium interacts with PMN to facilitate such migration.

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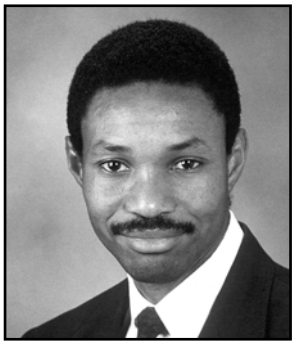
Research Interests

My major research interests include the study of plasma membrane cation transport systems as they impact upon the development of sickle cell. I have dedicated my career to investigating the mechanisms that mediate cellular volume regulation in sickle erythrocytes and the impact of the endothelium to these pathways. As an instructor in Pathology, I have published various articles that have contributed to the characterization of one of the major K+ transport pathways of erythrocyte volume regulatory system, which is of major importance in the pathogenesis of sickle cell. Furthermore, I showed for the first time the coupling of these transport pathways with plasma membrane cytokine receptors in erythrocytes and their contribution to cellular dehydration. These findings have facilitated the success of my NIH grants, an academic fellowship at Harvard Medical School from the Centers of Excellence in Minority Health and Health Disparities, and, more recently, an R03 grant award from NIDDK/NIH to explore the potential therapeutic benefits of receptor-mediated cell dehydration antagonists in transgenic mouse models of sickle cell disease. Furthermore, my expertise in erythrocyte biology and clinical chemistry have allowed me to develop protocols that can be easily used in population and translational studies using human red cells as *ex vivo* models of transport alterations in syndromes characterized by endothelial dysfunction such as sickle cell anemia, hypertension, and diabetes.



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Research Interests

Research in my laboratory is focused on the molecular pathogenesis of hepatocellular carcinoma. My current projects include the function of WW domain containing oxidoreductase, the FRA16D common fragile site gene, in liver carcinogenesis; cloning and characterization of genes at the sites of hepatitis B virus integration in hepatitis B virus-induced liver cancers; and modulation of heparin-binding growth factor signaling in hepatocellular carcinoma by the SULF1 and SULF2 sulfatases.

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Research Interests

Two of my research interests include the interaction of HIV and kidney disease; and the interaction of race, kidney disease outcomes, and geography. For unclear reasons, HIV-associated nephropathy is seen almost exclusively in African Americans, and the outcomes of these HIV-infected patients remain poor. We hope to characterize this population better from a standpoint of risk factors, delivery of health services, and outcomes. My second interest is to better characterize the renal health services provided in racially segregated areas. Despite similar insurance coverage, dialysis patients living in racially segregated areas seem to have different rates of transplantation, and the health services provided seem to differ in comparison to non-racially segregated areas.

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Research Interests

The main research goal of my laboratory is to define the signal transduction pathways involved with the regulation of cation transport mechanisms across the cell membrane as they affect human cardiovascular disease. The central hypothesis for our research is that cellular cation metabolism plays a major role in the pathophysiology of cardiovascular disease by regulating the production of reactive oxygen species, nitric oxide, and cellular volume. To this end, we are currently studying the role of cellular magnesium homeostasis in the pathophysiology of diabetic complications and the dysregulation of the renin-angiotensin-aldosterone system on the *in vivo* regulation of K+ and Mg2+ transporters. Furthermore, because of our expertise in cation metabolism in erythrocyte volume regulation and its role in the pathophysiology of sickle cell disease, we maintain a productive collaboration with Dr. Ronald Nagel, from the Montefiore Medical Center, with whom we are studying the *in vivo* role of nitric oxide on the Ca2+-activated K+ channel and the K+/Cl- cotransporter in mice and humans.

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Research Interests

My research interests include Barrett's esophagus, esophagus cancer, and genetic epidemiology.

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Research Interests

I have six primary research interests: (1) effects of the acute phase response (inflammation) on the dynamics and utilization of micronutrients—vitamins A and E and the minerals iron, zinc, and selenium; (2) development of animal models of acute and chronic inflammation using endotoxin or interleukin-6; (3) evaluation of nutritional indicators of vitamin A status in human populations; (4) development and evaluation of biomarkers of inflammation; (5) implementation and evaluation of community and clinical trials of micronutrient supplements; and (6) assessment and evaluation in infant feeding, including infant formula.

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Research Interests

My primary research focus is on cardiovascular disease in patients with chronic kidney disease, including dialysis and renal transplantation. Cardiovascular disease is the main cause of mortality in patients with chronic kidney disease, frequently before they develop end-stage renal disease. Therefore, detection of cardiovascular disease with non-invasive cardiovascular procedures such as electron beam computed tomography and carotid intima-media thickness is a primary focus of my research. In addition, there are likely factors unique to chronic kidney disease that may directly contribute to or increase the risk of cardiovascular disease such as vascular calcification and elevated levels of novel risk factors such as oxidative stress and inflammation. I receive funding from the American Heart Association, the National Institutes of Health, and the Veterans Health Administration.

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Research Interests

My research interests include diabetes research in children with type 1 and type 2 diabetes mellitus and educational tools for minority children and families to educate them about disease management and patient care. I am a certified diabetes educator and am bilingual.

Irma H. Russo, M.D.

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Research Interests

Primary prevention of breast cancer is the main goal of our laboratory. To accomplish this objective, we have focused on two main aspects of carcinogenesis: (1) the mechanisms that determine a higher susceptibility of the undifferentiated breast to be transformed by known or still-unknown carcinogens; and (2) the induction of differentiation as a physiological mechanism for inhibiting cancer initiation and progression. We have capitalized on the known fact that complete differentiation of the breast induced by the hormones of pregnancy reduces the lifetime risk of breast cancer and on the identification of a "window" of high susceptibility of the breast to be transformed by a carcinogen. This "window," which extends from the initiation of ovarian function to the first pregnancy, can be modified by endogenous influences or by environmental exposures during childhood and puberty. Thus, primary prevention of breast cancer requires the development of novel strategies based on an understanding of the normal physiological mechanisms that control breast development in their interaction with specific environmental exposures that could disrupt critical endocrinological pathways, leading to an increase in susceptibility or refractoriness to cancer initiation.

My laboratory's novel findings that a specific genomic expression signature in breast epithelial cells characterizes women who have given birth and that such signature is not present in women who never experienced a full-term pregnancy have served as the basis for studies designed for characterizing and validating the genomic signature of pregnancy, knowledge that will provide novel biomarkers reflecting the genomic and physiological changes associated with pregnancy with future applications to epidemiological research and chemopreventive interventions aimed at reducing the impact of breast cancer.

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Research Interests

My research interests encompass islet, acute pancreatitis, and allograft rejection studies. (1) Our center has isolated human islets from more than 350 cadaver donors to improve human islet recovery, engraftment, and functioning, with an emphasis on donor variables, isolation methods, and islet preservation. We have developed a culture media that can maintain human islet in culture for up to 2 months without compromising islet viability. We also have identified a gene expression profile that can predict islet function, with an interest in improving islet vascularization (angiogenesis) and suppressing host-specific and nonspecific immune response. (2) Regarding acute pancreatitis, we have studied the systemic manifestations of acute pancreatitis, particularly the effects of neutralization of TNF- with monoclonal antibody on the morbidity and mortality associated with acute pancreatitis. (3) Experiments to monitor allograft rejection in renal, pancreas, and islet transplant recipients have identified HLA-DRA mRNA upregulation as a marker for renal acute rejection; in addition, we have been the first to report the possibilities of using a noninvasive method to monitor the increase in T-cell activation markers gene expression as a marker of pancreas allograft rejection.

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Research Interests

Program of research focuses on improving health outcomes in the Hispanic population through (1) health promotion; (2) culturally sensitive interventions; (3) culturally centered health education to nurses, other health care professionals, and community lay persons; and (4) rigorous research. Other interests are nursing recruitment, education, and mentoring.

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Research Interests

My research focus is on the effect of stress on central nervous system (CNS) regulation of metabolism. Stresses such as hypoxia, hypoglycemia, exercise, and obesity all directly or indirectly alter CNS function and metabolism. Recent research illustrates that the CNS, which directly regulates food intake and body weight, can also directly regulate glucose homeostasis and may even be involved in the dysregulation that accompanies diabetes. My research suggests that glucagon-like peptide-1 (GLP-1) is an important CNS signal for regulation of glucose homeostasis. We are currently examining the neuroanatomy and signaling events that mediate these affects. Our data suggest an important role of CNS GLP-1 in regulating multiple facets of peripheral glucose homeostasis.

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Research Interests

My research has focused on several areas. As a trainee, I learned the basic tools of molecular biology research and began to investigate the mechanism of expression of the subunit of the pituitary glycoprotein hormones under the guidance of Dr. E. Chester Ridgway and his Ph.D. associates, Drs. William Wood and David Gordon. I collaborated in other projects within the laboratory, including the regulation of thyrotrope cell growth by thyroid hormone. I also have explored other areas of investigation, including the expression of the glycoprotein hormone alpha-subunit gene in solid tumors, specifically lung cancer. More recently, I have become interested in conducting clinical and translational studies in patients with autoimmune and drug-induced thyroid disorders.

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Research Interests

My studies focus on health promotion through nutrition and physical activity interventions to improve quality of life of older adults with and without chronic conditions (like diabetes and kidney disease), which result in frailty, disability, morbidity, and mortality. My research activities outreach to diverse populations disproportionally affected by health disparities, with particular emphasis on Hispanic Americans' health.

My research in nutrition has provided the evidence-based information used by the Academy of Sciences and the Institute of Medicine in setting the Dietary Recommended Intake for Protein in 2005. It has also constituted the basis for continuing research in this area nationally and internationally. My pioneering research on exercise and chronic disease prevention and management with emphasis in diabetes and kidney disease has been translated into clinical practice by the American Diabetes Association and adopted as guidelines on physical activity and diabetes.

I have many peer-reviewed publications in scientific journals. I lecture nationally and internationally and am a panelist on "Consejos de Salud," a weekly segment on health issues shown live on the Boston Neighborhood Television Network. I am an active member of the American Society for Nutrition, the American Society of International Nutrition Research, the Gerontological Society of America, the American Diabetes Association, and the Massachusetts Public Health Association; as well as a board member of various nonprofit and academic organizations.

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Research Interests

My main research interest is to study mechanisms that regulate gene expression. One of these mechanisms is DNA hypermethylation, which is an epigenetic event that inactivates gene expression through addition of a methyl group at the 5' carbon position of the cytosine base, and is catalyzed by DNA methyltransferases (DNMTs). In cancer, promoter hypermethylation is an important mechanism for transcriptional silencing of tumor suppressor genes. Additionally, I am interested in studying promoter regions to find regulatory sequences for two Sulfatase genes, SULF1 and SULF2. These sulfatases desulfate cell surface heparan sulfate glycosaminoglycans and regulate growth factor signaling. Further, I am interested in studying chronic hepatitis B virus infection and its association with liver cancer in recent African immigrants in the United States.

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Research Interests

The long-term goal of my research program is to understand the mechanisms governing mammalian pancreas and liver development, with the expectation that this knowledge will provide further insight into the origins of pancreatic and liver diseases in humans. For this purpose, we have selected to study the function of the mouse homedomain transcription factor Prox1, using various genetic and *in vitro* approaches.

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Research Interests

I am involved in clinical research in patients with hypertension and chronic kidney disease (CKD). We are currently examining the relationship between central blood pressure (as measured by the Augmentation Index and Pulse Wave Velocity) and proteinuria in patients with established CKD. Proteinuria in patients with CKD accelerates their risk of poor cardiovascular outcome. Our hypothesis is that the reduction in central blood pressure is what leads to the reduction in proteinuria and that addition of a second anti-proteinuric agent to the baseline/conventional therapy of Angiotensin Converting Enzyme Inhibitor (ACE-I) or Angiotensin Receptor Blocker (ARB) will act to further improve the outcome.

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Research Interests

My research interests include the pathophysiology of cognitive impairment in hepatic encephalopathy.

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Research Interests

For the last 6 years, I have been investigating molecular immunogenetics in colostrum from women receiving immunosuppressive agents. Comparing the differences, if any, in colostrum produced under immunosuppressive conditions can provide not only evidence to demonstrate the value and benefits or risks of breast-feeding infants that have developed in this same immunosuppressive intrauterine environment, but also provide insights into how these immunosuppressant drugs affect the immune system.

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Research Interests

My interests concern the population genetics analysis of complement regulatory genes in sickle cell disease. Their role in complement activation, disease pathogenesis, and severe anemia during crisis is a major focus of interest. An additional interest is to understand the pathogenesis of severe malaria infection alongside intra-ethnic and inter-ethnic genomic variability in the CR1 gene and the process of how this affects disease pathogenesis and outcome.

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Research Interests

My research interests are centered on low-cost sensors for point-of-care diagnostics. My group is working on various protein-based as well as polymer-based recognition elements for metabolites and other biomarkers. Our two projects that are of particular interest to the NMRI mission are: Binding proteins—These soluble proteins are being converted into optical sensors by mutagenesis and chemical labeling with fluorescent probes. The plan is to have a collection of these binding proteins to be used as an array or singly in various applications. Additionally, special sites for immobilization on a surface are being engineered on these proteins to preserve their activity. Low-cost metabolic monitor—A one-use, disposable device for use by soldiers in the field is being developed to measure glucose, glutamine, and lactate (USAMRMC-funded). A continuous version of this device is also being developed for diabetes care (NIDDK-funded). The optoelectronics of the sensor and the microfluidics for the sample cells are being optimized. Preliminary evaluation in comparison to commercially available glucose meters is ongoing. Application to monitoring nutrients in cell culture through a microdialysis sampling procedure provides close to real-time determination of glucose and glutamine and proof-of-principle that this method can be applied to diabetes care.

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Research Interests

I am an epidemiologist in the Department of Nutrition at the University of North Carolina at Chapel Hill. My research focuses on examining the causes and consequences of obesity and energy imbalance. I have conducted obesity-related data analysis using data from four large longitudinal datasets: the Atherosclerosis Risk in Communities (ARIC) Study, the Coronary Artery Risk Development in Young Adults (CARDIA) Study, the People's Republic of China (PRC) Study, and the Aerobics Center Longitudinal Study (ACLS). I have experience with anthropometric, diet, and physical activity data, as well as data examining several aspects of adiposity. I am currently investigating the associations between obesity and weight change and cardiovascular disease, diabetes, depression, hospitalizations, and all-cause mortality. I am particularly interested in health disparities research.

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Research Interests

My studies focus on how the cell cycle regulates liver cell proliferation. I am interested in understanding how quiescent hepatocytes reenter and traverse the cell cycle. We have two areas of study in the laboratory. (1) We are using large-scale siRNA screens to identify factors essential for hepatocyte exit from quiescence (G0-G1 transition). We have identified a novel cyclin and its associated kinase activity that is important during this phase of liver regeneration. (2) We also have developed a partial hepatectomy-induced liver regeneration model in zebra fish. We are performing studies to identify whether the proliferative cells are progenitor cells or de-differentiated hepatocytes. Using this model, we have identified a cell-cycle regulated protein, UHRF1, that is essential for liver regeneration. We are interested in identifying the molecular interactors of this protein and examining its role in liver development, regeneration, and hepatocarcinogenesis in both zebra fish and mammalian systems.

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Research Interests

My professional interests are (1) research: cardiovascular epidemiology, preventive cardiology, immigrants' health, and outcomes research; and (2) teaching: epidemiology methods and clinical epidemiology.

Ileana Vargas, M.D.

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Research Interests

I am currently interested in intervention and prevention strategies with respect to pediatric obesity and type 2 diabetes in youth.

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Research Interests

My interests include testing the environmental, physiological, and genetic variables involved in the development, maintenance, and reversal of obesity. I am currently involved in testing the roles of the melanocortin and sympathetic nervous systems in adipose tissue lipolysis.

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Research Interests

My major research interest is to understand the role of hemoglobin S and other variant hemoglobins in malaria chemotherapy. My research focus has been to elucidate the mechanism of action of antimalarials, such as artemisinin and new lipophilic iron chelators in sickle cell malaria. Other areas of interest include neurophysiology, electrophysiology, the patch clamp, neurodegenerative diseases, neurogenetics, neuropharmacology, and ion channels.

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Research Interests

My research is in the area of hemodialysis vascular access. My research interests involve the study of factors related to pre-dialysis arteriovenous fistula (AVF) creation, the relationship of AVF to cardiovascular complications among chronic kidney disease patients, and the association of thrombophilic and inflammatory mediators on AVF thrombosis.

Karol E. Watson, M.D., Ph.D.

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Research Interests

My research interests are: vascular biology, cardiovascular epidemiology, and lipid metabolism.

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Research Interests

My research interests involve the investigation of the epidemiology of racial and ethnic differences in chronic kidney disease. Specifically, my research focus has been on diabetic nephropathy epidemiology, disease progression, and disease management in systems where access to care is comparable. We have also been funded to investigate barriers to transplantation for racial and ethnic minorities and to develop culturally competent educational materials. I am also conducting research into the benefits of new home hemodialysis modalities such as nocturnal and short daily therapies.

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Research Interests

My research focus concerns improving the health of the Latino populations living with HIV/AIDS in the U.S.-Mexico border region. I apply the principles of community-based participatory research to partner with community agencies in my research projects.

Specific research topics on which I work include: HIV/AIDS stigma; health care access issues faced by persons newly immigrated to the United States; and health issues of persons living in the U.S.-Mexico border region, including binational access to health care for Mexican-origin persons living with HIV. In 2005, I received a 5-year Scientist Development Award for New Minority Faculty from the National Institute of Mental Health (K01 MH072353). I will study the barriers to recruiting persons living with HIV/AIDS into clinical trials.

My work also includes a study of barriers and facilitators to clinical trial recruitment in HIV-positive Latinos in the U.S.-Mexico border region; a prevention intervention study with HIV-positive persons in the University of California, San Diego Owen Clinic; and a binational U.S.-Mexico border study to identify health care access and utilization patterns among HIV-positive Latinos living in the U.S.-Mexico border region (NIMH 1R21MH084266-01).

National Institute of Diabetes and Digestive and Kidney Diseases
Network of Minority Research Investigators Workshop and Annual Meeting

Hilton Washington DC/Rockville Executive Meeting Center
Rockville, MD
April 24 - 25, 2008

THURSDAY APRIL 24, 2008

Welcoming Remarks

Dr. Ricardo Azziz, M.D., M.P.H., M.B.A., Professor, Department of Obstetrics and Gynecology, Cedars-Sinai Medical Center and Departments of Obstetrics and Gynecology and Medicine, The David Geffen School of Medicine at UCLA, Los Angeles, CA

Dr. Azziz, chair of the Network of Minority Research Investigators (NMRI), welcomed participants to the NMRI 7th annual workshop. The NMRI was established by the National Institute of Diabetes and Digestive and Kidney Diseases' (NIDDK) Office of Minority Health Research Coordination (OMHRC) to provide a communication network of current and potential biomedical research investigators and technical personnel from traditionally underserved communities. The major objective of the Network is to encourage and facilitate the participation of members of underrepresented racial and ethnic minority groups in the conduct of biomedical research in the fields of diabetes, endocrinology, metabolism, digestive diseases, and nutrition, kidney, urologic, and hematologic diseases. The Network also encourages participants, especially young investigators, in choosing and advancing their careers.

Dr. Azziz recognized the Planning Committee for its work in making the workshop a reality, and he reviewed the agenda and logistics for the workshop. In addition, he recognized NIDDK NMRI staff—Dr. Lawrence Agodoa and Ms. Winnie Martinez—who are responsible for creating and maintaining NMRI.

Lawrence Agodoa, M.D., Director, Office of Minority Health Research Coordination (OMHRC), National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK), National Institutes of Health (NIH), Bethesda, MD

Dr. Agodoa thanked Dr. Aziz for serving as chair of NMRI for the past year. He asked participants to introduce themselves and tell a little about their position and interests.

He emphasized that the workshop is an opportunity to network and meet people who can help you promote careers. He recognized those NMRI members who have received promotions or grants since the 2007 meeting.

Dr. Agodoa reviewed changes to the agenda and introduced the keynote speaker, Dr. Neil Powe from Johns Hopkins University Department of Medicine.

Keynote Address

From Rags to Riches: Rising from Academic Poverty to Academic Wealth

Neil R. Powe, M.D., M.P.H., M.B.A., Professor of Medicine, School of Medicine, and Professor of Epidemiology, Bloomberg School of Public Health, Johns Hopkins University, Baltimore, MD

Dr. Powe presented information on how to become "academically wealthy," based on his personal experiences that prepared him for his career. After a summary of the history, mission, and activities of the Welch Center for Prevention, Epidemiology, and Clinical Research at Johns Hopkins University (JHU), Dr. Powe presented his 10 rules for academic wealth and how to use the rules for academic success. He applied each rule to his own experiences as a model for those at the beginnings of their careers to consider as they pursue advancement.

Rule 1: Get on the right train

Dr. Powe described his childhood growing up in Philadelphia, and how he developed an interest in medicine as a career by seeing physicians provide care to underserved patients in the urban health clinics in which his father worked as a city employee. He described how he was fortunate enough to have family and mentors in school who encouraged him to pursue his interests. He attended undergraduate school at Princeton in 1972, which was the right train for him. Princeton was quite a change from the urban environment in which he grew up and the public schools he attended in Philadelphia. He had the opportunity to work with the late Harold Weintraub, M.D., Ph.D., a pioneer in molecular biology of gene expression, who excited him about science and was his advisor in the Biochemistry Sciences Department for his thesis on red blood cell differentiation. Dr. Powe also described a paper he wrote on health care for the underserved in a course that reaffirmed his observations on medicine before college and piqued his interest in population science and health disparities.

Rule 2: Follow your passion

During his time at Princeton and later at Harvard Medical School, Dr. Powe developed a passion for how to evaluate whether new innovations work in medicine, for whom, and under what circumstances. This led to a journey that included taking a year off from medical school to pursue coursework in clinical epidemiology at Harvard School of Public Health to determine if he could understand how physicians make the decision to use new and emerging technologies, and the evidence behind these decisions. He used this background when returning to Philadelphia for an internship and residency in internal medicine. Later, he became a Robert Wood Johnson Clinical Scholar at the University of Pennsylvania, where he took further coursework at the Wharton Graduate School and performed research on new medical technologies and new models of health care delivery, influenced by the late John M. Eisenberg, M.D., then chief of the Section of General Internal Medicine at the Hospital of the University of Pennsylvania.

Rule 3: Become a driver

This rule refers to the choices made independently after receiving a solid background education. Along with this strong foundation, Dr. Powe was attracted to join the faculty at Johns Hopkins where he could use his talents in medicine and public health.

Rule 4: Let important questions guide you

Dr. Powe explained how defining important research questions is critical to academic success. He showed how he asked important questions that led to a series of sentinel research studies that helped to define the new field of outcomes research.

Rule 5: Seize the moment
It is difficult to know at the time if opportunities presented to you are career-defining moments; this is easy in hindsight. This occurred for Dr. Powe when he arrived at JHU, attended a lecture at Grand Rounds on erythropoietin, and talked with the lecturer afterwards. It was this discussion that helped merge his passion and academic background. He conducted sentinel studies evaluating the effectiveness and safety of the new biotechnology, recombinant human erythropoietin, used to treat anemia in end-stage renal disease patients.

Rule 6: Understand the rules of the game
One of the most important rules for younger researchers is to understand the rules of the game in the institution. Publication is an important part of that game, and publishing with mentors and researchers esteemed in a field is very helpful. The goal is to create first author original research. Another important aspect is understanding how to present your ideas in writing and orally, thereby securing grant money. Another important aspect is sustaining research by collaborating with other investigators within and outside your institution. Dr. Powe provided examples of strategies that explained how the rules of the game can enhance an academic research career, leading to success. He used the example of the CHOICE study to show the progression of coming up with an idea, putting together a research team, securing funding, conducting the study, and ultimately publishing and disseminating the results.

Rule 7: Stay focused on the important
Staying focused on areas that are of interest and competency for a researcher allows one to increase his or her depth in a chosen field of study. Using the CHOICE study, Dr. Powe explained how conducting ancillary studies and publishing results allowed an in-depth exploration of fundamental relationships in the treatment of kidney disease patients; more than 40 manuscripts have been published in leading journals based on results of the CHOICE study. These studies have influenced medical practice.

Rule 8: Learn from sages
This rule speaks to the role of mentors in career choices and advancement. For example, mentors provide encouragement, instill confidence that you have their support, and believe in your abilities and that you will succeed. Effective mentors engage you in regular personal interactions and should meet with you in one-on-one meetings at least weekly. He said it is important to know that promotion is earned, not an entitlement that someone is guaranteed. Learn the value of being mentored and being a mentor. Dr. Powe learned to mentor early and has mentored hundreds of trainees and faculty who now are conducting pioneering research and have become leaders in their fields.

Rule 9: Don't take it personally
On a personal level, it is important to know that there will be bumps in the road. When you are turned down for your first grant, do not take it personally, but work to revise the grant and resubmit it. Seek advice from successful researchers in the field so you know you have a quality proposal. There are many people who will support you during failures, but it is up to the individual to accept failure, learn from it, and overcome it by trying harder.

Rule 10: Don't miss three pointers
This is a rule that speaks to importance of being a "real" person and spending quality time with family and friends. Dr. Powe described how he attended nearly all the varsity basketball games of his daughter and never wanted to miss her three-point plays. The strength for academic wealth one garners from family and friends cannot be replaced.

Note: Dr. Powe was the first African American in the 100-year of Johns Hopkins Medicine to be promoted to full Professor in the Department (he was the third in the entire School of Medicine). He also was the first African American to achieve the rank of full Professor in the Johns Hopkins School of Public Health. Just after the NMRI annual meeting, in recognition of his accomplishments, the board of trustees of the Johns Hopkins University appointed Dr. Powe as University Distinguished Service Professor of Medicine, an honor bestowed to only 27 individuals ever at the Johns Hopkins School of Medicine.

Overcoming Barriers to Minority Involvement in Health Research: Engaging and Educating the Minority Research Subject

Keith Norris, M.D., Executive Vice President for Research & Health Affairs, Charles Drew University of Medicine and Science, Lynwood, CA

Dr. Norris said there may not be one answer for overcoming barriers to minority involvement in health research, but his own experiences offer some strategies that have worked for many people. Five areas must be addressed to overcome barriers. They include understanding clinical research, concerns of not being a benefactor, communication (e.g., language and culture), research ethics/subject protection, and a sense of community in the academic community that allows trust.

A survey was conducted to determine the level of understanding and trust in research among minority communities. African American women (n = 8) participants had greater knowledge of research, followed by Latino men (n = 12), African American men (n = 8), and Latino women (n = 4). Shared motivators for participating in research and clinical trials included having a disease without a cure, helping a close family member, finding new cures for disease, staff from the same racial/ethnic group, childcare provided, transportation provided, and a limited number of visits required. There were different motivators among the African American and Hispanic groups. Shared barriers included fear of experimentation or harm, research for disease with current medications, transportation, lack of financial resources, time conflicts (e.g., work and family), need for childcare, and the number of visits required. Again, there were differences among the study groups. The survey showed that minority groups need to have barriers removed—and motivators encouraged—to increase the number of minority participants in research and clinical trials.

Strategies for educating minority communities about research exist if researchers understand the community. The most important aspect is communication; studies show that 48 percent of Americans cannot read well enough to understand a bus schedule. This is a clear message that medical information is not likely to be understood by most people. To a large extent, today's research addresses many of the barriers that the minority community has to participating in research, although researchers have not communicated the situation effectively. The key principle to remember is to convey information and confirm understanding.

It is important that minority communities participate in clinical research to reduce racial/ethnic disparities in health outcomes, to reduce gender/age disparities in health outcomes, to evaluate new approaches to improving health and health care systems, and most importantly, to improve the health of the community.

Academia and communities can develop partnerships to enhance the role of minorities participating in research. The primary challenge for developing these partnerships is the interface between academia and communities. A structure for addressing this challenge is Community-Based Participatory Research (CBPR), which according to the Kellogg Foundation is "a collaborative approach to research that equitably involves all partners in the research process and recognizes the unique strengths that each brings." CBPR projects are designed to provide a locus of control and collaborative ownership; leverages are built for ownership for actions, as well as promoting organic development of thought, building networks, and cultivating leadership. They must be built on respect and common values and purpose.

In summary, the following recommendations are suggested for creating and maintaining partnerships between academia and communities.

- Be thoughtful about the decision to partner, and ask who, why, and how.
- Use a memorandum of understanding to establish the partnership and use as the guiding principle for roles, responsibilities, and expectations and ultimately to reduce conflicts.
- Create an effective Community Action or Advisory Board, but recognize this alone does not establish a partnership.
- Continue to look for win-win scenarios and consider the potential long-term implications of early successes.

Minority Health and Health Disparities

Joyce Hunter, Ph.D., Deputy Director, National Center on Minority Health and Health Disparities (NCMHD), NIH, Bethesda, MD

Dr. Hunter provided background information on the NCMHD, which is one of the 27 Institutes and Centers (ICs) that comprise the NIH. NCMHD was established by Public Law 106-525, the Minority Health and Health Disparities Research and Education Act of 2000. Dr. Hunter mentioned that NCMHD has awarded grants to some of the NMRI attendees and encouraged other attendees to consider submitting grant proposals.

Dr. Hunter stated the mission of NCMHD, which is to promote minority health and to lead, coordinate, support, and assess the NIH effort to reduce and ultimately eliminate health disparities. In an effort to accomplish its mission NCMHD will 1) conduct and support basic, clinical, behavioral, and social science research; 2) promote development of research infrastructure and training; 3) foster emerging minority programs; and 4) disseminate information by reaching out to minority and other health disparities communities.

NCMHD also has as part of its mission the lead responsibility for coordinating the development of the NIH Health Disparities Strategic Plan. The NIH Health Disparities Strategic Plan's overarching goals include research, research capacity building, and community outreach.

Dr. Hunter then described the NCMHD research programs. In addition to its own research programs, NCMHD has had a long history of co-funding health disparities research projects selected for funding by other NIH ICs and federal agencies.

NCMHD is sponsoring a trans-NIH Health Disparities Summit called "The Science of Eliminating Health Disparities" on December 16-18, 2008, at the new Gaylord National Hotel in Maryland (see the NCMHD website at http://ncmhd.nih.gov/ for more information). The Summit will provide an opportunity to showcase grantees, supported by all of the NIH ICs, which are engaged in health disparities research.

Discussion

A participant asked Dr. Hunter to explain how to participate in the Minority Health and Health Disparities International Research Training Program. She responded that NCMHD issues an RFA, and any U.S. institution can apply. The research plan of the application must provide a detailed description of the research training program for the students at the U.S. institutions, as well as the research experience at the international site.

In response to a question about the Centers for Excellence, Dr. Hunter explained that under the P-60 awards an institution could develop partnerships; NCMHD does not dictate the scientific area, which makes it more flexible than other ICs. She strongly encouraged participants to consider submitting proposals to NCMHD. As a follow-up, a participant asked if proposals for the P-60 award are reviewed the same way as in other ICs. Dr. Hunter said they would be reviewed using the same basic review criteria that all NIH ICs use.

Parallel Interactive Workshops—Developing and Maintaining an Independent Research Program

During the parallel interactive workshop sections scheduled during the meeting, participants selected two of the following presentations to attend. During the scheduled time period, each workshop leader presented the materials twice.

Developing a Career in Academic Administration
Dr. Norris

The principles of running any organization—whether in academia or in another field—are the same. The mission of the organization does not determine how fiscally savvy and prudent an administrator needs to be. The academic world needs good administrators, but often, in academia, administrators are chosen because of connections rather than expertise.

Dr. Norris recommends that people interested in working in academic administration should earn a Master of Business Administration. He and others have found this degree very helpful because of the perspective it provides. Other participants in the session pointed out that degrees in educational leadership also are available.

Individuals who are considering an academic administrative position should seek out a mentor who can spend time talking about what the position entails, what skill sets are needed, and what additional skills the person considering the position may need to acquire. At a particular institution, there likely are to be certain committees that can provide important insights into how the institution operates and the roles of the individuals holding particular administrative positions. Serving on these committees is valuable. Understanding finance is important, so participation on a high-level finance committee may be particularly useful in helping a prospective administrator really understand the operations of an institution, and it can be a very powerful vehicle for positioning a person to be competitive for a future position. While determining what additional skills to acquire, the finance committee member is simultaneously meeting people who will be influential in determining who will be the next person in various administrative positions. Participating in such committees may also help some people to realize that administration is not for them, which is also a valuable lesson.

Moving into administration can have drawbacks. Sometimes, when a faculty member moves into administration, it can create hard feelings because people may think that the individual is looking for fame, power, or visibility. One's former faculty colleagues can become alienated. Faculty and administration are often seen as being at odds, with different priorities.

There is also an opportunity cost to being an administrator because it takes time away from other aspects of an academic career. One participant noted that it may be more difficult to make progress in research and obtain tenure if you have substantial administrative responsibilities. Another participant told the group that he had turned down an opportunity to be promoted from assistant to associate dean because it would have required increasing his administrative time commitment from 25 to 50 percent.

In response to a question about administrative career paths, Dr. Norris said that it is not necessary to be a department chair before becoming a dean. There are currently two tracks toward deanship: one through the roles of division chief and department chair, and the other through more specialized administrative roles, such as in medical education or financial administration. Increasingly, people are coming to the position of dean through the second path.

Maximizing Your Lab's Efficiency and Effectiveness
Carlos Isales, M.D., Professor, Department of Orthopaedic Surgery, and Associate Director, Medical College of Georgia, Augusta, GA

Dr. Isales conducted his breakout session as an open discussion, inviting participants to comment on their own experiences in setting up and running research laboratories. Many of those comments focused on personnel issues.

One participant noted that he had hired too many people for his laboratory in the first year and found that the laboratory worked more efficiently when he cut back to a smaller staff for the second year. Others drew attention to the difficulty of choosing good technicians. Several commented that having a good lead techni-

cian or laboratory manager is a key to success but that such individuals can be difficult to attract, particularly for researchers working at historically black colleges or other smaller institutions in metropolitan areas that also are home to larger universities or hospitals. One participant suggested that in such situations, it may be best to hire a less qualified technician, perhaps one with only a high school diploma, and train that person to the necessary level. Another participant complained that many technicians want to work in a laboratory only for a few years before attending graduate school or medical school, but another noted that such individuals often make excellent technicians for the relatively short time that they are available. Other personnel issues raised by the participants included the difficulty in recruiting personnel for laboratories that work on infectious diseases; the fact that some types of grants will not allow researchers to hire people who are not U.S. citizens; and the lack of graduate students at colleges that only teach undergraduates. Although undergraduates may have the potential to be good researchers, the short time in which they can participate in a research project may limit their usefulness.

In his comments and in written materials handed out at the session, Dr. Isales also focused on personnel issues, noting that the people hired for a laboratory can be both its greatest resource and its greatest impediment to progress. It often is difficult for a new principal investigator (PI) to make the transition from being a researcher to being a "boss." Hiring a key person (a senior technician) as the second-in command for the routine running of the laboratory is crucial. Training people for a laboratory is time-consuming, taking about 1 year, so it is best to avoid recruiting people who will only stay in the laboratory for shorter periods. Once people are trained, the PI should avoid micromanaging. Constantly looking over people's shoulders is generally a waste of resources.

Discussion participants noted that keeping the size of the laboratory small may sometimes be advantageous. In a large laboratory, the PI's time may be focused more on management and human resources issues than on science. One participant noted, however, that an advantage of a large laboratory is that laboratory meetings are more stimulating and intellectual. Dr. Isales recommended keeping the laboratory small at least initially since this approach provides the best opportunity to learn from mistakes.

Managing a Clinical Research Program

Glenn Chertow, M.D., M.P.H., Professor, Stanford University School of Medicine, Palo Alto, CA

Dr. Chertow provided insight into what he has learned about managing a clinical research program from the perspective of a young investigator who ended up managing his own program. Five aspects of management—managing yourself, managing others, managing time, managing expectations, and managing to stay sane—provided an outline for his advice. Above all, it is important to understand what factors were instrumental in causing someone to pursue a research career. Among those factors are altruism, idealism, and finance, as well as a sphere of influence for the individual. Understanding the factors that are personal to an individual allow them to manage themselves in their career.

Career decisions are difficult to make, and it must be understood that a research career may mean forgoing a career in clinical practice. Working for the MD degree, however, will allow many options and career choices. One way to view the difference in careers regarding the sphere of influence is to recognize that a clinician in private practice may influence the lives of hundreds of patients; the clinician educator in academia can favorably influence the outcome for thousands of patients; but the clinician investigator in academia can favorably affect the lives of all patients and have global reach.

The decisions made early in the career of a potential clinical investigator are far-reaching. Training during residency fellowships and choices of faculty positions must be made from the viewpoint of the ultimate career goal; these decisions must be well-thought-out and based on the best path to achieve career success. Remember that the "patterns you set are the patterns you live by" as the mantra for managing yourself. Other important dictums are to balance effort and expectation; do not promise what you cannot deliver, be careful not to bite off more than you can chew; and be a good academic citizen, but know when to say "no."

In managing others, there are three equally important spheres: those you work with, those who work with you, and those you work for. Interactions with people you work for should always include a focus on managing expectations, maintaining transparency, and keeping in mind the need to earn your independence. For managing those you work with, it is important to recognize competing priorities and stresses, consider the specific tasks and individuals' strengths and weaknesses, and realize that writing tasks may not be a strength for all those with whom you interact. For those who work for you, be deliberate when you hire; check references; make sure the position is sufficiently challenging; recognize that most research staff want to work harder than you think, as long as they are fully engaged in the work; and job satisfaction is related more closely to feeling part of something important, rather than salary, benefits, and scheduling.

Managing expectations and time also are important. It is important to recognize that others may have different priorities than you (e.g., family, children, and administrative activities), and that time deadlines need to be kept as a priority that adjusts to needs of staff.

Staying sane in the academic research setting is a function of individual adaptation to the pressures and occupational hazards (e.g., drug and alcohol use, depression, sleep deprivation, and chronic medical conditions) inherent in career choices. It is important to make time for one's personal life and to not be too hard on oneself; things sometimes go wrong or do not work out as anticipated. Although a career as a clinical investigator can provide intellectual stimulation, an opportunity to continue doctoring, a varied work experience, and a global sphere of influence, it is important to understand that management and leadership training for future roles in academic medicine are important.

Selling Your Science

Eddie Greene, M.D., Associate Professor of Medicine, Mayo Clinic College of Medicine, Rochester, MN

Dr. Greene began his presentation by saying that selling your science is one of the keys to the whole scientific endeavor. Scientists need to sell their work locally at their own institutions, in abstracts and poster presentations, in oral presentations at meetings, to grantors, to journals and book publishers, and increasingly, to the general public.

When communicating about your research, it is important to stay focused and develop a cogent theme (sometimes called a Single Overriding Communication Objective or SOCO); to learn and know your audience; to know your research discipline and subject matter; to prepare your presentation or grant application well to avoid major pitfalls and gaffes; and not to oversell or exaggerate your work.

One of the most important audiences to whom scientists need to sell their work is study sections and other grantors. A detailed, well-designed project plan is needed to convince potential funders to provide resources. A grant application should include a title; background information; an explanation of the significance of the work; the hypothesis; the objective; a description of the experimental design; and discussions of statistical analysis, data interpretation, and limitations or alternative approaches.

To review a grant application, reviewers need to be able to judge the inherent quality of the ideas, the investigator's creativity and ability, the proposal itself, and whether the idea is workable. Reviewers are looking for a plausible, logical, and testable idea that will make a significant contribution to the scientific literature. To obtain funding, investigators need to sell all of these aspects of their work and should realize that grant reviewers are usually assigned to review 10 to 12 grant applications, often while they are working on their own grant proposals. They do not have much time to spend on each grant application, so clarity of presentation, focus, the use of appropriate graphical aids, and the ease of reading are crucial. Grant applications may be "triaged" (evaluated as being in the lower 50% and therefore not reviewed in detail) because they are not important/significant, not logical, in need of extensive revision, overly ambitious, unfocused, not supported by preliminary data, or in need of additional preliminary data.

Much of the same information included in grant applications also should be included in journal articles. The Introduction of a journal article should clearly state the hypothesis and objectives, while introducing the topic but not providing a detailed review. The Materials and Methods section should be very specific, to facilitate replication by other scientists. The Results section should report only the critical facts and use graphical representations when appropriate. The Discussion should summarize the work and show how it fits into the larger scientific field.

Dr. Greene noted that investigators should not be offended by criticisms and comments received from journal reviewers or other scientists but should consider them valuable pointers on how to improve their ability to sell their science.

Lunch and Senior Mentor Roundtables

During lunch, workshop participants sat at a table of their choice to discuss specific topics of interest to them. The following topics were discussed by the listed topic leaders:

- Selecting and Being a Good Mentor
  Mario Ascoli, Ph.D., Professor, University of Iowa, Iowa City, IA
  Virginia Sarapura, M.D., Associate Professor, University of Colorado Health Sciences Center, Aurora, CO

- Picking and Building a Good Research Laboratory
  Healani Chang, Dr.P.H., Adjunct Associate Professor, University of Hawaii, Manoa, HI
  Dr. Isales

- Academic and Research Administration 101
  Sidney Golub, Ph.D., Professor Emeritus, University of California, Irvine, CA
  Evangeline Motley, Ph.D., Associate Professor, Meharry Medical College, Nashville, TN

- Networking/Collaboration
  Dr. Norris and Dr. Orhan Öz, M.D., Ph.D., Associate Professor, University of Texas Southwestern Medical Center at Dallas TX

- Finding Time for Family and Yourself
  Daisy De Leon, Ph.D., Associate Professor, Loma Linda University, Loma Linda, CA, and
  Ricardo Loret de Mola, M.D., Chairman, Department of Obstetrics and Gynecology, Southern Illinois University, Springfield, IL

- Developing an Academic Career
  Dr. Azziz and Dr. Greene

- Applying for Grant Funding/Interacting with NIH
  Judith Podskalny, Ph.D., Program Director, NIDDK, Bethesda, MD, and Rebekah Rasooly, Ph.D., Deputy Director, Division of Kidney, Urologic, and Hematologic Diseases, NIDDK, Bethesda, MD

State-of-the-Art Scientific Sessions

Recent Advances in the Genetics of Obesity and Type 2 Diabetes

Dr. Clifton Bogardus, Chief, Phoenix Epidemiology and Clinical Research Branch, NIDDK, Phoenix, AZ

Dr. Bogardus presented an overview of the NIDDK intramural laboratory and office in Phoenix. The Phoenix office was established as part of the NIDDK initiative to study the Pima Indians in the region. The Pima have the world's highest reported prevalence of type 2 diabetes (T2D); there is not a single reported case of type 1 diabetes (T1D) in this population. More than 50 percent of the population over 35 years of age is affected.

The most significant environmental factor for T2D among the Pima is the diabetic intrauterine environment. Studies conducted in the 1980s indicated that approximately 90 percent of the offspring of women with T2D go on to develop T2D. This creates a vicious cycle of women with diabetes having female offspring who go on to develop diabetes and have offspring who have an even greater risk of developing diabetes. Obesity also is a significant risk factor for T2D, and the Pima suffer from unusually high levels of obesity. There are major genetic determinants of obesity in this population.

At the beginning of the last century, studies using a human calorimeter conclusively determined that weight gain or loss is a function of the number of calories expended and the number of calories of intake. Since energy expenditure is highly correlated with body weight, people who weigh more burn more calories than those who weigh less. It is true, however, that there is significant biologic variation among individuals, and some people burn fewer calories than others of equal size. This variation in metabolism does not account for large variations in body weight, however.

Environmental differences can explain differences in weight between populations (e.g., Rwanda vs. Finland or Tokyo vs. Honolulu). Genetics, on the other hand, explain differences in weight within populations, as evidenced from studies of families, adoptees, twins, and monozygotic twins reared apart.

Genome-wide association studies (GWAS), making use of single nucleotide polymorphisms and linkage disequilibrium mapping, have made it possible to identify genes associated with complex diseases, such as obesity or T2D. Most of the GWAS have been conducted in Caucasians, and these results do little to elucidate genetic causes of diabetes among the Pima. Results from GWAS studies in the Pima have identified potential genetic differences that are associated with a higher risk of T2D, although more research is needed to develop practical applications of this knowledge to reduce an individual's risk of diabetes.

The fundamental problem of obesity and related diabetes is that they are conditions resulting from society having easy access to an abundance of food. It is difficult to stay in energy balance in this environment. Solutions include identifying genetic and molecular mechanisms of the inherent drive to eat; implementing early interventions in at-risk individuals with multifaceted treatments (e.g., combined and more effective drug regimens, lifestyle coaching, and better coverage by health insurance); and changing the obesogenic environment through public policy.

Genetics of Kidney Disease

Dr. Rasooly and Michelle Winn, M.D., Assistant Professor, Center for Human Genetics, Department of Medicine, Duke University Medical Center, Durham, NC

Dr. Rasooly provided her perspective on the genetics of kidney disease to give a sense of why researchers study genetics and what things can be learned. There are two types of genetics: (1) Mendelian genetics, where a mutation in a single gene is the primary cause of a disease or disorder, and (2) complex genetics, where variants in multiple genes each contribute to a trait, with cumulative effects. The National Library of

Medicine PUBMED Online Mendelian Inheritance in Man (OMIM: http://www.ncbi.nlm.nih.gov/omim/sites/entrez) website lists more than 100 genes associated with Mendelian kidney diseases. Some are relatively well-known (e.g., polycystic kidney disease [PKD]), while others are virtually unknown (e.g., familial nephropathy with gout). Some affect kidney function, whereas others affect both form and function.

The PKD story has validated the investments by NIH in genetic research on Mendelian diseases. Two of the more common of at least 57 inherited cystic diseases are Autosomal Dominant Polycystic Kidney Disease 1 and 2 (ADPKD1 and ADPKD2). The genes for ADPKD—PKD1 and PKD2—have been known for more than 10 years; the gene products are found in cilia at the apical surface of renal tubule cells. Other cystic diseases also have been found to have cilia defects, such as nephronophthisis, a rare pediatric cystic kidney disease that is caused by mutations in one of at least seven loci. Studies in zebrafish have confirmed the association of cilia defects related to cystic disease. The cilia are sensory organelles that connect various stimuli to mechanisms of cell-cycle control and epithelial cell polarity. There now is a unifying theory for cystic kidney disease that suggests that it is caused by defects in primary cilia or associated structures or signaling from the cilia. Thus, genetics has provided new clues about disease etiology, including the timing of the defect, and leads for possible therapeutics.

As noted in the studies described earlier by Dr. Bogardus on diabetes, understanding complex genetic diseases is difficult, since many variants contribute. NIDDK supports many research consortia that are attempting to accrue enough patients with kidney diseases to identify the underlying susceptibility and progression genes. A better understanding of the genetics of kidney diseases and associated factors (such as hypertension) at the genetic level might increase the ability to reduce the disease burden on individuals and society. Many ongoing studies are using a variety of molecular and genetic strategies to identify the variants that predispose an individual to severe kidney disease. GWAS (Genome Wide Association Studies) is a new approach that offers more opportunities to identify genes for complex traits.

Dr. Rasooly finished by speaking about the importance of studying genetics in families with rare Mendelian forms of diseases that are generally common and complex genetically, such as families with rare inherited forms of high blood pressure or Alzheimer's Disease. She introduced Dr. Winn for a presentation on the genetics of one such kidney disease, with both common forms that are genetically complex and rare familial forms with Mendelian inheritance: focal segmental glomerulosclerosis (FSGS).

Dr. Winn provided a pathological definition of FSGS and slides exemplifying characteristics of the condition. Subtypes of FSGS include primary (idiopathic), which is the most common; secondary, such as sickle cell disease, HIV, and heroin nephropathy; and familial. Among familial FSGS, autosomal dominant, autosomal recessive, and FSGS associated with congenital disorders (e.g., Charcot-Marie-Tooth and Laurence-Moon-Biedl syndromes) have been identified.

Based on the results of linkage studies, several gene regions appear promising for candidate gene analysis. For example, a mutation in the gene *TRPC6* was identified in a large family cohort with FSGS with a C-to-A heterozygous change in every affected individual but in none of the control individuals. The amino acid analysis indicated that proline had been changed to glutamine (i.e., Pro112Glu), and that a search of all available public single nucleotide polymorphisms (SNP) databases did not reveal evidence of this being a previously known variant. Subsequent studies of the TRP channel found that proline was conserved in various animal genomes and that subfamilies of TRP exist. In general, the gene is involved in protein-protein interactions. *TRPC6* is expressed in many tissues, including kidney.

Functional studies of *TRPC6* found that it is involved in calcium signaling and is responsive to angiotensin II (Ang II). Ang II, acting through its AT1 receptor, plays a critical role in the generation of proteinuria and progression of kidney injury, *TRPC6* is known to be modulated in a receptor-mediated fashion via DAG, and the AT1 receptor is known to activate DAG via the Gaq pathway. This results in increased calcium in the cell, which can be detrimental to cell health. Immunostaining indicates that there is more mutated *TRPC6* protein on the cell membrane than wild-type *TRPC6*, therefore allowing more calcium into the cell. Mouse

models also have been developed to test the hypothesis that *TRPC6*-deficient mice will be protected from kidney injury because of a decrease in injurious intracellular calcium signaling. Initial results from these experiments found that *TRPC6*-deficient mice do not have albuminuria or glomerulosclerosis; the absence of *TRPC6* had no detectable effect on the severity of Ang II-dependent hypertension, proteinuria, or kidney injury; and *TRPC3* and *TRPC7* mRNA expression is increased in the kidney and podocytes of *TRPC6*-deficient mice. Overall findings from these investigations suggest the possibility that inhibitors of *TRPC6* might have some utility in preventing chronic kidney disease.

Nutrition and Obesity

Carolyn Miles, Ph.D., Director, Clinical Obesity and Nutrition Program, NIDDK, Bethesda, MD

Dr. Miles presented an overview of the increase in obesity from 1985 to 2005 using Behavioral Risk Factor Surveillance System (BRFSS) data from the Centers for Disease Control and Prevention (CDC). The increase has been staggering from a public health viewpoint, with increases in almost every state in the United States. Also troubling is the increase in obesity in children and adolescents. A number of Institutes at NIH have an interest in conducting research on obesity. The NIH Obesity Research Task Force, with representation from 24 NIH Institutes, Centers, and Offices, produced the trans-NIH Strategic Plan for NIH Obesity Research to focus on research on prevention and treatment of obesity and on obesity and its associated health conditions. A copy of the plan may be downloaded from the following website: http://obesityresearch.nih.gov.

Studies were presented that suggest that fetal programming may play a role in the development of obesity and diabetes. The Agouti mouse model shows the impact of epigenetic influences (i.e., lack of methylation) on obesity. Infancy and early childhood studies have reported that energy intake and sucking behavior during a test meal at 3 months of age predict increased body size at 2 years; early childhood temperament/decreased sleep are associated with overweight; and rapid weight gain during early infancy is associated with the increased likelihood of obesity at age 20.

Recent clinical trials have shown that lifestyle modifications that lead to weight loss can reduce the risk of diabetes. For example, the NIDDK-sponsored Diabetes Prevention Program (DPP) randomized clinical trial reported a reduction in diabetes of 58 percent among participants in the lifestyle arm of the study; this compared to a reduction of only 31 percent in the study arm receiving the diabetes drug metformin. Other similar lifestyle intervention clinical trials have been as encouraging as the DPP in reducing morbidities with weight loss.

Ongoing trials are asking important questions regarding diet, weight maintenance, and diabetes. These include:

- Does intentional weight loss in diabetics reduce CVD events? (Look AHEAD trial)
- How can adults maintain weight loss? Can modern technology (e.g., the Internet) be an effective tool? (Weight Loss Maintenance trial, POWER trials)
- What macronutrient composition is best for weight loss maintenance? (POUNDS Lost trial)

One of the few long-term studies of bariatric surgery is being conducted in Sweden. Publication of results after 15 years of follow-up indicates reductions in weight and all-cause mortality after various bariatric surgery procedures; these encouraging results suggest that bariatric surgery may be indicated for some obese/overweight individuals, but more studies are needed to confirm these findings. A U.S. population study by Adams and colleagues reported that there were dramatic decreases in diabetes-related mortality among subjects who underwent gastric bypass compared to those in a matched control group who did not have this surgery.

Currently, NIDDK is funding the Longitudinal Assessment of Bariatric Surgery (LABS) observational study to investigate the long-term outcomes of bariatric surgery, including the resolution of diabetes. Genetic

studies will be carried out in the LABS cohort, and pre- and post-surgery blood serum and plasma samples will be available for ancillary studies. A parallel study in adolescents (TEEN-LABS) is being conducted in those 18 years and younger.

Dr. Miles discussed a recent program on *60 Minutes* describing bariatric surgery. A segment on the show indicated that bariatric surgery caused remission of diabetes in a high percentage of patients even before weight loss occurred. This is an area of future research interest for NIDDK and NIH. There are several theories generated from animal data on how bariatric surgery may affect diabetes, including one theory that proposes that the exclusion of nutrients from the proximal intestine exerts an antidiabetic effect (the Upper-Intestinal Hypothesis). There also is a Lower-Intestinal Hypothesis that proposes that bariatric surgery causes a quicker flow of nutrients to the distal intestine and causes a hyperstimulation of secretion of L-cell hormones. However, it is unclear how either of these bariatric surgery outcomes would affect diabetes. These hypotheses are intriguing, and NIDDK would like to better understand how diabetes is reduced in some patients who undergo bariatric surgery.

NIDDK has issued a Program Announcement (PA)—The Role of Gastrointestinal Surgical Procedures in Amelioration of Obesity-Related Insulin Resistance and Diabetes Independent of Weight Loss (R01)—to stimulate research in the area of diabetes and bariatric surgery. The PA encourages mechanistic investigations on why bariatric surgery influences diabetes and why diabetes resolution occurs in some people after bariatric surgery but not in others.

Data from the CARDIA epidemiology study showed more frequent consumption of fast food during early adulthood to be associated with increased weight gain over 15 years, and a decrease in physical activity is also thought to play a role in the increase in obesity in the United States. Another factor in need of further research is lifestyle related to the built environment, and whether access to parks, bike trails, and mass transportation has any role in obesity prevention. The National Heart, Lung, and Blood Institute (NHLBI) has initiated the *We Can!* program to study 500 communities for prevention of obesity among children. Information on the program may be found at http://wecan.nhlbi.nih.gov.

Dr. Miles also listed NIDDK programs that are related to nutrition, which may or may not include an obesity component. The NIDDK Division of Nutrition Research Coordination (DNRC), which advises on nutrition research issues and coordinates nutrition research and research training initiatives, was also discussed. You can learn more about the activities of the DNRC at http://dnrc.nih.gov/.

Case Study I: Stem Cell Policy, Politics, and Dollars

Stem Cells: Policy, Politics, and Dollars

Sidney H. Golub, Ph.D., Professor Emeritus, Department of Microbiology and Molecular Genetics, School of Medicine, University of California-Irvine, Irvine, CA

Regenerative medicine seeks to replace damaged cells and tissues with specific cell types derived from embryonic stem cells (or perhaps, in the future, with induced pluripotent cells from somatic cells). The use of embryonic stem cells is controversial because the cells are derived from human blastocysts (very early embryos) donated by couples using in vitro fertilization procedures that result in excess embryos destined for discard.

Science policy in the United States since World War II has been based primarily on a landmark report by Vannevar Bush, Ph.D., who had directed the U.S. scientific effort during the war. This report called for science to be supported throughout the country, for funding to be distributed by peer-reviewed merit, and for science to be insulated from political pressures. This has been the paradigm for science policy in America for about 60 years, but stem cell policy does not fit well into this paradigm.

In 2001, President Bush issued a well-known policy limiting federal funding for research using human embryonic stem cells to cell lines established before August 2001 (21 such lines are currently available). There is little federal legislation related to embryonic stem cells, except for an amendment to the annual NIH appropriation, called the "Dickey-Wicker" Amendment, which prohibits NIH funding from being used to create or destroy human embryos for research.

Because embryonic stem cell research is an emotionally and religiously charged issue, creating agreed-upon standards has been difficult. However, a variety of groups, starting with the National Academy of Sciences and followed by some state, international, and professional organizations, have done so. These groups have agreed on local oversight administered by Stem Cell Research Oversight (SCRO) committees, the need for knowledge of the provenance of cells and tissues, the requirement that genetic materials be donated altruistically, the prohibition of reproductive cloning, and the prohibition of the breeding of chimeras of mixed human and non-human origins.

Legislation to expand the number of stem cell lines permitted in federally funded research has been vetoed by President Bush. However, the scientific consensus is that human stem cell research should be performed and that new cell lines are needed. Public polls have shown that those who would allow stem cell research outnumber those who would not. However, emotions run high and much lobbying occurs. Supporters of stem cell research argue in favor of it on classic utilitarian ethical grounds: good will come from it, therefore it is good. Opponents see it as a right-to-life issue.

At the state level, policies vary greatly. Some states have legislation supporting human stem cell research, whereas others limit it or even impose criminal penalties. For example, experiments funded by the state of California could be prohibited and result in jail time for the scientist if performed in South Dakota.

Compromise will not be easily reached in development of a stem cell policy. The challenge of developing a policy is great because the science is rapidly evolving and because actions to regulate stem cell research are being taken at both the state and federal levels. Perhaps the most worrisome aspect of stem cell policy is that it represents a fundamental change in basic U.S. science policy. Since World War II, science policy has focused on determining the priorities to be funded. Now, with stem cells, there is a movement toward a new approach of legislating what types of science will be prohibited and punished.

Parallel Interactive Workshops—Surviving Academics

Surviving Academic Politics 101
Dr. Golub

Dr. Golub began the session by quoting a statement attributed to Henry Kissinger, among others: "Academic politics are so vicious because the stakes are so low." Dr. Golub asserted that the quotation was wrong: the stakes are actually quite high. Among the things at stake are research resources (including money, space, and core support; access to trainees; and access to collaborators); time obligations (for teaching, clinical care, and committee service); and decisions about the directions in which research programs will go. Surviving academic politics is very much a matter of interpersonal relations and skills, rather than following a guidebook.

Academics need to know who controls which resources at their institutions. Knowing the local culture is crucial; it can differ greatly among academic institutions. It is best to seek out those who really know the culture early in one's time at an academic institution and ask for their insights.

A researcher's natural allies in the hunt for resources include those who hired the researcher and the researcher's mentor, collaborators, and peers, both at the home institution and elsewhere. To use allies effectively, researchers need to find out who controls what resources, seek out those who can help, and ask

advice —from those who control resources, from peers, and from mentors. Obtaining input from staff also is valuable.

Dr. Golub referred session participants to a thought piece titled "Collaborations: With All Good Intentions," by Heidi Ledford, published in *Nature* on April 10, 2008 (Vol. 452, pp. 682-684), which discusses the potential value of creating the equivalent of prenuptial agreements among collaborators and ways to make sure that collaborations work by planning them in advance. The topic of collaboration also arose during discussion. Participants observed that although collaborations can be very productive, they also present a risk of misunderstandings, especially in collaborations involving researchers in different disciplines, where the cultures greatly differ. Several participants emphasized that it is important to put details in writing to ensure that all collaborators share the same understanding of the working relationship.

Another focus of discussion was the issue of when it may be right to leave an institution rather than stay. Dr. Golub pointed out that if the climate and culture are not right, working somewhere else might be better. He noted that people often focus on how to make their current professional situation a success without giving sufficient thought to the idea that a different situation might be better.

Another theme of the discussion was the difficulties postdoctoral fellows face in making the transition to being independent researchers. It was noted that postdoctoral fellows commonly believe that if they do good work, they can stay indefinitely at their current institutions. In reality, if they do good work in their postdoctoral positions, they will be qualified for good jobs elsewhere, but not at their current universities. Fellows themselves often do not appreciate that this is the case and that they will need to move to different institutions to continue their careers.

Balancing Your Academic Career: Fulfilling Teaching, Research, Clinical, and Administrative Duties

Dr. De Leon

Success in academic careers requires many professional skills beyond the bench and/or bedside. Scientists who love teaching and who have a passion for pursuing their own independent research should consider a career in academia. Before deciding on the academic route, scientists need to explore how much ambition, motivation, determination, and stamina they have. Balancing the responsibilities of teacher, researcher, clinician, and administrator is as challenging as it is rewarding. With these responsibilities come great demands, Dr. De Leon cautions, and potential academicians need to assess whether they are willing to pay the price. Academic scientists need to be capable of prioritizing and be able to penetrate into the heart of a problem. They must have high standards of professional integrity and be able to offer and accept criticism constructively. To be successful in academia, the scientist must be thick-skinned and be willing to persevere to achieve research goals.

Collaboration and teamwork are essential in an academic career. Faculty members need to be able to delegate assignments to others, even when it's hard to "let go" of projects. Sharing the credit for achievements with postdoctoral fellows and colleagues is integral to the mentoring responsibility. Dr. De Leon advises that the academic scientist must be a calculated risk-taker and be willing to seize opportunities. Whether presenting a poster, giving a lecture, or writing a scholarly journal article, academic researchers also must be effective communicators, able to explain concisely the results of studies. Writing grants that are funded and articles that are published in peer-reviewed journals are critical to success.

Creating a personal support team through networking enables young faculty to find resources and mentors. Dr. De Leon advised that finding a good mentor can mean the difference between success and failure.

Managing Your Academic Portfolio: Elements of a Good Dossier. A Pre-Tenure Check-up

Renty B. Franklin, Ph.D., University of Maryland, Dental School and Greenebaum Cancer Center, Baltimore, MD

Even though tenure is considered the big prize in academia, there are reasons not to be on a tenure track. Faculty may have greater professional mobility and be able to negotiate higher salaries if tenure is not being considered. Being on a tenure track can limit the development of teaching skills, as junior faculty are expected to concentrate on research rather than teaching.

Tenure was originally initiated in the 1940s with the development of the American Association of University Professors. The purpose of tenure was to guarantee academic freedom and to make the profession of university-teaching attractive to promising young scholars. If an institution has a 6-year probationary period for the granting of tenure, the tenure clock is actually shorter; a faculty member's dossier must be ready within 4.5-5 years.

The holy trinity of tenure pursuit and granting, Dr. Franklin explains, is teaching, research/scholarly activity, and service. Those pursuing tenure must always focus on optimizing their professional credentials. Obtaining extramural funding is important evidence of scholarly activity. Publishing manuscripts in high-impact scholarly journals is critical to achieving tenure.

Dr. Franklin advises faculty to not become overly involved in teaching until their research programs are established and funded. As educational responsibilities gradually increase, tenure seekers should document teaching effectiveness by accruing peer and students' evaluations. Joining professional societies and becoming involved in department and campus committees increase the likelihood of gaining tenure.

The tenure dossier must document the faculty member's performance in scholarly productivity, teaching, and service. Strong recommendations from the department chair and the appointments, promotions, and tenure committee; complete curriculum vitae; and an exhaustive statement of accomplishments are essential. Reprints of the most important journal articles published and objective measures of the articles' impact should be included. Evaluation letters from authorities in the same field, and evaluation forms from faculty colleagues and students, round out the dossier.

Academic Medicine Financing: How do we pay for it?

Dr. Azziz

Dr. Azziz noted that Cedars-Sinai Medical Center, where he is a professor, is the 10th largest independent teaching institution in the country, and he must understand a complicated financial system. He urged faculty to understand the financial frameworks of their academic centers and to follow where the money comes from. Medical schools' budgets have increased dramatically in the last several decades. In 1960, the average budget was $5 million, contrasting with the average medical school budget of $444 million in 2006. Today, academic medical centers are large financial enterprises supported by numerous funding streams, including federal and state monies, grants, technology transfer profits, and philanthropy.

As a result of the 1965 Social Security Act Amendments, which created Medicare funding for graduate medical education (GME), the number of medical schools increased from 86 to 125, and the number of full-time faculty increased from 11,000 to 90,000 between 1960 and 1995. The legislation reflected the belief that society should, in part, support the intellectual development of health care trainees. The most substantial funding is from Medicare's Direct Graduate Medical Education (DGME), which directly pays for resident and faculty salaries and covers about 60 percent of GME costs. Indirect Medical Education (IME) payments are calculated on an intern/resident-to-bed ratio and compensate teaching hospitals for higher inpatient operating costs due to unmeasured patient complexity and other costs associated with training the future healthcare workforce. Only hospitals are eligible for IME payments, so a medical school without a hospital, e.g., Case Western, cannot receive this funding.

Only the time that residents spend in patient care activities in the specific hospital may be counted for purposes of DGME and IME payments. The time that residents spend in didactic activities, such as attending lectures, or rotating through other hospitals cannot be claimed for reimbursement, creating a disincentive for allowing residents to train outside the academic medical center. Many teaching hospitals that care for a high proportion of uninsured and Medicaid patients receive an additional supplement, called the Disproportionate Share Hospital (DHS). States also support their medical schools but the funding is small, accounting for only 2-8 percent of budgets.

Other important sources of funding are medical students' tuition, federal and foundation grants, philanthropy, and royalties from patents held by faculty (technology transfer). Dr. Azziz advised the attendees to think about applying for patents as they conduct their clinical research. He relayed that an innovation developed at his institution, the Swan-Ganz catheter, is used to measure intracardiac pressures globally. The invention could have made the medical center millions of dollars in royalties. However, the investigators were so busy with their research that they forgot about filing for the patent and so lost any possible royalties to themselves and their institution.

Poster Session–Introduction and Overview

Eva McGhee, Ph.D., Assistant Professor, University of California, San Francisco, CA, and Dr. Öz

Drs. McGhee and Öz encouraged participants to attend the poster session at the close of the meeting this afternoon.

Dinner Address

Introduction of Dr. Vanessa Northington Gamble

Bessie Young, M.D., M.P.H., Associate Professor, Division of Nephrology, Department of Medicine, University of Washington, Seattle, WA

Dr. Bessie Young introduced Dr. Vanessa Northington Gamble, the dinner speaker at the NMRI Workshop. Dr. Gamble received her M.D. in 1983 and her Ph.D. in history and sociology of science in 1987, both from the University of Pennsylvania. She is currently University Professor of Medical Humanities at George Washington University in Washington, DC. In 1997, she was appointed to the Tuskegee Syphilis Study Legacy Committee. In 1999, she received the Robert Wood Johnson Investigator in Health Policy Award. From 1999 to 2002, she was Head of the Association of American Medical Colleges Division of Community and Minority Programs. In 2004, she became Director of the Tuskegee University National Center for Bioethics in Research in Health Care.

Dr. Gamble is the author of numerous articles and books, including *Making a Place for Ourselves: The Black Hospital Movement, 1920-1945*. Her research interests include the history of race and racism in American medicine; racial and ethnic disparities in health and health care; cultural competence; diversity; and bioethics

What Can Researchers Learn from the United States Public Health Service Study at Tuskegee?

Vanessa Northington Gamble, M.D., Ph.D., Professor of Medical Humanities, George Washington University, Washington, DC

Between 1932 and 1972, the U.S. Public Health Service conducted a study of untreated syphilis that was the longest non-therapeutic trial in history. The study involved 300 black men with syphilis living in Macon County, Alabama, who were not treated for their disease even though treatment existed in 1932, and highly effective treatment with penicillin became available during the 1940s. The researchers did not tell the participants

that they had syphilis; instead, their illness was described as "bad blood." The participants were given sham treatments, misled into thinking that some diagnostic and research procedures were actually treatments, and prevented from being treated for syphilis by other health care workers (for example, this occurred when some registered for the draft during World War II). The participants did, however, receive effective treatment for other ailments. The study ended in 1972, after a physician who had questioned the study in 1969 and received unsatisfactory answers from the government told the story to the news media. Even before that, the study was no secret; publications about it appeared in the scientific literature as early as 1936.

Lessons related to ethics and cultural competence can be learned from this study. The syphilis study researchers used incentives that were culturally competent and culturally sensitive. The study shows that although competence can enhance research, it also can be used against people, which is not acceptable. Dr. Gamble stated that, in her opinion, the study was unethical from the start. Some have argued that the study only became unethical when penicillin was introduced, but Dr. Gamble contended that it was always unethical because treatments for syphilis were available when the study began.

Lessons also can be learned about how people view their own—or their own culture's—actions as compared to those of others. After the Nuremberg War Crimes Trial following World War II, the Nuremberg Code was developed, which set standards for medical research, including voluntary consent, benefits outweighing risks, and the ability of subjects to terminate participation. The syphilis study was clearly in violation of this code, but those running it did not agree. When physicians involved in the study were later asked about whether Nuremberg made them reconsider the ethics of their own study, they responded, "They were Nazis. We are not Nazis."

The syphilis study also was in violation of ethical principles promulgated in the 1964 Declaration of Helsinki, which stated, "Concern for the interests of the subject must always prevail over the interests of science and society." Nevertheless, as late as February 1969, a panel from what was then called the Communicable Disease Center (CDC; now the Centers for Disease Control and Prevention) voted to continue the study on the grounds that there would never again be a chance to have such a study.

Positive outcomes of the syphilis study include the development of the 1974 National Research Act, which required the formation of Institutional Review Boards, and the 1979 Belmont Report, which called for autonomy, beneficence, and justice in medical research.

One disputed legacy of the syphilis study is its role in creating distrust of the medical profession and public health among African Americans and members of other minority groups. Historical research has shown that an attitude of distrust prevailed even before the study. For many African Americans, the syphilis study has become a shorthand reference for how they are treated today and were treated in the past; it authenticates long-held and entrenched feelings about medical racism.

In 1996, the Tuskegee Syphilis Study Legacy Committee was formed. Its goals were to persuade President Bill Clinton to publicly apologize for past government wrongdoing and to develop a strategy to redress the damages caused by the study and transform its damaging legacy. In 1997, President Clinton apologized on behalf of the nation in a ceremony at the White House attended by some of the eight surviving participants in the study. The last surviving participant died in 2004.

Dr. Gamble ended her presentation by emphasizing that the participants in this study, as in all human studies, were not merely research subjects; they were people with lives, families, jobs, and roles in their communities. This crucial fact was overlooked by the researchers who conducted the syphilis study.

FRIDAY, APRIL 25, 2008

Review of Day's Program

Sylvia Rosas, M.D., M.S.C.E., Assistant Professor, University of Pennsylvania, Philadelphia, PA, and Dr. Agodoa

Dr. Rosas announced the winners of the Poster Session. She thanked everyone who participated in the event, as well as the judges who gave their time and expertise and did such an excellent job. She welcomed Dr. Jennifer Deal to give the keynote address for the second day of the NMRI Annual Meeting.

Retiring the Generation Gap

Jennifer Deal, Ph.D., Senior Research Scientist, Center for Creative Leadership, San Diego, CA

Dr. Deal began her presentation on generation gaps by posing the question of which generation did participants think would like to be employed in a job with the following criteria:

- You are well paid
- You do interesting work
- You have the opportunity to advance
- You have the opportunity to learn and develop
- You have a supportive boss
- You work with peers and subordinates you trust
- You are treated with respect
- You have leaders who are credible and trustworthy

After providing data on generations, she said she would answer the question at the end of the presentation. Generations were surveyed using the categories of: Silents (born 1925-1945); Early Boomers (born 1946-1954); Late Boomers (born 1955-1963); Early Xers (born 1964-1976); and Late Xers (born 1977-1986). More than 6,000 survey participants were included. Dr. Deal characterized each generation by number of Americans in the group (Baby Boomers combined are the largest generation and the Silents are the smallest). It is likely that Generation Y (born 1987-2008) will surpass the Baby Boomers as the largest generation.

Ten principles drive motivation in every generation. These are:

Principle 1: All Generations Have Similar Values; They Just Express Them Differently
Principle 2: Everyone Wants Respect; They Just Don't Define It the Same Way
Principle 3: Trust Matters
Principle 4: People Want Leaders Who Are Credible and Trustworthy
Principle 5: Organizational Politics Is a Problem—No Matter How Old or Young You Are
Principle 6: No One Really Likes Change
Principle 7: Loyalty Depends on the Context, Not on the Generation
Principle 8: It Is as Easy to Retain a Young Person as an Older One—If You Do the Right Things
Principle 9: Everyone Wants to Learn—More Than Just About Anything Else
Principle 10: Everyone Wants a Coach

Dr. Deal focused on Principles 1, 2, and 4 to show that the generations are no different in their values but that each generation expresses themselves differently. For example, for Principle #1, the survey found that members of each generation valued family as the most important value from a list of 10 values. Policies that reinforce and align with the Top 10 Values can help improve employee satisfaction. It is important to

remember that values and behaviors are not the same thing—someone can behave very differently from you and still hold the same values. This was clearly seen in Principle #2. Each generation wants respect, but it is expressed differently by each generation. Younger generations find respect is listening to what they say; older generations find that respect is having someone do what they are told to do without question. Each generation finds it important to be respectful, but expresses it differently.

An interesting insight from the survey was the answer to the question about whether older and younger people want different characteristics in their leaders (Principle #4). The survey found that each generation wanted leaders who were credible, trustworthy, encouraging, and farsighted and who listened well. It is important that leaders have most of these traits, and organizations would do well to hire employees who exhibit these qualities.

In conclusion, the criteria listed above are attributes of a job people of all generations want. The results of the study show that the generation gap is in large part a creation of a media that does not understand that differences in expression of values do not mean that different groups have different values.

Dr. Deal encouraged participants to take part in the next phase of the survey by visiting the following URL: https://surveys.clearpicture.com/ccl.

The Role of Scientific Societies and Professional Organizations in Promoting Minority Research and Minority Investigators

Endocrine Society

Mark Lawson, Ph.D., University of California, San Diego, CA

The Endocrine Society seeks to promote diversity in the scientific workforce by providing assistance at all career levels. The Minority Affairs Committee (MAC) was commissioned in 1997 to specifically advocate ethnic and cultural diversity in the field of endocrinology by promoting the participation, visibility, and advancement of underrepresented minorities. The MAC advocates for ethnic diversity in both the membership and leadership of the Endocrine Society, develops targeted programs to increase the recruitment and retention of underrepresented minorities in the field of endocrinology, promotes the visibility and participation of underrepresented groups within Society programs and services, recommends and monitors appointment of underrepresented minority group members to serve in Society leadership positions, and encourages and supports initiatives that address diversity-related issues, such as health disparities, throughout the Society.

The Endocrine Society has developed a number of programs to increase ethnic diversity in the field of endocrinology. The Minority Access Program Pilot Initiative seeks to increase the numbers of minority researchers in the Society and in endocrine research by identifying students early in their undergraduate careers and encouraging them to participate in summer research opportunities at research institutions. MAC also provides support for travel to scientific meetings and mentorship opportunities at the annual Endocrine Society meeting. Exposing students to science early in their undergraduate careers is essential for building interest in pursuing graduate studies in the basic sciences. Through summer research opportunities, which are supported directly by the Endocrine Society, students are exposed to the field of endocrinology and to the Endocrine Society itself.

The Summer Research Opportunities Program, conducted in partnership with Federation of American Societies for Experimental Biology Minority Access to Research Careers, provides summer research opportunities to students who wish to participate in research but not necessarily in Endocrine Society educational programs. Whereas the Minority Access Program has students choose mentors from a defined group of training and recruiting institutions, the Summer Research Opportunities Program permits students to choose any investigator in the United States as a mentor.

The Clinical Practice Internship Program was launched in Fall 2007. Its goal is to provide medical students with opportunities to work in practice settings, particularly those in underrepresented communities, to encourage them to focus on endocrinology as a field of research or practice. A mentor database available on the Endocrine Society Web site assists students with identifying a clinical practice and mentor willing to work with them for a summer internship.

The Society also promotes the visibility of minorities in leadership roles. MAC has worked successfully to increase the number of minority speakers at the Endocrine Society annual meeting. MAC suggests minority members for Society Laureate Awards, encourages student to apply for awards programs, and helps host the Student Day program, which invites undergraduate students living in the annual meeting host city to attend the meeting. In addition, the Endocrine Society holds a minority mentoring reception to provide an opportunity to network with experienced faculty members and attend workshops. A minority trainee poster session and reception is held. The Clinical Endocrinology Update (CEU) Student Day Program at CEU meetings hosts high school students interested in science.

MAC can nominate investigators for leadership positions for various committees, offices, and councils. MAC's direct line to the leadership of the Endocrine Society allows the committee to promote the presence of underrepresented minorities and to protect the interests of these groups within the Society. MAC also has input into the development of the Minority Health Disparities Symposium, which is held annually and specifically addresses issues of health disparities in endocrinology. This symposium has successfully called attention to social and scientific issues related to the practice of endocrinology.

The Endocrine Society can provide young investigators with the opportunity to serve on Society committees and network with others in the field. The Society also provides travel grants and awards recognition to help investigators attend its annual meeting. At the mid-career level, the Society provides opportunities to mentor young scientists, and at the senior level, promotion of diverse leadership within the society will help achieve the goals of MAC and the Endocrine Society in increasing diversity among endocrine researchers.

American Heart Association

Daniel Lackland, Dr.P.H., Professor of Medicine and Epidemiology, Medical University of South Carolina, Charleston, SC

The American Heart Association (AHA) seeks to fund a broad range of successful research. The AHA has a national group and eight affiliates, each of which offers research funding. Funding research is a significant part of the budget at both the national and affiliate levels. The national group and two of the affiliates have two funding cycles per year and the other 6 affiliates have 1 cycle per year.

AHA focuses on funding young investigators with an interest in cardiovascular or cerebrovascular diseases, beginning with predoctoral funding (Ph.D. or M.D.); traditional postdoctoral funding also is available. The Beginning Grant-In-Aid provides funding to help promising young scientists from their first faculty appointment through assistant professorship. The Scientific Development Grant provides funding to bridge the gap between working as a trainee and working as an independent investigator; this grant is available to scientists who are no more than 4 years past their first faculty appointment. The Established Investigator Award supports mid-career scientists, from 4 to 9 years past their first faculty appointment through the assistant faculty level. The Fellow-to-Faculty Transition Award funds investigators during the transition from completion of research training to the early years of the first faculty/staff position; it is intended for investigators with no more than 5 years postdoctoral experience. The traditional Grant-In-Aid awards fund innovative research by faculty or staff pursuing independent investigations.

The AHA has recently initiated the Clinical Research Program, which focuses on translational research. This program encourages early career investigators to engage in introductory and pilot clinical studies of strategies to reduce cardiovascular disease and stroke. The program seeks to foster new research in the clinical and translational sciences and encourages community- and population-based activities. The program can provide

basic researchers with the opportunity to develop translational research activities. Another new grant, the Innovative Research Grant, can support innovative, high-risk/high-reward cardiovascular or stroke research; this grant is available to postdoctoral researchers at all career levels.

AHA also partners with a variety of minority organizations to increase minority participation in research. AHA has committed $236 million to minority research awards. The National Goal of the AHA is to allocate approximately 6 percent of unrestricted dollars to members of groups underrepresented in the medical sciences. AHA plans to develop minority supplements, similar to those available from the NIH, and encourages minority investigators to participate in its review of the grants it funds. The AHA website can provide information on available grants at both the national and affiliate levels.

The Minority Mentoring Program is designed to help early career minority clinicians and scientists in their professional careers; promote high quality science and practice in cardiovascular and cerebrovascular disease by encouraging participation by junior minority scientists and clinicians; and increase collaboration among basic, clinical, population, outcomes, and translational research in cardiovascular and cerebrovascular disease. This program provides junior investigators with opportunities to collaborate with senior investigators in the field. It also provides junior investigators with the chance to participate in the AHA and its leadership, including a 1-year Early Career Membership in AHA, complimentary registration for the annual meeting, and the opportunity to apply for travel awards. AHA matches applicants with mentors who will introduce them to other senior investigators and members of the AHA leadership. Ten junior investigators participated in the program in 2007, and AHA hopes to expand the program in the future.

American Society of Transplantation

Jerry McCauley, M.D, M.P.H., Professor of Medicine, University of Pittsburgh, Pittsburgh, PA

The American Society of Transplantation (AST) began in 1982 with the goal of including researchers in diverse fields who are interested in transplantation work. AST is an international organization of transplant professionals dedicated to advancing the field of transplantation through promotion of research, education, advocacy, and organ donation to improve patient care. AST includes cardiologists, transplant cardiologists and nephrologists, endocrinologists, immunologists, and others working on transplantation. Nurse coordinators are invited to AST meetings, and a parallel session for patients is held during the AST annual meeting.

AST has modest grants available for young investigators. Funding for research comes largely from pharmaceutical companies, foundations, grants, or patient donations. The grants are targeted and directed toward a perceived need, which is determined by the development committee. Grants are aimed at fellows and junior faculty members. They provide approximately $40,000 for 2 years. AST provides bridging grants for young faculty members who had an R01 but lost it because of strong competition for these grants. These AST grants are designed to help these faculty members continue their work and apply for another R01; particularly for physicians, who must take time from their research to provide patient care if they do not have research funding, these grants help investigators continue with their research. AST also partners with other foundations such as CHEST to provide research grants. Ongoing clinical science and basic science grants are offered every year. A women's and minority research grant was previously offered by AST, but AST received few applications for this grant, likely due to ineffective marketing efforts. If there is interest in such a program, AST may be able to offer these grants in the future.

The objective of all AST grants is to keep people working in research, specifically transplant research. A survey of AST grantees has shown that these grants are successful in allowing investigators to continue their research. The most recent survey of 117 fellowship and faculty grantees awarded since 1995 found that of the 87 who responded to the survey, 61 (70 percent) of these investigators continue to be active in the transplant field. Of these, 37 (61 percent) continue to work in basic research and have more time for research because of a lighter clinical care workload. Seven of these researchers work solely in clinical science, and 15 work in both clinical and basic science. Of the 61 respondents, 15 (21 percent) have received NIH funding. AST has successfully supported research in a specific area, but considers a broad range of projects for fund-

ing; for example, a connection to transplant science can be made for research in areas such as diabetes or health disparities research.

American Diabetes Association

Scott Campbell, Ph.D., Vice President, Research Programs, Alexandria, VA

The ADA focuses on a chronic disease that is disproportionately represented among minority communities. The role of the ADA is to fund research and also to involve the minority community in the organization itself. ADA provides volunteer leadership opportunities to the minority community and seeks to develop diversity on ADA national boards and committees, including grant review committees.

ADA seeks to strengthen math and science education in the United States. Recently, ADA has permitted any investigator with an ADA grant to request a student stipend that provides students with the opportunity to work in a diabetes research laboratory in the summer. This program is aimed at undergraduate students who are minorities, which ADA defines as Hispanic, Latino, African American, Native American, Native Alaskan, or Pacific Islander.

ADA also seeks to encourage minority investigators to pursue diabetes research, especially because this condition disproportionately affects minority communities. Involving minority investigators provides role models for the community. In addition, most diabetes clinical trials have not enrolled significant numbers of minority participants, and thus it is important to increase minority representation in the clinical trial research community. ADA provides training awards such as the Clinical Scholar Award, which provides medical, pharmacy, and other clinically oriented graduate students with a year to learn more about diabetes research. The Clinical Scientist Training Program provides 3 years of funding that can be used to earn a degree in an area complementary to the grantee's clinical degree, with the goal of developing translational researchers.

The ADA mentor-based minority fellowship program limits funding to minority fellows and their mentors who are U.S. citizens or permanent residents. This is an undersubscribed program, with only one-half of the funds available awarded. In contrast, ADA's regular mentor-based fellowship program provides grants to mentors, who may use this grant to fund foreign or domestic fellows. This will help develop an international cadre of diabetes researchers. Career development awards are available for junior faculty and investigators transitioning to true independence. The ADA is particularly interested in supporting physicians and clinicians who work with minority populations because diabetes is especially prevalent in some of these groups.

ADA has primarily funded basic science but seeks to increase its awards for clinical, epidemiology, and health care disparities research. To promote this, ADA has doubled the grant amount for clinical research awards to $200,000 per year for 3 years. Innovation awards, which provide $50,000 per year for 2 years, are available for pilot research and do not require large amounts of preliminary data. ADA basic science grants are aimed at young investigators. As a result of budget constraints, ADA's Research Policy Committee recently decided that ADA funding would not be available to investigators with $500,000 or more of individual funding. This is an interim measure until budget difficulties at the NIH are alleviated.

ADA provides opportunities for minority investigators through its undergraduate student stipend and minority mentor awards. ADA spent slightly more than $43 million on research in 2007 and has a new strategic plan to raise additional funds for research. In addition to its focus on young investigators, ADA has decided to increase its translational research portfolio.

Discussion

There is an ongoing discussion among researchers about the definition of translational research. Dr. Campbell recognized that it probably differs across the four groups represented in this session. Two divergent views define the translational research enterprise as "bench to bedside," or more troubling, "clinical trials into practice." The latter is where the most significant disconnect is seen. Even though clinical data on

diabetes treatment exists, and the ADA publishes clinical recommendations and guidelines every year as a supplement to *Diabetes*, only 50 percent of the people are being treated to the goal. To ADA, translation would be both bench to bedside and also health care delivery/disparity.

Dr. Lackland responded that AHA tracks translation quite intensely, because it is important to direct translation activities for NIH funding. AHA looks at those types of success rates of people who not only have chosen research careers but also have successfully competed for NIH funding.

The ADA's relatively new efforts on mentoring are being promoted through word of mouth, its websites, and through informing its funded investigators. Dr. Lackland said he would be interested in partnering with NIDDK for disseminating information to the community. Although the ADA has discussed its mentoring efforts with several Historically Black Colleges and Universities (HBCUs) and groups such as the Association of Black Cardiologists and the National Black Hispanic Medical Association, ADA's efforts are insufficient. Ideas about how to better disseminate this information are welcome.

Dr. Lawson said the Endocrine Society's Access Program began with campus visits to HBCUs and Hispanic colleges and universities to build interest in the program among minority students. The Society will provide support for minority students in the Program for at least 3 years by enabling their participation in society meetings and summer programs designed to build their interest in attending graduate school.

A participant pointed out that the definition of "minority" varies greatly. About 80 percent of ADA's minority support goes to Asian students, who are not disadvantaged in research. Dr. Campbell responded by explaining that the ADA is considering how best to address the high numbers of Asians who successfully apply for and receive research funding. One option would be to limit funding to U.S. citizen/permanent resident Asian Americans. Dr. Lackland added that this has been recognized at the AHA and there is a desire to find ways to ensure that research grants and mentoring opportunities exist for underserved minorities. Dr. Lawson said the Endocrine Society uses the NIH guidelines to define underserved groups. For example, Pacific Islanders, especially in the West, are considered to be underserved.

Parallel Interactive Workshops—Obtaining Grant Funding

Grant Opportunities within the NIDDK: Some Old, Some New
Dr. Podskalny

Dr. Podskalny presented information on new grant opportunities at NIDDK. Individual F30 predoctoral fellowships have been used by other Institutes within the NIH but are new to NIDDK. Students who are enrolled in a combined M.D./Ph.D. program and who are not supported by National Institute of General Medical Sciences (NIGMS) training programs can apply for these grants, which provide up to 6 years of funding for stipends, tuition, and fees; the medical school also is covered if the students are earning a combined degree. Of approximately 25 applications this year, about 20 will be funded.

Another grant new to NIDDK is the U34 (U indicates a cooperative agreement, which involves NIH staff more than R series grants). These are grants for planning large-scale clinical trials for which plans are already fairly well developed. The U34 provides funds for the planning stage so that the U01 grant, if approved, can avoid a long pre-recruitment phase. A U34 requires pre-approval; it precedes, but is not required for, a U01. The funds provided by a U34 can be used to create a research team, establish data management and oversight, define recruitment strategies, finalize investigators' brochures, write a manual of operations, establish a data safety monitoring plan, begin the institutional review board approval process, and work with the Food and Drug Administration if an Investigational New Drug (IND) application is involved. Funds cannot be used to gather preliminary data, conduct pilot studies, or design the trial. One advantage of

the U34 program is that it addresses the problem that grants are generally only awarded for 5 years, yet many clinical trials, including the planning stages, take longer. If the early phases of the trial are performed under the U34, the trial can likely be completed with 5 years of U01 funding.

R34 clinical trial planning grants are being awarded by NIDDK only for translational research for the prevention and control of diabetes and obesity. This grant is appropriate for researchers interested in community outreach, promoting healthy lifestyles, childhood obesity treatment, diabetes education and self-management, and health care management in underserved populations. It has been available for about 1 year, and several projects have been funded.

NIDDK has reduced its use of R21 exploratory/developmental grants. Instead, five NIDDK-specific program announcements (PAs) for pilot-feasibility grants in specific divisions are being funded.

Only two types of R03 small research grant applications are accepted: from those who have K03 or K23 grants (and this may be opened up to K1s this year) and for endoscopic clinical research in pancreatic and biliary diseases.

R56 grants cannot be applied for. However, some R01 applicants who narrowly failed to qualify for R01 funding may be awarded these grants to provide an opportunity to complete additional work that would make their R01 eligible for funding. Applicants must re-submit their R01 applications.

Old (but continuing) mechanisms include : F31 postdoctoral fellowships for minority students, F32 individual postdoctoral fellowships, T35 and T32 short-term training grants for medical students between their first and second years of medical school, the Medical Student Research Training program for medical students who want to take a year off from school to conduct research, K01 grants for Ph.D.s, K08 grants for physicians, K18 grants for stem cell researchers, K23 grants for clinical research, K24 grants for mid-career researchers, and K25 grants for mathematical or nonbiomedical researchers to apply their skills to a biomedical field. K99 grants, which fund work for a shorter period of time than the other K series grants, are the only grants for which non-U.S. citizens can apply.

Participants discussed R15 grants, which are academic research enhancement awards; these small grants are designed to fund research projects that involve undergraduate students and encourage them to continue to graduate school.

In response to a participant's question, Dr. Podskalny stated that most recipients of R01 awards have not received a K award; lack of a K award should not discourage investigators from applying for an R01 award. Dr. Podskalny added that participants could use CRISP (Computer Retrieval of Information on Scientific Projects) to learn about the types of projects that have been funded by NIDDK.

A participant asked about the Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) programs. Both programs provide research grants to small businesses for any project related to biomedical research. Many have involved the development of devices. The STTR program requires that the business partner with a university.

In response to a participant's question about the criteria for K24 mid-career grants, Dr. Podskalny listed a track record of mentoring, an ongoing patient-oriented research program, and national recognition as criteria; recipients must be associate or full professors. Most K24 recipients have never received an R01 grant, but many are awarded R01 grants while they have the K24 because they have time to write good grant proposals.

Taking Your Research from Scientific Curiosity to Grant Funding

Dale Abel, M.D., Ph.D., Associate Professor of Medicine and Biochemistry, University of Utah School of Medicine, Salt Lake City, UT

Dr. Abel took the viewpoint of a grant application reviewer in his presentation, pointing out features of an application that would make a good or bad impression on a reviewer.

Because of the current restricted funding situation, grant reviewers are placed in the position of having to distinguish outstanding grants from those that are merely good, and the latter will not be funded. Dr. Abel emphasized that preparing a grant application exceptional enough to have a chance of being funded takes time and advanced planning. Reviewers can identify hastily prepared applications and will not view them favorably.

High-quality preliminary data is important. There must be some basic data to support and justify the hypothesis. In some instances, there may be just one key observation, but it needs to be work that the applicant has performed, not just the work of others. Tables and figures should include appropriate footnotes and legends that provide the reviewer with adequate information for understanding the work.

Applicants need to know the funding interests of a particular funding agency to avoid wasting time on an application that will not be of interest to that funder. Dr. Abel recommends that applicants should review the funder's Web site to find the list of projects currently being funded, contact some of the researchers who are conducting those projects, and inquire about whether their own proposed work would be of interest to the funder.

The specific aims are the most important part of a grant application. If they make sense, the reviewer will want to continue reading. However, if the reviewer cannot understand them, or if the second and third aims are contingent on the success of the first, the application will receive a lower score. The aims should be hypothesis driven, and each should address a specific question. The aims should be related to each other, but each also should stand on its own.

The design of the experiment also is a crucial part of the application. If the approach is such that it will provide a definitive answer at the end, the project is more likely to be funded.

Dr. Abel recommends avoiding excessive jargon and abbreviations, and explaining things as clearly as possible. Sometimes, grant applications are reviewed by scientists who may be involved only tangentially in the applicant's field. Grant applications must be written to demonstrate clearly to non-experts that the project is compelling, its results would fill an important gap in knowledge, and the applicant is capable of completing it.

Preparing an NIH Grant Application and Budget

Lewis Roberts, M.B.Ch.B., Ph.D., Assistant Professor of Medicine, Mayo Clinic, Rochester, MN

For many investigators, especially junior investigators, preparing a grant application seems daunting. Reviewers will ask tough questions about grant applications, particularly with regard to the innovation and significance of the proposed work, how the researcher proposes to conduct the experiment, the logical flow, and the feasibility of the proposed work, including both the available resources and the qualifications of the researchers. In addition, reviewers want to know that new principle investigators have recruited collaborators with appropriate expertise.

To prepare a grant application, it is necessary to find the time to plan, think, and write. Since the instructions for grant applications change from cycle to cycle, it is important to read them carefully. One good way to get started on a grant application is to put together a draft hypothesis, specific aims, and key preliminary data and show them to mentors for input. Often, mentors will tell a new investigator that the proposal is too ambitious

and needs to be scaled down. Support staff can work on ancillary materials and the university's research services office can work on the face pages and budget while the investigator prepares the rest of the grant application.

The hypothesis is the driving force of a strong application. It is important to show how the proposed research will fill a critical knowledge gap. The hypothesis should be intimately connected to the aims of the work and should be kept simple and clear for the reviewer.

The abstract should be a well-written, self-contained summary. Dr. Lewis Roberts recommended writing or revising it last, even though reviewers will read it first, as ideas may have changed as the investigator prepared the application.

The list of specific aims is another key part of the grant application. It should consist of one page, with the aims (usually no more than three) organized in a sequential, numerical format. Limiting the focus of the aims is desirable; one common complaint about grant applicants is that they try to be too ambitious. In the description of the aims, preliminary findings should be directly related to testable hypotheses. Ideally, reviewers should think, "I wish we knew X," where X is what the investigator is proposing to do.

With regards to the Methods section, Dr. Roberts advised not including so much detail that reviewers lose sight of the aims. Methods should not be substituted for the hypothesis. With regard to the publication list that is included in a grant application, Dr. Roberts advised emphasizing original published or accepted manuscripts where the applicant was the first or senior author and only including publications relevant to the topic of the grant.

Obtaining Grant Funding from Foundations

Jeremy T. Miner, M.A., St. Norbert College, De Pere, WI

Grants are sponsored by federal, foundation, corporate, and individual entities, amounting to more than $300 billion of funding annually. From the private foundation's perspective, funding grants is an investment to close the gap between "what is" and "what ought to be." Foundations fund grants in an effort to solve specific problems, injustices, or inequities to fulfill part of their organizational missions. Grantees are seen as the means by which a foundation can achieve the ends that it cares about.

To establish a shared partnership with a foundation, the grantseeker should strive to understand the sponsor's values. The single best repository of information about all private foundations is www.FoundationCenter.org. With more than 90,000 foundations in the United States, this is a valuable tool for identifying funding resources. Another resource is FCOnlineFDNCenter.org, which requires a paid subscription. Every state has its own Foundation Center Cooperating Collection, which function as libraries of fund-raising resources. Other subscription databases include the Illinois Research Information System (IRIS), Sponsored Programs Information Network (SPIN), and the Community of Science (COS).

Using the key word "diabetes," a Foundation Center search yielded 357 foundations, with 52 foundations awarding more than $1 million. Of the 90,000 American foundations, 25,000 are considered large grantmakers. Within the last several years, there has been a dramatic increase in the number of foundations, with family foundations accounting for most of the growth. Baby Boomers who have amassed large sums of wealth and are close to retirement are creating family foundations to give back to their communities. According to Mr. Miner, many of these smaller family foundations have informal peer review processes, and are run by bank trust attorneys. Only 15 percent of all foundations have paid staff, which explains the lack of Internet addresses and websites for many.

Certain sponsors are focused on institutions, such as hospitals, health care facilities, or universities. A Foundation Center search using the key word "hospital" found 6,409 foundations, with 914 of these awarding more than $1 million in grants. The Robert Wood Johnson Foundation is the largest private funder of health care in the United States.

A four-step process for pre-proposal contact is the most important strategy to improve the odds of being funded. Before the planning and writing stages, the grantseeker needs to understand the sponsor's values and priorities. Assuming no prior relationship exists with a sponsor, the first step calls for writing to the foundation's program officer to request application forms and guidelines, a list of past grant winners, and a list of past grant reviewers. A letter sent on organizational letterhead is more likely to establish a relationship with the program officer than an e-mail or telephone call. The grantseeker can be oriented to a sponsor's expectations by calling a past grant winner and discussing their experiences with a particular grantmaker. Contacting a past grant reviewer and asking about the most common mistakes seen in previous grant proposals is the next step. Finding out specific details about the foundation's process for proposal evaluation also is useful.

A study of federal proposals revealed the most common reasons for proposal rejection are absent abstract or table of contents, no project evaluation plan, no resumes of proposed consultants or principal investigator, and un-numbered pages. Sponsors receive many more proposals than they can possibly fund. Unfortunately, the intellectual merits of many proposals are never even evaluated when they end up in the reject pile for failure to follow the foundation's instructions.

The last step in the pre-submission process is to call the program officer for information on the total budget, application/award ratio, recommended proposal model, and whether the grantseeker's project meets the foundation's current priorities. In the current competitive environment, proposals must be powerfully persuasive, addressing the sponsor's logical and psychological needs. Successful grant writers understand the sponsor's values and express that view in the proposal. Proposals that convince the sponsor that the grantseeker will be a good steward for their mission are more likely to get funded. Following submission, grantseekers should anticipate questions from the grant reviewers and be prepared to answer them. Grantseeker Tips are available on a complimentary, biweekly, online newsletter available at www.MinerAndAssociates.com.

Lunch Lecture—Developing a Research Program

Case Study II: Basic Research

Karl Nath, M.B., Ch.B., Professor of Medicine, Mayo Clinic College of Medicine, Rochester, MN

Note: Dr. Nath presented research findings that currently have been submitted to a peer-reviewed journal. He requested that his presentation not appear in this report until the manuscript has been accepted and published. At that time, a link will be added to this report for readers to access this information.

Mock Study Section Review

During a breakout session, participants attended one of the Mock Study Sections. Leaders of the session were provided with sample grant applications (some from meeting participants) to review and provide critical feedback. The Scientific Review Officer (SRO) led a discussion of the feedback sessions. One of the most useful activities during the session was the grading of the sample applications by "study section" participants, with direct feedback on why they would have scored the application as they did. The four study sections were comprised of the following Chair and SRO.

Mock Study Section 1—Chair: Dr. Isales
SRO: Michele Barnard, Ph.D., Scientific Review Officer, NIDDK, Bethesda, MD

Mock Study Section 2—Chair: Dr. De Leon
SRO: Michael Edwards, M.D., Assistant Professor, Division of Gastrointestinal Surgery
Department of Surgery, Medical College of Georgia, Augusta, GA

Mock Study Section 3—Chair: Dr. Franklin
SRO: Maria Davila-Bloom, Ph.D., Scientific Review Officer, NIDDK, Bethesda, MD

Mock Study Section 4—Chair: Dr. Azziz
SRO: James Hyde, Ph.D., Senior Advisor, Research Training and Career Development Programs,
Division of Diabetes, Endocrinology, and Metabolic Diseases, NIDDK, Bethesda, MD

Parallel Interactive Workshops–Higher Administration

Hiring Decisions, Human Resource-Related Issues, and Conflict Resolution
Dr. Azziz

Dr. Ricardo Azziz began his presentation by noting that dealing with human resource-related issues is often among the last skills that academics learn in their careers, but it is crucial to success. Management, including management of people, is the fourth leg of academics—in addition to medicine, research, and teaching.

Hiring needs to be performed with care. Often, people become overanxious about hiring because they think that any employee is better than none, but in fact this is not true. Having no employee is not worse than having a bad employee because having no employee just slows your work down; having a bad one can set the work back.

To hire well, it is important to define the job clearly and in detail. For example, it is important to establish whether the employee must function independently, whether the employee needs to work with or lead others, and what skills the employee will need. Investigators should recognize whether they can train the employee or whether the employee must already possess the necessary skills.

The interview process is a key to successful hiring. Interviews have two purposes: to sell yourself and your laboratory, and to determine whether the candidate would be a suitable employee. The process must be structured, with the same questions for all candidates. Behavioral questions are useful. Candidates should be asked how they have handled particular situations at work, such as personal conflicts. Practical demonstrations of skills are sometimes appropriate. A potential technician can be asked to perform a task in the laboratory; a person interviewing for a position that involves writing can be asked to write something within a time limit. At some point during the hiring process, previous employers should be contacted, including the candidate's current employer (although this last contact can be left until the end of the process if necessary).

Researchers should remember that they are not actually employers. They are employees who supervise other employees; the university/academic medical center is the employer. Thus, it is important to work with the human resources department, to learn about human resources policies and procedures, and to never attempt to handle personnel problems alone.

Retention of good employees is critical to success. It is much more difficult to recruit and train good employees than to retain them. Money is important for retention. It is easier to keep good employees if you pay them for good performance. Understanding employees' goals, priorities, and family needs, without becoming overly familiar with the employee, is also helpful. Researchers who become too familiar and friendly with their employees may lose their respect; this is especially a problem for young researchers, who may be the same age or younger than their employees. Employees should be given feedback, both positive and negative, on their work. Dr. Azziz recommends always following up on feedback in writing for the protection of both parties.

The Basics of a Mentoring Program
Dr. Loret de Mola

Dr. Loret de Mola observes that medical and scientific educators rarely receive training on mentoring. Yet a good mentoring relationship in the early years of a researcher's career is a critical element for success. Studies have shown high predictability of professional success depending on the presence of a mentor.

In the traditional closed system of mentoring, the one-on-one relationship is somewhat isolating and does not allow the influx of external influences. In an open system of mentoring, the relationship is inverted and focused on the protégé, who engages in relationships with a series of mentors, defined as a mentorage. The open system empowers the mentee to establish relationships and is more conducive to the evolution of a career.

Mentoring myths in medicine are that the relationship is one-way, mandatorily face-to-face, and time consuming. The relationships frequently grow into collaborative ones with the mentors learning from their protégés. With the Internet, videoconferencing, and conference calls, long distance mentoring can be equally as effective as being located down the hall. The assumption that the most senior members of a department are the best mentors is not always true; colleagues who have recently overcome contemporary professional obstacles may be more useful to the young researcher.

In the process of advising the trainee, the mentor gains new knowledge and lays the groundwork for future collaboration. Dr. Loret de Mola recalled his experience as a postdoctoral fellow when he introduced differential display into the laboratory, a technique completely new to his mentor, the principal investigator.

Mentors need to be non-judgmental and unbiased and be able to give constructive criticism and feedback. Mentors should strive to instill self-confidence in their protégés. Mentees should establish timelines for goals and seek guidance regularly. Other necessary qualities in the mentoring relationship are open communication, mutual respect, and acceptance of diversity and differing opinions. A mentor should regularly review the mentee's curriculum vitae, research activities, and schedule. Checking to see that the protégé is writing journal manuscripts from abstracts presented at scholarly meetings is another responsibility. The mentor should be available to meet with the mentee four times a year, for at least one hour.

Honing and Fine-Tuning Leadership Skills
Dr. Golub

At all levels of leadership, there are consistent leadership themes: defining objectives, developing process, building consensus, implementing change, and assessing results. Others evaluate a leader in terms of how well he or she performs these functions. Descriptors of good leaders include "fair," "accessible," "innovative," and "a person of integrity." In contrast, descriptors such as "self-serving," "isolated," "rigid," and "plays favorites" are indicative of very poor leadership.

Leadership styles vary, as do the ways they are described. A leader might be defined as flexible or indecisive, or as determined or obstinate, depending on the speaker's perspective. A key issue is to find out one's own leadership style and discover how it fits on the spectrum of styles.

Dr. Golub emphasized the need for leaders to learn leadership skills by doing. Managing budgets carefully, with attention to detail, is essential. Good leaders should delegate to others, rather than attempting to do everything themselves. Obtaining input from others, even on small projects, is crucial. Using a collaborative process is crucial, particularly in an academic environment. Leaders must find out how the process works at their particular institution and use that process. In academia, people will complain about a perfectly reasonable outcome if they think the process of reaching it was flawed. Accomplishing tasks on time also is an important leadership skill, as is being appreciative of those who contributed.

During discussion, participants mentioned the difficulties in leading large groups. Dr. Golub noted that once groups get beyond a certain size, bureaucracy develops, with rules that seem to hinder rather than promote the attainment of goals. The larger the bureaucracy, the more this is the case.

In response to a slide listing different types of leaders (manager, visionary, change agent, and problem solver), a participant asked how a leader decides which style to follow. Dr. Golub noted that this is a matter of judgment, with no specific formula. Another participant suggested that all of these types of leadership are required at different times, in different situations.

Sometimes, efforts are made to turn outstanding researchers into leaders. Dr. Golub pointed out that this, however, is not necessarily the ideal course of action. The best scientific investigators may not make the best leaders because leadership and research require different skill sets.

Institutions find leadership that matches their needs at a given time. An institution that needs consensus seeks different leaders than one that seeks change. Problems can develop when the leader's style does not match the situation, such as when a leader proposes massive changes at a time when everything is running smoothly.

When Dr. Golub asked for examples of leadership failure, one example cited by participants was self-serving leaders with their own agenda. Failures in financial management also were mentioned.

Developing Time Management Skills

Ms. Patricia Rush, President, Organization Twenty-One, Inc., McLean, VA

A model for time management takes into consideration overlapping categories: managing the work environment and activities, managing one's thinking and reasoning, and managing relationships and communications. Research by cultural anthropologist Edward T. Hall examined how different cultures perceive time. Some view time as linear and monochronic, divided into tangible, finite sections; others take a polychronic perspective that time is relative—like a flowing river; what is not done today can be done tomorrow because the river will still be there. Questions such as "How long does it take to fall in love?" or "How long does it take to become a good researcher or a good parent?" are framed in the polychronic dimension. Conflict arises when people are placed in polychronic situations with monchronic expectations—for instance, "Think outside the box, be creative NOW, because the deadline is tomorrow."

Steven Covey's book, *First Things, First,* gives guidance on how to better manage time. Identifying and recognizing (owning) the problem is a good start. Time researchers have determined that, on the average, people spend 45 minutes a day looking for lost paper. Ms. Rush recommended being diplomatic, yet assertive, when regularly interrupted by co-workers. By role-playing, participants demonstrated how non-verbal cues can effectively convey the desire to return to productive work.

Ensuring that all meetings have a specific agenda and purpose and allowing attendees to leave if their expertise is not needed throughout the entire meeting are suggestions for freeing up time. Workers can modify phone and e-mail practices to improve time management. Extra time should be added for the unexpected when estimating a job's scope. Another key to effective time management is keeping a diary and "to-do" list.

Covey's "Time Management Matrix" spells out how to prioritize the allocation of time. People often focus only on completing tasks that are urgent, while tasks that are important but not urgent are frequently postponed. This can cause problems down the road. Covey suggests that we consciously balance our time between handling the urgent and handling the important. The zone in which activities are neither important nor urgent is where time is frequently wasted. Ms. Rush advised researchers to break daunting tasks into smaller pieces and learn to delegate.

Business Meeting and Committee Reports

Dr. Azziz asked participants in the grant review sessions to send feedback to Dr. Young on her racial disparities grant and to Dr. Leah Tolosa for the grant on protein signaling.

He also stressed that something that many participants, especially young investigators, need to understand is that management skills are the fourth leg of academics.

Dr. Azziz recognized the NMRI Planning Committee for its work in producing the workshop and creating an exciting agenda for this annual meeting.

Oversight Committee Report
Dr. Sarapura

Dr. Bessie Young presented for Dr. Sarapura on the Oversight Committee meeting held at the workshop, and activities of the committee since the 2007 NMRI Annual Meeting. The mission of the Oversight Committee is to:

- Promote mentoring relationships;
- Identify new members and conduct outreach to societies;
- Establish groupings of NMRI members by interest and location;
- Organize informal gatherings at meetings or conferences of other organizations;
- Evaluate the effectiveness of the NMRI;
- Confirm that NMRI members are working in areas of interest to NIDDK.

Given this mission, the committee has determined that there is a need for a membership database with information to support the network, including areas of interest for members and society affiliations. This will allow the establishment of mentor-mentee pairs to work on specific objectives, with the ability to track outcomes, as well as for NMRI to obtain feedback on the effectiveness of the network. In order to gather information for this database, the committee circulated a survey to NMRI members. The NMRI Member Survey will include the following items:

- Level of training or position title;
- Attendance at NMRI meetings, motivation to attend or not;
- Interest in mentoring or being mentored;
- Research interest or expertise willing to share or areas needing assistance; and
- Other national or regional meetings attended.

The committee also developed a Mentor Agreement Form for mentors and mentees to establish objectives and track outcomes. Dr. Sarapura showed examples of the mentor-mentee agreement form, which is to be completed before beginning the mentoring process. The form, which is more like a memorandum-of-understanding rather than a contract, sets out a structure to clarify expectations and promote success in the mentor-mentee relationship.

Future activities of the Oversight Committee include the following:

- Identify other meetings attended by several NMRI members and encourage informal gatherings and outreach;
- Establish groups of NMRI members with similar interests and encourage collaborations; and
- Obtain feedback from mentors and mentees regarding the effectiveness of the program and the Mentor Agreement Form as a tool.

During discussion, it was pointed out that the mentor-mentee formalized system (i.e., form and tracking) will involve considerable work for senior investigators. It may be beneficial to consider compensating them for their efforts. The compensation could be more time to submit grant applications or another non-monetary benefit.

Dr. Azziz pointed out that after 7 years, NMRI should probably be evaluated to allow a review of the purpose and future plans of NMRI. One problem seen lately is the paucity of young investigators participating in NMRI. This may be an opportunity for concentrated recruitment and to develop programs that may be of more interest to this population.

There also was discussion of producing a NMRI newsletter to keep members and potential new members apprised of ongoing activities and to highlight successes of NMRI members. This would be a place to show how mentors and mentees are benefiting from their relationship.

Dr. Agodoa suggested that consideration should be given to expanding NMRI to other NIH ICs, such as NHLBI. There are many investigators at this meeting who work on diseases or conditions that cross over to various NIH ICs.

Planning Committee Report
Dr. Azziz

Dr. Azziz welcomed Dr. Greene, who will assume the Planning Committee Chair position for the next year.

Suggestions from the Planning Committee include the following:

- The meeting agenda this year seemed to be full, which is good for the interests of members, but it may be possible to schedule the agenda next year with fewer sessions and a greater opportunity to network;
- For the mock review sessions, it may be beneficial next year for NIDDK to assemble grants from NMRI members and receive permission to use them in training sessions at the workshop. Along with this, it would help to distribute the grants to members earlier so they have more time to review them before the meeting;
- Consideration should be given to webcasting some sessions of the NMRI Annual Meeting to allow greater distribution of the network to those who cannot attend the meeting;
- There needs to be more presentation on American Indian and Hispanic health issues;
- If possible, some time during the meeting should be allocated for mentors and mentees to meet.

Wrap-Up, Next Steps, and Adjournment

Dr. Azziz and Dr. Agodoa

Dr. Agodoa thanked Dr. Azziz for his stewardship of NMRI during the past year as Chair of the Planning Committee. He presented him a plaque in recognition of his hard work and for making the annual meeting successful.

Dr. Greene, the new Chair of the Planning Committee, thanked everyone for the opportunity to serve in the position and said that he would listen to suggestions about the format and content of the 2009 Annual Meeting. The date of the meeting is April 23-24, 2009, and it will be held in the Bethesda area.

Dr. Greene also announced that the next NMRI Regional Meeting will occur on November 12-14, 2008, in Chicago. Information on this meeting will be circulated soon.

In closing, Dr. Greene asked members to make a concerted effort to recruit new members to NMRI; this should be the goal for the coming year.

The meeting adjourned at 5:00 p.m.

National Institute of
Diabetes & Digestive &
Kidney Diseases