DEPARTMENT OF HEALTH AND HUMAN SERVICES

NATIONAL INSTITUTES OF HEALTH

Burden of Chronic Diseases

Witness appearing before the
Senate Subcommittee on Labor-HHS-Education Appropriations

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Richard J. Turman, Deputy Assistant Secretary, Budget

Mr. Chairman and Members of the Committee:

I am pleased to present the Fiscal Year (FY) 2008 President's budget request for the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) a sum of $1,858,045,000, which includes $150,000,000 for the Special Appropriation for Research on Type 1 Diabetes through Sec. 330B of the Public Health Service Act. The NIDDK transfers some of these funds to other institutes of the NIH and to the Centers for Disease Control and Prevention (CDC).

Our Institute supports research to combat a wide range of chronic health problems that affect many millions of Americans, and which can be debilitating, deadly, and expensive to treat. These include diabetes and other endocrine and metabolic diseases; digestive and liver diseases; kidney and urologic diseases; blood diseases; and obesity.

LEVERAGING PRIOR INVESTMENTS

Through continued investment in research, NIDDK-funded scientists have valuable assets at their disposal as they strive to mitigate or prevent chronic disease. These assets include both accumulated knowledge of life processes and the highly valuable data and cohorts of patients assembled through long-term investment in clinical research. For example, the landmark Diabetes Control and Complications Trial proved that tight control of blood glucose greatly diminished risk of eye, kidney, and nerve complications of type 1 diabetes. Patients who volunteered for this effort are providing scientists an invaluable opportunity to study long-term benefits of such care by participating in the follow-up study, Epidemiology of Diabetes Interventions and Complications. This study has now demonstrated that intensive blood glucose control also greatly diminishes risk of heart attack and stroke, with remarkably long-lasting benefits. Important knowledge is also being gained through the long-term follow-up of participants in the Diabetes Prevention Program (DPP), which established that regular physical activity and modest weight loss can prevent or delay type 2 diabetes in those at risk. In a recent advance, NIDDK-supported researchers capitalized on DPP data to study the effect of a gene in an Icelandic population identified by industry, confirming that variants in the gene predispose people in a diverse U.S. population to type 2 diabetes. Importantly, this study showed that the intensive DPP lifestyle and metformin interventions successfully delayed or prevented type 2 diabetes in people with the genetic risk factor. Thus, building on prior investments in clinical trials is yielding profound new insights into diabetes treatment and prevention.

Similarly, consortia for studying inflammatory bowel disease (IBD) and type 1 diabetes are leveraging years of careful, classical genetic analyses with findings of the Human Genome Project and HapMap to elucidate the complex genetic foundations of these diseases. Already, the IBD Genetics Consortium has identified a major genetic risk factor for the disease. The Beta Cell Biology Consortium is capitalizing on genomics with the PancChip, a tool that permits the study of genes in the pancreas. The NIDDK has created central repositories for saving and distributing data and biologic samples, and established its research consortia to synergize progress via these repositories, and trans-disciplinary cooperation.

More important than leveraging the opportunities for researchers are the direct benefits to patients that flow from these efforts. The Institute is committed to helping patients and health-care providers adopt research-driven innovations in disease treatment and management to improve lives. Crucial to NIDDK's approach are its education campaigns, including culturally-sensitive materials for disproportionately affected minority populations. These include the National Kidney Disease Education Program and the National Diabetes Education Program, which launched a new campaign to prevent diabetes in women who had gestational diabetes, and their offspring. The Interstitial Cystitis Awareness and Celiac Disease Awareness campaigns spotlight these often undiagnosed chronic illnesses. A key NIDDK goal is to derive the maximum benefit from prior investments, even as we continue to build for the future.

DEVELOPING PARTNERSHIPS

The NIDDK has strong, productive relationships with other NIH Institutes and Centers due to the intersection of our Institute's research responsibilities with those of other NIH components. For example, diabetes can lead to heart disease, blindness, and nerve disease, so we frequently collaborate with the NHLBI, NEI, and NINDS. The NIDDK also recognizes the vital importance of collaborating with other federal and state agencies and non-profit groups, as well as with external experts from the scientific, health care, and patient advocacy communities. For example, the Institute led the development, with broad stakeholder input, of strategic plans for type 1 diabetes research and for pediatric urology. The Institute is currently providing leadership to the development of a long-range research plan by the National Commission on Digestive Diseases. By engaging in highly collaborative strategic planning, the Institute endeavors to maximize use of its resources to best support future research advances.

In addition, the Institute is positioned to capitalize on opportunities for public-private partnerships. The Foundation for the NIH recently announced the formation of a Biomarkers Consortium, which combines resources and expertise of the NIH, the Food and Drug Administration, and the Pharmaceutical Research and Manufacturers of America. Biomarkers are measurable molecular, biological, or physical characteristics that indicate a specific underlying physiologic state and can facilitate accurate diagnosis, assessment of risk for or severity of a disease, and/or gauging response to therapy. The Consortium is seeking to accelerate the development of these biomarkers to a degree beyond the capacity of an individual partner. The NIDDK proposed and the Consortium accepted the "Diabetes and Pre-Diabetes Biomarkers Project." Building on an existing NIDDK study, the Project may make it possible to achieve significant health care savings and advantages by enabling more rapid and accurate detection of diabetes.

The NIDDK also values its important partnerships with the research community and with the patients who participate in clinical trials. Critical to the continued development of this human-capital resource is our commitment to new investigators, through priority funding, small grant and career awards, and mentoring workshops.

GENES AND THE ENVIRONMENT

New genomics technologies enable us to address scientific questions of enormous complexity and importance. For example, the Institute is very interested in the effect of genetics on liver health and response to therapeutics. NIDDK intramural scientists recently identified a gene that helps determine how people with hepatitis C respond to interferon therapy. Also, NIDDK's Drug Induced Liver Injury Network plans to look for genes that have an impact on whether various drugs cause liver damage.

Genetic data is key to deciphering the equation of health. The other key term in that equation is the way the environment influences health. "The Environmental Determinants of Diabetes in the Young" study is designed to solve this equation for type 1 diabetes, in which a one or more as-yet unidentified environmental triggers spark autoimmune destruction of the body's insulin-producing cells. The hope is that a vaccine or change of diet, for example, could one day prevent the disease in those at risk. The project may also provide key insights on environmental causes of celiac disease, which has overlapping genetic susceptibility with type 1 diabetes. In celiac disease, gluten—a major protein in wheat, rye, and barley—triggers an immune response that damages the small intestine and interferes with the absorption of nutrients. Microbes that live in the human gut represent a key part of our environment. Recent NIDDK-supported research has established that there is bidirectional induction of genes between the host and intestinal bacteria, influenced by other environmental factors, such as nutrients. Future NIDDK efforts seek to expand understanding of the genomes of the gut bacteria (the microbiome) and detail the microbes' impact on human health.

The NIDDK Metabolic Clinical Research Unit established at the NIH Clinical Research Center will permit intramural and extramural scientists an unprecedented opportunity to take environmental, dietary, and metabolic snapshots of normal, overweight, or obese patients. The facility will be an excellent resource for understanding the gene-environment interaction as it affects metabolic health, as well as for answering other research questions pertinent to obesity and overweight. Another effort to tie environmental variables to metabolic health outcomes is an initiative on the obese and diabetic intrauterine environment, which seeks to shed light on long-term consequences for offspring that can arise during this developmental period.

FORGING NEW PATHWAYS TO CARE

NIDDK-supported researchers continue to make dramatic strides in improving the health and well-being of people with chronic diseases. Institute and industry support combined to enable the development of continuous glucose monitors which can, in the short and medium term, reduce the number of painful, daily finger sticks for people with type 1 diabetes. Through better blood glucose control, the monitors may reduce their chances of serious complications in the long term. The NIDDK is also forging a new path to prevention through approaches such as the HEALTHY trial. This study is testing a school-based intervention to reduce students' type 2 diabetes risk factors in middle schools with predominantly minority populations. More than half of the children in these schools are overweight, and 15 percent have two additional disease risk factors. The NIDDK is also seeking to enhance evidence-based medicine through studies such as the "Randomized Intervention for Children with Vesicoureteral Reflux," a disease of the bladder. The trial is testing whether long-term use of antibiotics could prevent urinary tract infections in affected children, as well as scarring of the kidneys. For people with end-stage renal disease, NIDDK is conducting a trial to determine if more frequent dialysis improves quality of life and reduces cardiovascular risk.

Other new pathways to patient care may emerge from the "Biliary Atresia Clinical Research Consortium." This network is shedding light on this rare, poorly understood, but extremely serious disease by conducting basic studies to identify its causes and by testing the ability of a drug regimen to improve outcomes following surgery to improve bile drainage. Improvements in patient care may also come from the NIDDK's Molecular Therapy Centers, which are working to realize the potential of gene therapy care for patients with cystic fibrosis and other devastating genetic disorders.

The studies, trials, and initiatives I have highlighted represent just a few of the important elements in NIDDK's research agenda, made possible through a robust core of investigator-initiated studies, representing the solid foundation of NIDDK's research portfolio. Recent findings from this core research include: the discovery that the amount of a protein in blood correlates with insulin resistance in people at risk of type 2 diabetes; new technologies for imaging insulin-producing cells in the pancreas; and the identification of genes and proteins that regulate the absorption and utilization of iron and have key effects on development of red blood cells–discoveries that may have great importance in the treatment of common forms of anemia.

Thank you, Mr. Chairman, and members of the Committee, for this opportunity to share with you just a few highlights of NIDDK's vigorous research program. I would be pleased to answer any questions you may have.

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National Institutes of Health
National Institute of Diabetes and Digestive and Kidney Diseases
Biographical Sketch

Griffin P. Rodgers, M.D., M.A.C.P.

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 one 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 the 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 has 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 has 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 over 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.

Department of Health and Human Services
Office of Budget
Richard J. Turman

Mr. Turman is the Deputy Assistant Secretary for Budget, HHS. He joined federal service as a Presidential Management Intern in 1987 at the Office of Management and Budget, where he worked as a Budget Examiner and later as a Branch Chief. He has worked as a Legislative Assistant in the Senate, as the Director of Federal Relations for an association of research universities, and as the Associate Director for Budget of the National Institutes of Health. He received a Bachelor's Degree from the University of California, Santa Cruz, and a Masters in Public Policy from the University of California, Berkeley.