

## NATIONAL INSTITUTE OF DIABETES AND DIGESTIVE AND KIDNEY DISEASES

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### Mission:

The National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) conducts and supports research on many serious and costly diseases affecting the public health. Several diseases studied by the NIDDK are among the leading causes of disability and death in the nation; all significantly affect the quality of life of those suffering from them.

### Selected Accomplishments and Initiatives:

**Diabetes:** To address the alarming rise of type 2 diabetes in children and adolescents, the Institute has launched the *STOPP-T2D* initiative. One component is a study of *Treatment Options for Type 2 Diabetes in Adolescents and Youth (TODAY)*, which will evaluate three different therapeutic approaches. In other research, important knowledge is accruing from follow-up studies of patients in the *Epidemiology of Diabetes Interventions and Complications (EDIC) Study*. Researchers have found that early intensive therapy continues to provide dramatic benefits in reducing eye, nerve and kidney complications 20 years after the start of the study and 10 years after intensive therapy was provided to all participants. The *EDIC* has now shown that intensive therapy reduces thickening of the carotid artery wall — demonstrating for the first time that control of blood sugar might affect diabetes-related damage to the large blood vessels of the body. Likewise, new insights continue to emerge from studies that build upon the landmark clinical trial, *the Diabetes Prevention Program (DPP)*, which demonstrated that modest changes in diet and physical activity can reduce the chance of developing type 2 diabetes by 58 percent in at-risk individuals. Early results from an ancillary study to the *DPP* suggest that participants in the lifestyle intervention group also experienced less urinary incontinence, a condition associated with diabetes. In type 1 diabetes, the *Collaborative Islet Transplant Registry* recently published its first annual report on factors that can affect the outcome of this experimental procedure for patients with severe or complicated type 1 diabetes. This registry has recently expanded to include data from international sites. Major international consortia focused on type 1 diabetes research are now in place to speed research — including a Genetics Consortium and a Beta Cell Biology Consortium, as well as a new consortium to conduct studies in islet transplantation.

**Obesity:** To combat the epidemic levels of obesity in the U.S., the NIDDK is pursuing a variety of research focused on prevention and treatment strategies, including studies to define brain pathways that regulate calorie intake and energy expenditure. For example, studies in mice have shown that the fat-cell hormone leptin not only acts in the brain to regulate feeding behavior, but may also contribute to the early development of the neural circuitry that regulates energy balance. Similarly, the study of an insulin-responsive signaling pathway shared by cells in the brain and by insulin-producing beta cells has enhanced understanding of the relationship between centralized appetite regulation, peripheral insulin resistance, and obesity. In research on lifestyle modification, the multi-center clinical trial, *Look AHEAD (Action for Health in Diabetes)*, is examining whether an intervention designed to achieve

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intentional long-term weight loss through exercise and decreased caloric intake will improve cardiovascular and other outcomes in obese individuals with type 2 diabetes. Through a new consortium, the *Longitudinal Assessment of Bariatric Surgery (LABS)*, researchers will assess the risks and benefits of weight loss surgery in patients with extreme obesity. The potential of environmental modifications for obesity prevention is another area of intense investigation. The recently published Strategic Plan of the NIH Obesity Research Task Force, which is co-chaired by the NIDDK Director, is guiding program development.

**Cystic Fibrosis:** Researchers have demonstrated in animal models that treatment with curcumin, a compound well-tolerated by humans, may correct the molecular defect underlying the most common cause of cystic fibrosis. Importantly, the amount of curcumin that achieved these promising results in mice is equivalent to a dose that has been well-tolerated by humans in previous studies. Therefore, curcumin, which is already known to be safe in people, has the potential to become a new therapy for patients with this devastating illness.

**Digestive Diseases:** In the search for more effective therapies for inflammatory bowel diseases, researchers are exploiting the major discovery of the first gene shown to confer susceptibility to Crohn's disease (*NOD2/CARD15*). Recent studies of mutations in this gene now suggest some patients may have defects in regulating the innate immune system in response to bacterial products in the intestine. Celiac disease may be more prevalent in the U.S. than previously believed. In response to the recommendations of a June 2004 NIH Consensus Development Conference on Celiac Disease, the NIDDK is formulating a celiac disease awareness campaign. To combat hepatitis C in children, a multi-center clinical trial of therapy is under way, in collaboration with the FDA and industry. Through a cooperative effort, the NIH Office of Rare Diseases, the NCRR, and the NIDDK have launched the *CLiC Consortium* to conduct clinical studies of several rare cholestatic liver diseases in children. A new initiative is establishing the *Drug Induced Liver Injury Network* to study the causes and epidemiology of medication-induced liver disease in the U.S.

**Kidney Diseases:** With the full-scale launch of the *National Kidney Disease Education Program*, efforts are intensifying to reduce morbidity and mortality from kidney disease by raising awareness and stressing the importance of prevention, early diagnosis, and appropriate management. The *Dialysis Access Consortium* has launched two phase III clinical trials to investigate better ways to use anti-clotting agents to maintain the vascular graft in patients undergoing frequent dialysis. Recent studies have underscored the link between heart disease and chronic kidney disease, which is also being studied prospectively in the Chronic Renal Insufficiency Cohort.

### Appropriations History

(\$ in thousands)

FY 2001	\$1,399,684 (+19.8%)
FY 2002	\$1,562,144 (+11.6%)
FY 2003	\$1,722,730 (+10.3%)
FY 2004	\$1,821,803 (+5.8%)
FY 2005	\$1,863,584 (+2.3%)

### Extramural Research Project Grants

(Includes SBIR/STTRs)

FY 2001	2,896
FY 2002	3,028
FY 2003	3,275
FY 2004	3,468
FY 2005	3,451

### Success Rate — Research Project Grants

FY 2001	29%
FY 2002	34%
FY 2003	33%
FY 2004	27%
FY 2005	24%

### Research Training Positions Supported

FY 2001	1,013
FY 2002	1,080
FY 2003	1,144
FY 2004	1,154
FY 2005	1,172

### Research Centers

FY 2001	69
FY 2002	69
FY 2003	78
FY 2004	77
FY 2005	79