# NATIONAL INSTITUTE ON DEAFNESS AND OTHER COMMUNICATION DISORDERS


## Address:
National Institute on Deafness and
Other Communication Disorders
National Institutes of Health
Building 31, Room 3C02
31 Center Drive, MSC 2320
Bethesda, MD 20892-2320
Web site: www.nidcd.nih.gov/

## Director:
James F. Battey, Jr., M.D., Ph.D.
(301) 402-0900 (phone)
(301) 402-1590 (fax)
(301) 496-6596 (TTY)
Email: batteyj@nidcd.nih.gov

## Legislative Contact:
Anne White-Olson
(301) 496-2691 (phone)
(301) 402-2265 (fax)
Email: anneo@nidcd.nih.gov


## Mission:
The National Institute on Deafness and Other Communication Disorders (NIDCD) conducts and supports biomedical and behavioral research and research training in the normal and disordered processes of hearing, balance, smell, taste, voice, speech, and language. NIDCD accomplishes its mandate by conducting research in its own laboratories in the Division of Intramural Research; supporting an Extramural Research Program for non-federal scientists at universities, medical schools, hospitals, and research institutions; and facilitating the training of scientists in the fields of human communication research. NIDCD has focused national attention on disorders of human communication and has contributed to advances to biomedical and behavioral research that will improve the lives of over 46 million Americans with communication disorders. Some of the research areas within the NIDCD's mission include hereditary forms of hearing impairment, Meniere's disease, autoimmune hearing loss, impaired sense of smell or taste, specific language impairment, stuttering, and aphasia.

## Selected Achievements and Initiatives:
*Treatment for Otitis Media:* Otitis media (middle ear infection) is the most common reason for a young child to be taken to a physician, and is the most frequent reason that doctors prescribe antibiotic therapy for children. Repeated bouts of otitis media can lead to hearing loss, underscoring the need for a vaccine to prevent this costly and destructive disease. With the emergence of antibiotic-resistant strains of bacteria that cause otitis media, NIDCD scientists have developed a candidate vaccine to prevent otitis media caused by common bacterial pathogens, and have completed Phase I testing of this vaccine in clinical trials. Results of this trial suggest that this investigational vaccine may be useful in preventing otitis media in children. In a prospective study involving twins and triplets, NIDCD-supported scientists have determined that a strong genetic link is associated with the rate of occurrence of otitis media in children. Studies of the genetic mechanisms responsible for the increased risk and frequency of this disease could lead to additional approaches for intervention and treatment.

*Cochlear Implants Restore Communication Capacity:* The cochlear implant is the only sensory neural prosthesis in widespread clinical use. This device converts sound into electrical impulses on an array of electrodes that is surgically inserted into the inner ear, bypassing the inner ear hair cells and stimulating the auditory nerve directly, restoring the perception of sound to persons who are totally, or almost totally, deaf. Longitudinal clinical studies show that deaf children who receive the implant during the period when language skills are developing can acquire good speech and auditory/aural communication skills. NIDCD-supported scientist are discovering improvements

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in the electrode array and sound processing algorithms, making the cochlear implant a useful device for an ever-expanding group of individuals with severe hearing impairment who receive marginal benefit from using hearing aids. Additional research has shown that performing implant surgery before two years of age in a child with a congenital deafness results in better long-term language skills than when surgery is performed later in childhood.

*Identifying Gene Mutations that Cause Hereditary Hearing Impairment:* It is estimated that at least one child in a thousand born in the United States has severe hearing impairment and, in almost two-thirds of the cases, the etiology is genetic. Many genes that cause hereditary hearing impairment have been located, and mutations in about fifty of these genes cause hearing impairment in the absence of other clinical findings (non-syndromic hereditary hearing impairment). Remarkable progress has been made within the last few years by NIDCD-supported scientists in identifying these genes and their loci. Empowered by the progress made in understanding the structure of the human genome, these scientists are now determining the precise identity of these hereditary hearing impairment genes and the nature of mutations in these genes that cause hereditary hearing impairment. This new information is rapidly being incorporated into clinical studies that will lead to better diagnosis and treatment for individuals with hereditary hearing impairment.

**Appropriations History**
*($ in thousands)*

| | |
|---|---|
| FY 2001 | $300,418 (+13.9%) |
| FY 2002 | $341,675 (+13.7%) |
| FY 2003 | $370,382 (+8.4%) |
| FY 2004 | $382,053 (+3.2%) |
| FY 2005 | $394,260 (+3.2%) |

**Extramural Research Project Grants**
*(Includes SBIR/STTRs)*

| | |
|---|---|
| FY 2001 | 809 |
| FY 2002 | 893 |
| FY 2003 | 927 |
| FY 2004 | 936 |
| FY 2005 | 935 |

**Success Rate — Research Project Grants**

| | |
|---|---|
| FY 2001 | 42% |
| FY 2002 | 39% |
| FY 2003 | 38% |
| FY 2004 | 35% |
| FY 2005 | 27% |

**Research Training Positions Supported**

| | |
|---|---|
| FY 2001 | 301 |
| FY 2002 | 332 |
| FY 2003 | 342 |
| FY 2004 | 351 |
| FY 2005 | 348 |

**Research Centers**

| | |
|---|---|
| FY 2001 | 19 |
| FY 2002 | 25 |
| FY 2003 | 25 |
| FY 2004 | 22 |
| FY 2005 | 21 |