DEPARTMENT OF HEALTH AND HUMAN SERVICES

NATIONAL INSTITUTES OF HEALTH

National Library of Medicine

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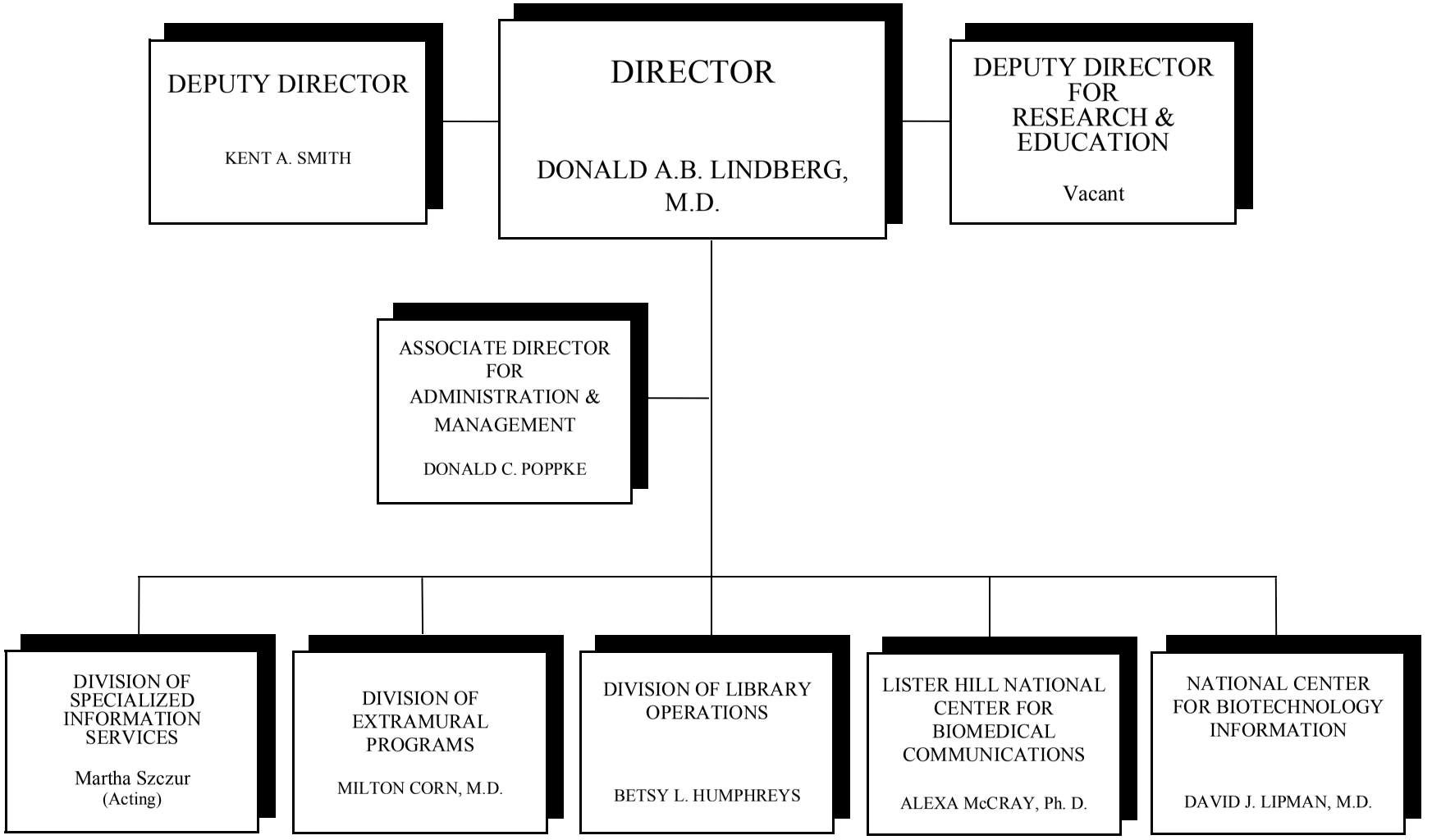
NATIONAL INSTITUTES OF HEALTH
NATIONAL LIBRARY OF MEDICINE
ORGANIZATION STRUCTURE



NATIONAL INSTITUTES OF HEALTH

National Library of Medicine

For carrying out Section 301 and Title IV of the Public Health Service Act with respect to health information communications, [$277,658,000] *$308,987,000,* of which $4,000,000 shall be available until expended for improvement of information systems: Provided, That in fiscal year [2002] *2003* the Library may enter into personal services contracts for the provision of services in facilities owned, operated or constructed under the jurisdiction of the National Institutes of Health.

[Departments of Labor, Health and Human Services, Education, and Related Agencies Appropriations Act, for Fiscal Year 2002 (P.L. 107-116)]

National Institutes of Health

National Library of Medicine
Amounts Available for Obligation 1/

Source of Funding	FY 2001 Actual	FY 2002 Estimate	FY 2003 Estimate
Appropriation	$246,801,000	$277,658,000	$304,123,000
Enacted Rescission	(399,000)	(385,000)	---
Subtotal, Adjusted Appropriation	246,402,000	277,273,000	304,123,000
Comparable adjustment for legislative proposal for accrued retirement costs	4,175,000	4,479,000	4,864,000
Real transfer to:			
Other HHS Agencies through Secretary's one-percent transfer authority	(47,000)	---	---
Real transfer to HHS for the Office of Human Research Protection	(51,000)	---	---
Real transfer for Buildings and Facilities	(7,115,000)	---	---
Comparative transfer from:			
National Cancer Institute for research activities	---	---	6,176,000
Comparative transfer to:			
National Institute of Biomedical Imaging and Bioengineering (NIBIB)	(966,000)	---	---
Subtotal	242,398,000	281,752,000	315,163,000
Subtotal, adjusted budget authority	242,398,000	281,752,000	315,163,000
Unobligated balance, lapsing	121,000	---	---
Total obligations	242,277,000	281,752,000	315,163,000

1/ Excludes the following amounts for reimbursable activities carried out by this account:
FY 2001 - $6,810,000; FY 2002 - $6,810,000; FY 2003 - $6,810,000
Excludes $11,320,000 in FY 2001 and $11,320,000 in FY 2002 for royalties.

Justification

National Library of Medicine

Authorizing Legislation: Section 301 and Title IV of the Public Health Service Act, as amended. Reauthorizing legislation will be proposed.

Budget Authority:

	2001 Actual	2002 Appropriation	2002 Current Estimate	2003 Estimate	Increase or Decrease
Current Law BA	$238,223,000	$277,658,000	$277,273,000	$310,299,000	$33,026,000
Accrued Costs	4,175,000	4,479,000	4,479,000	4,864,000	385,000
Proposed Law BA	242,398,000	282,137,000	281,752,000	315,163,000	33,411,000
FTE	656	691	691	688	-3

This document provides justification for the Fiscal Year 2003 activities of the National Library of Medicine (NLM), including HIV/AIDS activities. A more detailed description of NIH-wide Fiscal Year 2003 HIV/AIDS activities can be found in the NIH section entitled "Office of AIDS Research (OAR).

The President's appropriations request of $315,163,000 for this account includes current law adjusted by assuming Congressional action on the proposed Managerial Flexibility Act of 2001.

INTRODUCTION

The National Library of Medicine (NLM) has evolved into an agile instrument for the dissemination of medical knowledge. Historically, this collection of medical books and journals--the world's largest--was seen as a resource exclusively for scientists and doctors. Today, it serves everyone. The Library's pioneering work in applying communications technology, begun in the sixties, has culminated in today's electronic information services that are used extensively not only by researchers and health professionals, but by patients, their families, students, special populations such as the elderly and, in fact, anyone with a need for access to reliable health information. This transformation to electronic access has resulted in the Library's collections and electronic services being consulted at a rate in excess of 400 million times a year, accounting for a large portion of the usage of the National Institutes of Health Web environment. PubMed/MEDLINE is the most popular of the Library's services and accounts for most of the use.

A grim example of Library's ability to respond to changing needs is its quick action in the wake of the September 11 attacks. NLM information specialists sought out reliable information about, for example, bioterrorism, anthrax, and smallpox. These were made easily accessible to all in MEDLINEplus, the Library's consumer health information Web site, and also are available from

information sources in our toxicology program. Improvements in both PubMed/MEDLINE and MEDLINEplus are among the advances described below.

The products and services described below are available on the Web through the NLM home page at **www.nlm.nih.gov**.

STORIES OF DISCOVERY

Tools for the Scientist and Practitioner

MEDLINE/PubMed

The "literature" is the touchstone of progress in medical research and practice. In the health sciences, the standard reference source since 1879 has been NLM's published bibliography, *Index Medicus*. For the past 30 years it has been supplemented by MEDLINE, an online database derived from the *Index Medicus*. MEDLINE is a constantly growing online file that at last count contained more than 12 million references and abstracts to articles from 4,600 medical journals. When it appeared in 1971, it was truly a pioneering effort in information technology, and it is today the most authoritative entry point into an ever-expanding biomedical literature. The MEDLINE files extend from the nineteen fifties to the present, and the Library is now adding data from even earlier years.

The sophisticated yet easy-to-use access system for searching MEDLINE on the Web is called PubMed. Since the launch of PubMed in 1997, continual improvements have been introduced, and today it offers a high degree of flexibility. For example, there are now Web links to some 2100 of the journals represented in MEDLINE, allowing users to have access to the full text of articles referenced in the database. Where such links are not available, users may avail themselves of the MEDLINE/PubMed feature known as "Loansome Doc" to place an online order for an article directly from a library in the National Network of Libraries of Medicine. A recent enhancement to MEDLINE/PubMed is the personalized "cubby," which allows the user to store and update searches between sessions. With the complete retirement of the Library's mainframe computer system in October 2001, the Web-based PubMed is now the sole route of access to MEDLINE from the NLM. (MEDLINE is leased by several commercial organizations who also provide access to its data.)

New Full-Text Resources

An increasingly popular service on the Web for the scientist and health professional is PubMedCentral. This is a digital archive of life sciences journal literature, created by NLM's National Center for Biotechnology Information (NCBI). Publishers electronically send peer-reviewed research articles, essays, and editorials to be included in PubMedCentral. A journal may deposit material as soon as it is published, or it may delay release for a specified period of time. NLM undertakes to guarantee free access to the material; copyright remains with the publisher or the author. There are at present more than 50 journals in PubMedCentral, with more soon to come online.

The latest innovation from the NCBI is a service called the "NIH Bookshelf." This is a growing collection of biomedical textbooks that has been assembled in collaboration with the book publishers. There are currently six books available, including texts on genetic analysis, molecular biology of the cell, and retroviruses. Several more scheduled for inclusion over the coming months. The book content can be found by directly searching the Bookshelf, or through phrases in MEDLINE/PubMed abstracts that have been hyperlinked to relevant book sections. Some of the books can also be browsed via the Table of Contents. The Bookshelf uses a similar search interface to PubMed. The integration of books with PubMed (and, in the future, other resources such as the full text of research articles and the human genome sequence) will assist the understanding of biomedical information by providing context to research findings. This background information will not only be of use to biomedical researchers, but also to students and non-experts who access NLM resources over the Internet. Topics covered by books that are scheduled for inclusion in the near future include immunology, neuroscience, cancer medicine, and developmental biology.

Profiles in Science

The Library's popular Web site, "Profiles in Science," has been expanded to eight profiles. Four Nobel-prize-winning scientists were recently added: biochemist Christian Anfinsen, molecular biologist Marshall Nirenberg, geneticist Barbara McClintock, and chemist Linus Pauling. Profiles in Science features illuminating correspondence, laboratory notes, unpublished manuscripts, and photographs from outstanding scientific careers. This site, begun in 1998, promotes the use of the Internet for research and teaching in the history of biomedical science. Profiles in Science is becoming a major online resource for storing the public and private--and sometimes intimate--papers of this century's greatest biomedical scientists.

Integrated Advanced Information Management Systems (IAIMS)

For 20 years the Library has sponsored a highly successful grant program to help academic health centers develop innovative methods of managing the massive amount of medical information involved with health science education and research. A high-level advisory panel has reviewed the program, known as Integrated Advanced Information Management Systems (IAIMS), and made important recommendations to refocus the program for the new information environment. Among the elements affecting the needed changes: the proliferation of information sources, the lack of standards for integrating information from diverse sources, and the "permeable" boundaries between disparate information formats that are juxtaposed with inflexible walls between traditional academic missions (such as health care, research, and education). If the challenge of the 1980s was building infrastructure and organizational mechanisms for managing knowledge, the challenge of the 21st century is acquiring, shaping, and delivering that knowledge in a way that binds it to effective action. The report makes a number of recommendations that will allow NLM to refocus its IAIMS program so that it will stimulate the development of new tools and techniques that will assist academic health centers to manage information and knowledge for the improvement of learning and to aid in discovery.

Tools for the Consumer

MEDLINEplus

As noted in the Introduction, the Library's mandate now includes the general public as well as health professionals. One impetus for this was the enthusiasm with which consumers embraced free MEDLINE on the Web when it became available in 1997. It soon became clear that 30 percent of all MEDLINE searching was being done by the public. We heard about patients who use the database to do research on their condition, and arrive at the doctor's office with articles from the scientific literature. In an effort to arm the public with more useful information, the Library, in 1998, introduced MEDLINEplus, a source of authoritative, full-text health information targeted at general audiences from the NIH institutes and a variety of non-Federal sources.

MEDLINEplus has grown tremendously, both in terms of its broad coverage of the health spectrum and its usage by the public. As of November 2001, it was being consulted 8 million times each month by 800,000 individual users. The original two dozen "health topics," containing detailed consumer information on various diseases and health conditions, have been increased to 500, including those related to the events of September 11, as mentioned in the Introduction. Other information available through MEDLINEplus includes medical dictionaries, an extensive medical encyclopedia written in lay language with thousands of illustrations, detailed information about more than 9,000 brand name and generic prescription and over-the-counter drugs, information in Spanish, directories of health professionals and hospitals, and links to organizations and libraries that provide health information for the public. The newest additions to MEDLINEplus are illustrated interactive patient tutorials and a daily news feed from the public media on health-related topics. The NLM, working with the National Institute on Aging, recently created a version of MEDLINEplus that is especially usable by senior citizens.

The Library has also learned that health professionals of all kinds are finding MEDLINEplus to be an excellent source of information. Many physicians use it to keep current on medical subjects outside of their specialty. Others are referring their patients to MEDLINEplus for up-to-date and authoritative information about their health conditions. One reason physicians feel comfortable in doing this is that they trust the imprimatur of the NIH and the National Library of Medicine. They know that highly trained NLM information specialists follow strict guidelines in selecting Web pages that are appropriate to the audience level, well-organized, easy to use, educational in nature, and not selling a product or service. NLM librarians ensure that the source of the information is dependable, with an advisory board whose names are listed, and that the site is consistently available and its links reliably maintained.

ClinicalTrials.gov

Many of the 500 MEDLINEplus health topics have links to a database of ongoing and planned scientific studies, or clinical trials as they are called. These are medical research studies that seek to evaluate the safety and effectiveness of new drugs and medical procedures. Trials are conducted when there is no proven treatment for a specific disease, or to test which treatment works best for a particular disease of condition. Not only do MEDLINEplus health topics link to ClinicalTrials.gov (as the database is called) but the reverse is also true: users of

ClinicalTrials.gov can link to consumer health information in MEDLINEplus relating to the subject of a clinical trial. The database, which has more than 5,000 visitors daily, is a registry of some 5,700 trials for both federally and privately funded trials of experimental treatments for serious or life-threatening diseases. Most of the studies are in the U.S. and Canada, but about 70 countries are represented in all. ClinicalTrials.gov includes a statement of purpose for each study, together with the recruiting status, the criteria for patient participation in the trial, the location of the trial, and specific contact information.

Complementary and Alternative Medicine (CAM)

Another Web-based information resource sponsored by NLM with the general public in mind is "CAM on PubMed." This popular new service became available in 2001. Created by NLM in collaboration with the National Center for Complementary and Alternative Medicine, the service allows users to limit a MEDLINE/PubMed search to articles about complementary and alternative medicine. The CAM on PubMed subset currently contains more than 220,000 references to journal articles related to CAM research. As the field of research in this area grows and more articles are published in peer-reviewed journals, the service will greatly expand.

Outreach to the Nation and the World

National Network of Libraries of Medicine

The National Network of Libraries of Medicine continues to be the NLM's primary collaborator in outreach to the U.S. biomedical community and to the public. The Network consists of 8 Regional Medical Libraries, 150 resource libraries (at medical schools and other major institutions), and 4500 libraries at hospitals, clinics, and local health institutions. In 2001 the NLM competitively awarded new 5-year contracts to eight institutions to serve as Regional Medical Libraries. The goal of the Network is to provide access to accurate and up-to-date health information for health professionals, patients, families, and the general public, irrespective of their geographic location. There are two specially funded Centers among the Regional Medical Libraries--one serves as a National Training Center and another serves as a National Outreach Evaluation Resource Center.

The Network places a special emphasis on outreach to underserved populations in an effort to reduce health disparities. For example, there are programs to assist in remedying the disparity in health opportunities experienced by such segments of the American population as African Americans, Latinos, Native Americans, senior citizens, and rural populations. Network members work with a variety of intermediaries, including health care providers, public health professionals, public librarians, educators, community organizations, health advocacy groups, faith-based organizations, and self-help groups, to reach members of the public. The Regional Medical Libraries also exhibit and demonstrate NLM's products and services at national, regional and state health professional and consumer oriented meetings; provide training and consultations; coordinate the basic network services such as interlibrary loan; and work to improve the supporting infrastructure for health sciences libraries.

"ArcticHealth" Database

A new online service for a Native American population, introduced at the end of 2001, is a Web site aimed at the special needs of the inhabitants of the Arctic. "ArcticHealth," as it is called, provides access to evaluated health information from hundreds of local, state, national, and international agencies, as well as from professional societies and universities. The population in this challenging climate is subject to a unique set of health and environmental challenges. Threats from environmental contaminants, particularly persistent organic pollutants and metals, and their potential bioaccumulation in the food supply, play an important role in the dietary health of areas where hunting and fishing are widespread. Cancer, liver disease, and alcoholism are among the prevalent chronic conditions afflicting many inhabitants of the Arctic. Emerging infectious diseases are an ever present danger, and the thinning of the ozone layer over the Northern Hemisphere puts people's skin and eyes at increased risk. The ArcticHealth database has sections devoted to chronic diseases, behavioral issues, traditional medicine, pollution, and environmental justice. ArcticHealth is the first in what may become a series of health information Web sites for special populations. Having created the site, the NLM plans to work with the Regional Medical Library at the University of Washington in Seattle to have ArcticHealth hosted and maintained by a university already working with issues important to the target population.

Outreach to the AIDS Community

NLM provides project management for the DHHS AIDS Clinical Trials Information Service and the HIV/AIDS Treatment Information Service (ATIS). These two programs are collaborative efforts involving the NIH Office of AIDS Research, the National Institute of Allergy and Infectious Diseases, the Centers for Disease Control and Prevention, the Health Resources and Services Administration, the Centers for Medicare and Medicaid Services, and the Food and Drug Administration. These sister services provide access to AIDS-related clinical trials (ACTIS) and to federal treatment guidelines for HIV infection and related opportunistic diseases. Access is via the web or a toll-free telephone service staffed by health and information professionals. These services serve as repositories of important information and provide services that are free and protect the privacy of users. Information is available for health professionals and other care providers as well as for patients and the general public. Additional information available in print and on the web serves to put research and treatment into context for patients and potential patients.

There are other NLM programs targeting groups of citizens with special health information needs. In the past year, the Library has made some 30 awards to continue its HIV/AIDS-related outreach efforts to community-based organizations, patient advocacy groups, faith-based organizations, departments of health, and libraries. This program provides support ($25,000-$40,000 per project) to design local programs for improving information access for HIV-infected patients and the affected community as well as their caregivers. The emphasis of the program is on providing information or access to information in a way that is meaningful to the target community. It may include training in information retrieval, sending interlibrary loans, and providing Internet access. In a related grant program benefitting AIDS and other community organizations, in the fall of 2001 the NLM awarded 34 Internet connection grants totaling more

than $1 million. These grants helped establish (or upgrade) Internet connections for clinics and local health departments in both rural areas and inner-city neighborhoods.

Outreach to Public Libraries

The NLM, working with members of the National Network of Libraries of Medicine, is also reaching out to public libraries in an effort to improve consumer access to good health information. The public library is frequently the first institution the public turns to when seeking to answer a question. Because virtually all American public libraries provide their patrons with Web access, the NLM has funded dozens of projects from coast to coast to help those librarians steer the public to reliable sources. Also, in a first-ever collaboration, in 2001 the NLM co-sponsored with the Medical Library Association and the Public Library Association a conference to focus on helping public library patrons find quality health information. NLM's current emphasis on health information for consumers made this a natural collaboration between two branches of the library community. At the 2-day conference, held in Washington, D.C., public librarians were introduced to health information resources and collection development and training in how to search health and medical databases.

International Outreach

NLM also has programs of international outreach. Since its earliest days in the 19th century, the Library has eagerly sought out medical literature from other countries for its collection. The published *Index Medicus* and the online databases both reflect the international character of medical publishing. Bilateral agreements between the Library and more than 20 public institutions in foreign countries allow them to serve as International MEDLARS Centers. As such, they assist health professionals in accessing MEDLINE and other NLM databases, offer search training, provide document delivery, and perform other functions as biomedical information resource centers. The newest International Center, on board in 2001, is the University of Oslo Library of Medicine and Health Sciences in Oslo, Norway. That Library will provide online search assistance, training, and document delivery to health professionals and libraries in Norway and in Baltic States. They will also translate NLM's vocabulary, known as Medical Subject Headings, into Norwegian.

Another international partnership in which the NLM is a key player is the Multilateral Initiative on Malaria. This project, under NIH's leadership, responds to African scientists' request for improved communication in the fight against the devastating and economically debilitating effects of malaria in developing countries. NLM's mandate as leader of the Communications Working Group has been to leverage partnerships to create a malaria research network in Africa, enabling scientists there to have full access to the Internet and the Web as well as access to medical literature. The aim is to allow researchers, any time of the day or night, to have instantaneous Internet access that will enable them to send and receive e-mails, search for literature, interrogate databases, share files and images with colleagues, and generally move to a new and more efficient way of doing collaborative research. There are at present 10 installations in Ghana, Kenya, Tanzania, and Uganda. Pending completion of connectivity are stations in Burkina Faso, Cameroon, Gambia, Nigeria and Gabon.

SCIENCE ADVANCES

The National Library of Medicine remains at the cutting edge of research and development in medical informatics--the intersection of computer technology and the health sciences. It does this both through a program of grants and contracts to university-based researchers and through Research and Development conducted by the NLM's own scientists. The Library was a leader in the High Performance Computing and Communications initiative of the nineties and is presently working to ensure that the health sciences are prepared to take full advantage of the Next Generation Internet. NLM's Lister Hill National Center for Biomedical Communications conducts a wide range of research to improve biomedical communication and also oversees a broad-gauge telemedicine program and the Visible Human Project. Another major NLM component, the rapidly expanding National Center for Biotechnology Information, conducts research and creates information services for scientists working in the field of human genetics.

The Next Generation Internet

The Library has used a variety of mechanisms--grant and contract--in the past several years to fund a variety of Next Generation Internet projects. The Next Generation Internet initiative is a cooperative effort among industry, academia, and government agencies that seeks to provide affordable, secure information delivery at rates thousands of times faster than today. Many health applications involving, for example, telemedicine and the Visible Humans, require more bandwidth than is currently available. For some health applications, the quality of Internet service is the limiting factor. Other applications require a guaranteed level of service (for example no data loss, or assured privacy protection) that today's Internet cannot provide. In addition to supporting such advanced applications as those that follow, the NLM continues its research on evaluating the performance of today's Internet pathways between and among health institutions and users. This research, by comparing the relative performance of the available Internet and new high-bandwidth links for downloading and transferring large files of data and images, gives us a glimpse into what the future holds.

The Visible Humans

The Visible Human Project is an example of a program that requires both advanced computing techniques and the capability of the Next Generation Internet if it is to be maximally useful. The Visible Human male and female data sets, consisting of MRI, CT, and photographic cryosection images, were released by NLM as national resources in 1994 and 1995. The data sets are huge, totaling some 55 gigabytes, and are being used by over 1,700 licensees in 43 countries. The data sets can be obtained over the internet without charge from the NLM and from four mirror sites, two in Asia and two in Europe. The data sets are being used in a wide range of educational, diagnostic, treatment planning, virtual reality, artistic, mathematical, and industrial uses.

In medical education, the Visible Humans are becoming the touchstone of 21st century anatomy. Projects run the gamut from teaching anatomy to practicing endoscopic procedures to rehearsing surgery. NLM's AnatLine is a web-based image delivery system that provides retrieval access (even from a home computer) to large anatomical image files of various parts of the Visible Human male thoracic region, such as the heart and stomach, including 3D images.

The Visible Human Project is moving to a new phase: "From Data to Knowledge." This phase currently consists of three projects. The Visible Human Atlas of the Head and Neck seeks to develop an extremely detailed, web accessible, interactive, 3-dimensional, functional anatomy atlas of the head and neck. This will be used both in educational models for the functional processes of facial expression, mastication, deglutition, phonation, hearing, and vision, and for surgical planning by maxillofacial specialists. Another project is Insight, which seeks to develop a public domain image processing software toolkit based on the Visible Human datasets. The third, the Anatomical Methods project, is designed to develop new histological techniques that will stabilize anatomical tissue in order to make the capture of high resolution, high contrast anatomical data possible. The "From Data to Knowledge" phase of the Visible Human Project is being supported by the NLM with additional funding from six NIH institutes and the National Science Foundation.

Telemedicine

Telemedicine is the use of telecommunications technology for medical diagnosis and patient care, and is a medium for delivering medical services to sites that are at a distance from the provider. The concept encompasses everything from the use of standard telephone service to high-speed, wide-bandwidth transmission of digitized signals in conjunction with computers, fiber optics, satellites, and other sophisticated peripheral equipment and software. The Library has used a variety of mechanisms in the past several years to fund a variety of innovative telemedicine projects that demonstrate the application and use of the capabilities of the Next Generation Internet.

One example is the NLM-supported "A Clinic in Every Home." This is an especially promising telemedicine project with the Iowa Department of Public Health and the University of Iowa. Building on work successfully done under an existing contract with NLM, this project is providing a test-bed for medically underserved rural Iowa residents to provide them with access to high quality health care. The expectation is that using such a system will both raise the quality of health care and lower health care costs.

NLM for several years has had a telemedicine/connections program for Native Americans in the Pacific Northwest conducted through the Regional Medical Library for that area. The project is connecting tribal educational and health facilities to the Internet and thus reducing the isolation from quality health information and health care of this vulnerable population. Many of the involved communities (16 villages and tribes in Alaska, Washington, Idaho, Montana, and Oregon) are in isolated rural areas. In another project, at the University of Alaska in Anchorage, doctors are using "store and forward" telemedicine technology to assist health aides in isolated Native American frontier villages to diagnose ear infections correctly and thus prevent the overuse of antibiotics. If the village health aide cannot definitively diagnose an ear infection, a full color digital picture of the eardrum is captured and sent as an e-mail attachment to the specialist at the hospital. The specialist makes the diagnosis, determines the course of treatment and telephones the health aid with the findings. The patient does not have to be flown out of the village and the dangers of overuse of antibiotics can be prevented.

Human Genetics

The other major NLM component involved in research and development is the National Center for Biotechnology Information (NCBI). The Center designs and develops databases to store DNA sequence information and creates automated systems for managing and analyzing knowledge about molecular biology and genetics. The human genome contains the DNA code for building the body and maintaining the health of a human being. Included in the code, which consists of four chemical constituents represented by the letters "A," "T," "G," and "C," are the particulars for the creation of every protein we use. Since our proteins perform the work of our cells, and our cells build and maintain our bodies, the DNA sequence comprising the human genome contains vital clues for better understanding human health and disease.

With the release of the "working draft" of the human genome, the global research focus is turning from analysis of specific genes or gene regions to whole genomes, which refers to all of the genes found in cells and tissues. To accommodate this shift in research focus, NCBI has developed a suite of resources to support comprehensive analysis of the human genome and is thus a key component of the NIH Human Genome Project. The NCBI is responsible for all phases of the NIH GenBank database, a collection of all known DNA sequences. GenBank is growing rapidly with contributions received from scientists around the world and now contains more than 12 million sequences; it is accessed on the Web 200,000 times each day by approximately 50,000 researchers.

Scientists use not only the sequence data stored in GenBank, but avail themselves of the sophisticated computational tools developed by NCBI intramural investigators, such as the BLAST suite of programs for conducting comparative sequence analysis. The original BLAST program, released in 1990, has been used by many thousands of scientists around the world. It made it dramatically easier for researchers to rapidly scan huge sequence databases for similarities, and statistically evaluate the resulting matches. The papers describing BLAST have been among the most cited articles in all of science. The program has recently been improved by NCBI scientists to provide an even more powerful tool for characterizing novel protein sequences and inferring their function from previously studied gene products.

Another NCBI product, Entrez, is an integrated database search and retrieval system. It allows users to search enormous amounts of sequence and literature information with techniques that are fast and easy to use. Using this system, one can access NCBI's nucleotide, protein, mapping, taxonomy, genome, structure, and population studies databases, as well as MEDLINE/PubMed, the Web-based retrieval system for biomedical literature. The publicly accessible "Human Gene Map" is another example of an important analysis tool developed by NCBI researchers. GeneMap represents an outline of the draft human genome and contains the location of more than 35,000--about half--of all human genes. As the human genomic sequence data continues to accumulate and be made available in ingenious ways through the Web, we can expect discoveries that promise to lead to future medical breakthroughs.

NEW INITIATIVES

Bioinformatics Training

NLM's Extramural Programs Division has an important role in ensuring that the nation's biomedical research enterprise has the trained professionals it needs in computational biology, including mathematical modeling in the life sciences, advanced imaging, and molecular biology. This role was brought into focus in the report of the Working Group on Biomedical Computing, "The Biomedical Information Science and Technology Initiative" (BISTI). The BISTI initiative falls directly within the scope of the NLM's medical informatics training program under which the Library supports 12 training programs at universities across the nation for the express purpose of training experts to carry out research in general informatics and in the genome-related specialty of bioinformatics. The NLM has augmented each of the 12 training programs with a "BISTI supplement" of $200,000 to strengthen or initiate bioinformatics training within the program. NLM has also funded two planning grants that will lead to the development of what are called National Programs of Excellence in Biomedical Computing.

Toxicology and Environmental Health Information Program

There are other new initiatives at NLM, including those in the Toxicology and Environmental Health Information Program. After September 11, the Program quickly applied its expertise in the properties of chemical and hazardous substances and put up on the Web several useful sites, such as "lingering airborne hazards" and "chemical warfare." The Toxicology and Environmental Health Information Program has grown in the past 35 years to include an expanding array of information resources ("TOXNET") provided to a widening audience via continually improving computer-oriented technology. While the operational needs of this program are considerable, additional new program directions and activities will be developed in the years to come as the program strives to provide resources relevant and appropriate for the new information age.

For example, Geographic Information Systems technology will facilitate access to information that is particularly relevant to users at a specific location. Advanced indexing techniques will make it easier for users to find precisely the data they require in a timely manner. New structure display systems will help users select and compare chemical structures, and new links to numeric toxicity data will allow study of structure and activity relationships. Advanced presentation and search interfaces will enable diverse users to be directed to appropriate information resources. There will be a chemical spell checker (for those not fluent in chemical-talk). There will be an "In your city and town" graphic interface to enable the user to"walk through" a town and learn about common chemical substances in the environment and any associated health effects. These are but a few of the benefits anticipated from expanding the activities of the Toxicology and Environmental Health Information Program.

Ensuring the Collection for Future Generations

Despite the NLM's extensive involvement with computer and communications technology, the staff is ever mindful of its responsibility to maintain the integrity of the world's largest collection of medical books and journals. Increasingly, this information is in digital form, and the NLM, as

a national library responsible for preserving the scholarly record of biomedicine, is working with the Library of Congress and others to develop a strategy for selecting, organizing, and ensuring permanent access to digital information.

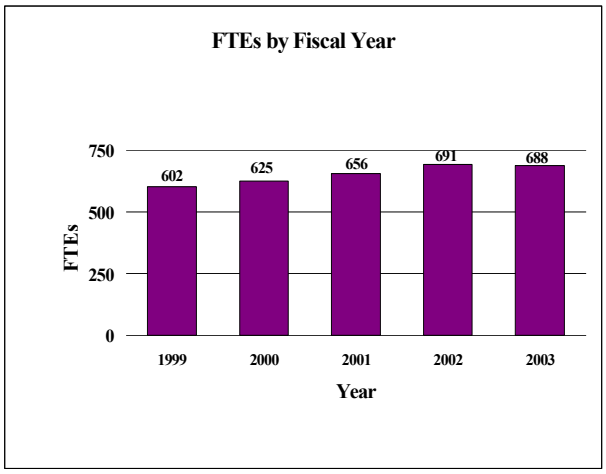
One innovation in this area is the remarkable "Turning the Pages" program installed at the NLM. The program, developed at the British Library, uses computer animation, high-quality digitized images, and touch-screen technology to simulate the action of leafing through the pages of a book. In addition to digitally turning the pages forward and back, one can zoom in on any portion of the text or picture; an audioclip then provides information about the section of the book selected. The first book in the U.S. to be converted with this technology is the NLM's copy of a lavishly illustrated eighteenth century herbal. Several more rare volumes will follow. It makes works come alive that would otherwise never be seen by the public.

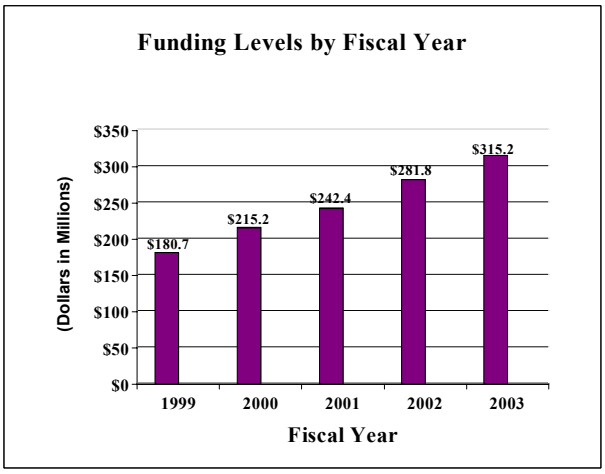
American medical science has never been more vigorous or more fruitful. The role of the National Library of Medicine in collecting, organizing, preserving, and making available the knowledge resulting from medical research is crucial. Regardless of the format in which the materials are received, ensuring that they will always be accessible to future generations remains the Library's highest priority.

NLM BUDGET POLICY

The FY 2003 budget request for the NLM is $315,163,000, including AIDS, an increase of $33,411,000 and 11.9% over the FY 2002 estimate.

A five year history of FTEs and Funding Levels for NLM is shown in the graphs below. Note that Fiscal Years 2000 and 1999 are not comparable for the Managerial Flexibility Act of 2001 legislative proposal.



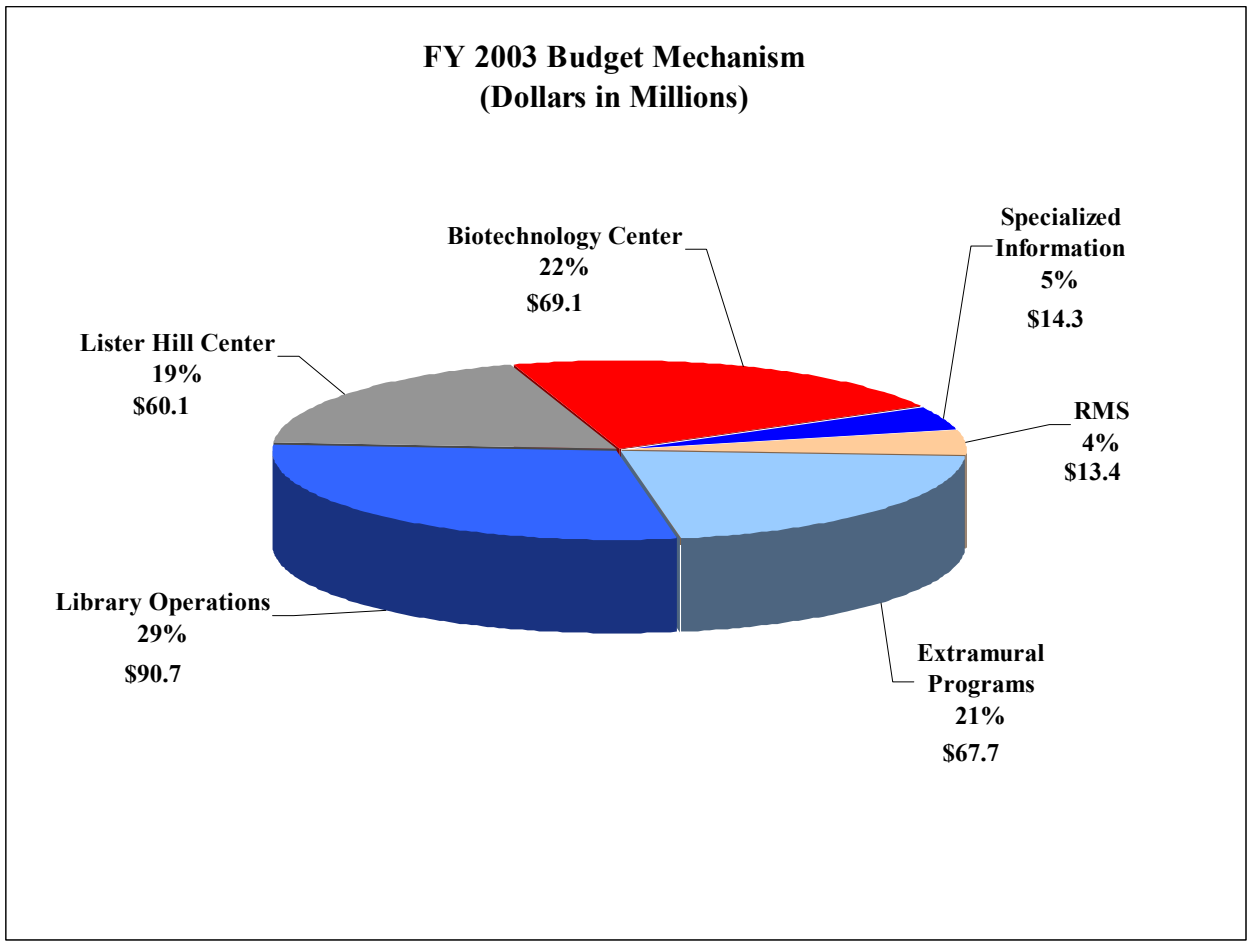


The request continues to support new health care applications; improve consumer health information; utilize advanced computer and communications technologies; emphasize support for library operations including literature acquisition, management, dissemination, and preservation; funds grants in Integrated Advanced Information Management Systems, training, medical informatics, biotechnology and other research and development activities.

Of the increase requested, $18.7 million is targeted towards special activities which include (1) Biomedical Information Science and Technology Initiative, (2) Consumer/Minority health, and (3) Genetics of Medicine–to accommodate the increased dataflow in sequencing, genetic and physical mapping of disease genes and links to information on specific gene functions.

The remaining funds are to support increased NLM management fund and service and supply funds costs, fundamental informatics research, and basic library services.

The FY 2003 budget request for NLM by budget activity is illustrated below:



NATIONAL INSTITUTES OF HEALTH

National Library of Medicine
TOTAL - Current Law
Budget Mechanism

MECHANISM	FY 2001 Actual		FY 2002 Appropriation		FY 2002 Current Estimate		FY 2003 Estimate	
	No.	Amount	No.	Amount	No.	Amount	No.	Amount
Grants:								
Noncompeting	144	$20,906,000	90	$16,957,000	90	$16,957,000	141	$30,470,000
Competing	66	13,708,000	99	27,109,000	99	27,109,000	62	19,480,000
SBIR/STTR	3	502,000	3	600,000	3	600,000	3	600,000
Subtotal, Grants	213	35,116,000	192	44,666,000	192	44,666,000	206	50,550,000
Contracts:								
Noncompeting	9	5,396,000	11	15,914,000	11	15,914,000	10	17,120,000
Competing	8	9,967,000	0	0	0	0	0	0
Subtotal, Contracts	17	15,363,000	11	15,914,000	11	15,914,000	10	17,120,000
Total, Extramural	230	50,479,000	203	60,580,000	203	60,580,000	216	67,670,000
	FTEs		FTEs		FTEs		FTEs	
Intramural Programs:								
Library Operations	350	71,733,000	354	78,484,000	354	78,484,000	353	88,163,000
Lister Hill Center	79	51,966,000	80	56,451,000	80	56,066,000	80	59,522,000
Biotechnology Center	101	43,530,000	123	58,238,000	123	58,238,000	123	68,238,000
Specialized Information	27	10,287,000	32	12,292,000	32	12,292,000	32	14,043,000
Total, Intramural	557	177,516,000	589	205,465,000	589	205,080,000	588	229,966,000
Research management and support	99	10,228,000	102	11,613,000	102	11,613,000	100	12,663,000
Total, NLM	656	238,223,000	691	277,658,000	691	277,273,000	688	310,299,000

NATIONAL INSTITUTES OF HEALTH

National Library of Medicine
TOTAL - Accrued Costs for Retirement and Health Benefits
Budget Mechanism

MECHANISM	FY 2001 Actual		FY 2002 Appropriation		FY 2002 Current Estimate		FY 2003 Estimate	
	No.	Amount	No.	Amount	No.	Amount	No.	Amount
Grants:								
Noncompeting								
Competing								
SBIR/STTR								
Subtotal, Grants								
Contracts:								
Noncompeting								
Competing								
Subtotal, Contracts								
Total, Extramural								
	FTEs		FTEs		FTEs		FTEs	
Intramural Programs:								
Library Operations		2,228,000		2,295,000		2,295,000		2,495,000
Lister Hill Center		502,000		519,000		519,000		566,000
Biotechnology Center		643,000		797,000		797,000		870,000
Specialized Information		171,000		207,000		207,000		226,000
Total, Intramural		3,544,000		3,818,000		3,818,000		4,157,000
Research management and support		631,000		661,000		661,000		707,000
Total, NLM		4,175,000		4,479,000		4,479,000		4,864,000

NATIONAL INSTITUTES OF HEALTH

National Library of Medicine
TOTAL - Proposed Law
Budget Mechanism

MECHANISM	FY 2001 Actual		FY 2002 Appropriation		FY 2002 Current Estimate		FY 2003 Estimate	
	No.	Amount	No.	Amount	No.	Amount	No.	Amount
Grants:								
Noncompeting	144	$20,906,000	90	$16,957,000	90	$16,957,000	141	$30,470,000
Competing	66	13,708,000	99	27,109,000	99	27,109,000	62	19,480,000
SBIR/STTR	3	502,000	3	600,000	3	600,000	3	600,000
Subtotal, Grants	213	35,116,000	192	44,666,000	192	44,666,000	206	50,550,000
Contracts:								
Noncompeting	9	5,396,000	11	15,914,000	11	15,914,000	10	17,120,000
Competing	8	9,967,000	0	0	0	0	0	0
Subtotal, Contracts	17	15,363,000	11	15,914,000	11	15,914,000	10	17,120,000
Total, Extramural	230	50,479,000	203	60,580,000	203	60,580,000	216	67,670,000
	FTEs		FTEs		FTEs		FTEs	
Intramural Programs:								
Library Operations	350	73,961,000	354	80,779,000	354	80,779,000	353	90,658,000
Lister Hill Center	79	52,468,000	80	56,970,000	80	56,585,000	80	60,088,000
Biotechnology Center	101	44,173,000	123	59,035,000	123	59,035,000	123	69,108,000
Specialized Information	27	10,458,000	32	12,499,000	32	12,499,000	32	14,269,000
Total, Intramural	557	181,060,000	589	209,283,000	589	208,898,000	588	234,123,000
Research management and support	99	10,859,000	102	12,274,000	102	12,274,000	100	13,370,000
Total, NLM	656	242,398,000	691	282,137,000	691	281,752,000	688	315,163,000

NATIONAL INSTITUTES OF HEALTH

National Library of Medicine
Budget Authority by Activity 1/
(dollars in thousands)

ACTIVITY	FY 2001 Actual		FY 2002 Estimate		FY 2003 Estimate		Change	
	FTEs	Amount	FTEs	Amount	FTEs	Amount	FTEs	Amount
Extramural Programs:								
Medical Library Assistance		$28,597		$33,896		$38,862		$4,966
PHS 301		21,380		26,084		28,208		2,124
SBIR/STTR		502		600		600		0
Subtotal, Extramural		50,479		60,580		67,670		7,090
Intramural Programs:								
Library Operations	350	73,961	354	80,779	353	90,658	(1)	9,879
Lister Hill Center	79	52,468	80	56,585	80	60,088	0	3,503
Biotechnology Center	101	44,173	123	59,035	123	69,108	0	10,073
Specialized Information	27	10,458	32	12,499	32	14,269	0	1,770
Subtotal, Intramural	557	181,060	589	208,898	588	234,123	(1)	25,225
Research managament and suppor	99	10,859	102	12,274	100	13,370	(2)	1,096
Total	656	242,398	691	281,752	688	315,163	(3)	33,411

1/ Please see the following tables for the crosswalk from current law to proposed law to reflect the administration's proposal for full accrued retirement and health benefits.

National Institutes of Health

National Library of Medicine

2001 Crosswalk for Accrued Retirement and Health Benefit Costs
(Dollars in thousands)

	2001 Actual Current Law	2001 Additional Accrual Costs	2001 Actual Proposed Law
Extramural Research:	$50,479	$0	$50,479
Subtotal, extramural research	50,479	0	50,479
Intramural Research	177,516	3,544	181,060
Research management and support	10,228	631	10,859
Total	238,223	4,175	242,398

National Institutes of Health

National Library of Medicine

2002 Crosswalk for Accrued Retirement and Health Benefit Costs
(Dollars in thousands)

	2002 Appropriation Current Law	2002 Additional Accrual Costs	2002 Appropriation Proposed Law
Extramural Research:	$60,580	$0	$60,580
Subtotal, extramural resarch	60,580	0	60,580
Intramural Research	205,080	3,818	208,898
Research management and support	11,613	661	12,274
Total	277,273	4,479	281,752

National Institutes of Health

National Library of Medicine

2003 Crosswalk for Accrued Retirement and Health Benefit Costs
(Dollars in thousands)

	2003 Estimate Current Law	2003 Additional Accrual Costs	2003 Estimate Proposed Law
Extramural Research:			
	$67,670	$0	$67,670
Subtotal, extramural research	67,670	0	67,670
Intramural Research	229,966	4,157	234,123
Research management and support	12,663	707	13,370
Total	310,299	4,864	315,163

NATIONAL INSTITUTES OF HEALTH

National Library of Medicine
Summary of Changes

2002 Estimated budget authority				$281,752,000
2003 Estimated budget authority				315,163,000
Net change				33,411,000
	2002 Current Estimate Base		Change from Base	
CHANGES	FTEs	Budget Authority	FTEs	Budget Authority
A. Built-in:				
1. Intramural research:				
a. Within grade increase		$53,428,000		$870,000
b. Annualization of January 2002 pay increase		53,428,000		611,000
c. January 2003 pay increase		53,428,000		990,000
d. Payment for centrally furnished services		7,618,000		686,000
e. Increased cost of laboratory supplies, materials, and other expenses		147,852,000		4,038,000
f. Accrued costs for retirement and health benefits		3,818,000		339,000
Subtotal				7,534,000
2. Research Management and Support:				
a. Within grade increase		8,746,000		141,000
b. Annualization of January 2002 pay increase		8,746,000		99,000
c. January 2003 pay increase		8,746,000		163,000
d. Payment for centrally furnished services		466,000		42,000
e. Increased cost of laboratory supplies, materials, and other expenses		3,062,000		137,000
f. Accrued costs for retirement and health benefits		661,000		46,000
Subtotal				628,000
Subtotal, Built-in				8,162,000

NATIONAL INSTITUTES OF HEALTH

National Library of Medicine
Summary of Changes--continued

CHANGES	2002 Current Estimate Base		Change from Base	
	No.	Amount	No.	Amount
B. Program:				
1. Grants:				
a. Noncompeting	90	16,957,000	51	13,513,000
b. Competing	99	27,109,000	(37)	(7,629,000)
c. SBIR/STTR	3	600,000	0	0
Total	192	44,666,000	14	5,884,000
2. Contracts	11	15,914,000	(1)	1,206,000
Subtotal, extramural	203	60,580,000	13	7,090,000
	FTEs		FTEs	
3. Intramural programs	589	208,898,000	(1)	17,691,000
4. Research management and support	102	12,274,000	(2)	468,000
Subtotal, program	691	221,172,000	(3)	18,159,000
Total changes	691		(3)	33,411,000

NATIONAL INSTITUTES OF HEALTH

National Library of Medicine
Budget Authority by Object

	FY 2002 Appropriation	FY 2002 Current Estimate	FY 2003 Estimate	Increase or Decrease
Total compensable workyears:				
Full-time employment	691	691	688	(3)
Full-time equivalent of overtime and holiday hours	0	0	0	0
Average ES salary	$135,997	$135,997	$139,533	$3,536
Average GM/GS grade	10.2	10.2	10.2	0.0
Average GM/GS salary	$59,433	$59,433	$60,978	$1,545
Average salary, grades established by act of July 1, 1944 (42 U.S.C. 207)	$77,112	$77,112	$79,117	$2,005
Average salary of ungraded positions	$91,847	$91,847	$94,235	$2,388

	OBJECT CLASSES	FY 2002 Appropriation	FY 2002 Estimate	FY 2003 Estimate	Increase or Decrease
	Personnel Compensation:				
11.1	Full-Time Permanent	$35,707,000	$35,707,000	$37,489,000	$1,782,000
11.3	Other than Full-Time Permanent	9,916,000	9,916,000	10,410,000	494,000
11.5	Other Personnel Compensation	1,799,000	1,799,000	1,889,000	90,000
11.8	Special Personnel Services Payments	1,131,000	1,131,000	1,187,000	56,000
11.9	**Total Personnel Compensation**	**48,553,000**	**48,553,000**	**50,975,000**	**2,422,000**
12.1	Personnel Benefits	10,574,000	10,574,000	11,102,000	528,000
12.1	Personnel Benefits, Accrued Retirement Costs	3,047,000	3,047,000	3,405,000	358,000
13.0	Benefits for Former Personnel	0	0	0	0
	Subtotal, Pay Cost, Current Law	**59,127,000**	**59,127,000**	**62,077,000**	2,950,000
	Subtotal, Pay Cost, Proposed Law	**62,174,000**	**62,174,000**	**65,482,000**	**3,308,000**
21.0	Travel and Transportation of Persons	1,078,000	1,078,000	1,097,000	19,000
22.0	Transportation of Things	113,000	113,000	115,000	2,000
23.1	Rental Payments to GSA	2,000	2,000	2,000	0
23.2	Rental Payments to Others	18,000	18,000	18,000	0
23.3	Communications, Utilities and Miscellaneous Charges	1,508,000	1,508,000	1,535,000	27,000
24.0	Printing and Reproduction	1,343,000	1,343,000	1,367,000	24,000
25.1	Consulting Services	25,754,000	25,754,000	26,218,000	464,000
25.2	Other Services	56,430,000	56,045,000	65,773,000	9,728,000
25.3	Purchase of Goods and Services from Government Accounts	36,478,000	36,478,000	41,638,000	5,160,000
25.3	Accrued Retirement Costs	1,432,000	1,432,000	1,459,000	27,000
25.4	Operation and Maintenance of Facilities	738,000	738,000	751,000	13,000
25.5	Research and Development Contracts	19,342,000	19,342,000	24,582,000	5,240,000
25.6	Medical Care	0	0	0	0
25.7	Operation and Maintenance of Equipment	11,069,000	11,069,000	11,268,000	199,000
25.8	Subsistence and Support of Persons	0	0	0	0
25.0	**Subtotal, Other Contractual Services, Current Law**	**149,811,000**	**149,426,000**	**170,230,000**	**20,804,000**
25.0	**Subtotal, Other Contractual Services, Proposed Law**	**151,243,000**	**150,858,000**	**171,689,000**	**20,831,000**
26.0	Supplies and Materials	2,109,000	2,109,000	2,147,000	38,000
31.0	Equipment	17,873,000	17,873,000	21,151,000	3,278,000
32.0	Land and Structures	0	0	0	0
33.0	Investments and Loans	0	0	0	0
41.0	Grants, Subsidies and Contributions	44,666,000	44,666,000	50,550,000	5,884,000
42.0	Insurance Claims and Indemnities	0	0	0	0
43.0	Interest and Dividends	10,000	10,000	10,000	0
44.0	Refunds	0	0	0	0
	Subtotal, Non-Pay Costs, Current Law	**218,531,000**	**218,146,000**	**248,222,000**	**30,076,000**
	Subtotal, Non-Pay Costs, Proposed Law	**241,022,000**	**240,637,000**	**271,120,000**	**30,483,000**
	Total Budget Authority by Object, Current	**277,658,000**	**277,273,000**	**310,299,000**	**33,026,000**
	Total Budget Authority by Object, Proposed	**303,196,000**	**302,811,000**	**336,602,000**	**33,791,000**
	Total Accrued Retirement Costs	**4,479,000**	**4,479,000**	**4,864,000**	**385,000**

NATIONAL INSTITUTES OF HEALTH

National Institute of
Salaries and Expenses

OBJECT CLASSES	FY 2002 Appropriation	FY 2002 Current Estimate	FY 2003 Estimate	Increase or Decrease
Personnel Compensation:				
Full-Time Permanent (11.1)	$35,707,000	$35,707,000	$37,489,000	$1,782,000
Other Than Full-Time Permanent (11.3)	9,916,000	9,916,000	10,410,000	494,000
Other Personnel Compensation (11.5)	1,799,000	1,799,000	1,889,000	90,000
Special Personnel Services Payments (11.8)	1,131,000	1,131,000	1,187,000	56,000
Total Personnel Compensation (11.9)	**48,553,000**	**48,553,000**	**50,975,000**	**2,422,000**
Civilian Personnel Benefits (12.0)	10,574,000	10,574,000	11,102,000	528,000
Accrued Costs of Retirement Benefits (12.1)	3,047,000	3,047,000	3,405,000	358,000
Benefits to Former Personnel (13.0)	0	0	0	0
Subtotal, Pay Costs, Current Law	**59,127,000**	**59,127,000**	**62,077,000**	**2,950,000**
Subtotal, Pay Costs, Proposed Law	**62,174,000**	**62,174,000**	**65,482,000**	**3,308,000**
Travel (21.0)	1,078,000	1,078,000	1,097,000	19,000
Transportation of Things (22.0)	113,000	113,000	115,000	2,000
Rental Payments to Others (23.2)	18,000	18,000	18,000	0
Communications, Utilities and Miscellaneous Charges (23.3)	1,508,000	1,508,000	1,535,000	27,000
Printing and Reproduction (24.0)	1,343,000	1,343,000	1,367,000	24,000
Other Contractual Services:				
Advisory and Assistance Services (25.1)	25,754,000	25,754,000	26,218,000	464,000
Other Services (25.2)	56,430,000	56,045,000	65,773,000	9,728,000
Purchases from Govt. Accounts (25.3)	23,594,000	23,594,000	29,269,000	5,675,000
Accrued Retirement Costs (25.3)	1,432,000	1,432,000	1,459,000	27,000
Operation & Maintenance of Facilities (25.4)	738,000	738,000	751,000	13,000
Operation & Maintenance of Equipment (25.7)	11,069,000	11,069,000	11,268,000	199,000
Subsistence & Support of Persons (25.8)	0	0	0	0
Subtotal, Other Contractual Services, Current Law	**117,585,000**	**117,200,000**	**133,279,000**	**16,079,000**
Subtotal, Other Contractual Services, Proposed Law	**119,017,000**	**118,632,000**	**134,738,000**	**16,106,000**
Supplies and Materials (26.0)	2,109,000	2,109,000	2,147,000	38,000
Subtotal, Non-Pay Costs, Current Law	**123,754,000**	**123,369,000**	**139,558,000**	**16,189,000**
Subtotal, Non-Pay Costs, Proposed Law	**125,186,000**	**124,801,000**	**141,017,000**	**16,216,000**
Total, Administrative Costs, Current Law	**182,881,000**	**182,496,000**	**201,635,000**	**19,139,000**
Total, Accrued Costs	**4,479,000**	**4,479,000**	**4,864,000**	**385,000**
Total, Administrative Costs, Proposed Law	**187,360,000**	**186,975,000**	**206,499,000**	**19,524,000**

NATIONAL INSTITUTES OF HEALTH

National Library of Medicine

SIGNIFICANT ITEMS IN HOUSE, SENATE, AND CONFERENCE APPROPRIATIONS COMMITTEE REPORTS

FY 2002 House Appropriations Committee Report Language (H. Rpt. 107-229)

Item

Access to Health Information in Rural Areas – The Committee is concerned about challenges related to access to health information in rural and other medically underserved areas and supports the Library's efforts to address this through its Internet Connection Grant program, which provides resources for education of consumers and health care professionals by partnering with regional libraries to provide hardware, training and access to the Internet at locations in medically underserved areas. (p. 89)

Action taken or to be taken

Enhancing access to health information in rural and other medically underserved areas is a primary goal of NLM's National Network of Libraries of Medicine (NN/LM) program. Over the past 10 years, the Regional Medical Libraries and other NN/LM member libraries have used outreach funding provided by NLM to provide hardware, training, and access to health information in small rural hospitals, inner city clinics, and remote tribal communities. Between 1993 and 1999, the percentage of hospital libraries in the U.S. with Internet connections increased from 24% to 91%, in part due to these special efforts. To complement the efforts of the Regional Medical Libraries, NLM has created three grant programs, each of which is designed to help hospitals, clinics, and health science libraries in underserved areas obtain access to health information through information technology. The Connections Program provides funds for setting up an Internet Connection; the Access Program provides funds for equipment and training necessary to establish basic health information systems capable of linking health care providers and information sources in a region; the Information Systems Program is available for more ambitious projects that usually are concerned with complex information and complex systems, and may be used for areas as large as a state. Of these the first two programs are almost exclusively directed to underserved areas, primarily rural. The Systems grants are commonly used for such regions.

A study of the Connections Program, completed in 2000, indicated that almost 100% of those who received NLM starter grants for Internet connection continued the connection with their own funds in subsequent years. Further, despite the marked increase in use of information technology in the U.S., many facilities, particularly in underserved areas, are still without access to the WEB or to other information sources. There is still significant need for access improvement programs, and NLM intends to support these programs strongly. Because the ones who need help most are often least likely to be aware of NLM's programs, NLM in FY 2001

made a significant effort to publicize the existence of the grant programs in the appropriate venues, resulting in a marked increase in applications and awards. In FY 2002 the application process will be simplified to better meet the needs of applicants not familiar with NIH procedures.

Item

Bioethics – The Committee commends NLM for its work over the past 15 years in support of information retrieval in bioethics. As public policy debates today increasingly include in depth discussion of the bioethical aspects of topics such as the oversight of human experimentation, stem cell research, cloning and privacy issues surrounding health and genetic records, the Committee encourages NLM to maintain and build on this important work through all available mechanisms, as appropriate, including the cooperative relationship with the Kennedy Institute of Ethics. (p. 89)

Action taken or to be taken

Ethical issues in health care and research produce an enormous literature. This literature comes from law, medicine, public health, and government. The National Reference Center for Bioethics Literature at Georgetown University continues to offer invaluable resources and guidance for professionals and consumers interested in aspects of this field. An NLM contract maintains the Center. A complementary contract from Library Operations supports an indexing activity that contributes to BIOETHICSLINE, one of NLM's online databases. NLM also encourages public discussion of ethical issues in medicine through its History of Medicine Division. In FY 2002, in conjunction with the American Library Association, NLM will tour its highly successful exhibition, "Frankenstein: Penetrating the Secrets of Nature." The exhibition explores the nexus of social and scientific issues.

Item

Minority Outreach – The Committee encourages NLM to support initiatives to strengthen information technology infrastructure at minority health professions schools that focus their research efforts on health disparities and educating health professionals who serve in medically underserved communities through all available mechanisms, as appropriate. (p. 89/90)

Action taken or to be taken

In 1991 the National Library of Medicine initiated the Toxicology Information Outreach Project (TIOP). Its mission was to strengthen the capacity of Historically Black Colleges and Universities (HBCUs) to train health professionals to use NLM's Toxicology and Environmental Health Information Program databases. In the ten years since its inception, the project has strengthened the link between NLM and HBCUs to a point where by the year 2000 nearly 80 minority institutions have received training under the TIOP program. The initiative has also grown in breadth and scope as well as in size. In addition to its initial focus on toxicology and environmental health, other health disparities have been added representing a broader perspective of minority health. Training includes the use of electronic health information

resources and services with the goal of promoting their integration into the curriculum and their use for research. The colleges and universities comprising TIOP are those with graduate programs in medicine, nursing and other health sciences. TIOP was recently expanded to include representation from a Hispanic serving educational institution and a tribal college. NLM will be using these schools as conduits to work with these communities, including promoting quality Internet connectivity and the use of technology for research and education.

NLM's grant programs have several initiatives in support of minority outreach. The Informatics Research Training programs are supported by NLM at 12 Universities, and will grow to 18 Universities at the end of FY 2002. Applicants competing for these grants were informed that involvement of HBCU or other minority organizations in the training program was highly desirable and would be given extra scoring weight when the applications were reviewed. As a result both Drew and Meharry will be partners in the next round of applications to be funded. In addition, NLM will continue to participate in the NIH Supplement Award Program for Underrepresented Minorities.

NLM's grant programs specifically designed to improve information technology infrastructure, discussed above in connection with rural outreach initiatives, are also well suited to minority health profession schools. Because few have applied in the past, a specific effort will be made in FY 2002 to make minority health professions schools aware of these programs and the application process.

NLM's most complex information infrastructure grant program, Integrated Advanced Information Management Systems (IAIMS), has traditionally made awards to large research universities. This program is currently being revised in order to facilitate awards to smaller professional schools who need assistance in setting up essential networks and in planning for orderly growth of the organization's information systems.

Item

PubMed Central – PubMed Central is an electronic online repository for life sciences articles and holds promise for increasing access to health care literature by health professionals, students, educators, researchers and the general public. The Committee encourages NLM to work with the
medical library community, including health sciences librarians, regarding issues related to copyright, fair use, peer-review and classification of information on PubMed Central. (p. 90)

Action taken or to be taken

NLM considers interaction and input from the medical library community essential for the development and continued success of PubMed Central. A national committee has been established to advise the Directors of NIH, NLM, and the National Center for Biotechnology Information on the content and operation of the PubMed Central project. A primary charge of the committee is to ensure that PubMed Central remains responsive to the needs of researchers,

librarians, publishers, and the general public. Medical librarians are represented on the committee by Michael Homan, Director of Libraries for the Mayo Medical Center, and president of the Medical Library Association. Mr. Homan, as well as the other thirteen members of the advisory committee, most of whom are members of the biomedical academic community, are well-informed on the issues of copyright, fair use, and peer review and interact regularly with the medical librarians at their home institutions. The committee meets twice a year and would welcome any interested participants from the medical library community to attend. In addition to the advisory committee, community interaction with the NCBI's PubMed Central development team (which includes medical librarians) is always welcome. NCBI also partners with medical libraries in its outreach efforts. For example, NCBI convened a working group in January 2001 with representatives of six medical libraries to examine how NCBI's services, including PubMed Central, are meeting their needs.

FY 2002 Senate Appropriations Committee Report Language (S. Rpt. 107-84)

Item

Bioethical issues **–** Since 1985, the NLM has undertaken important work in support of information retrieval in bioethics and has established an effective and cooperative relationship with the National Reference Center for Bioethics Literature at the Georgetown University-based Kennedy Institute of Ethics. As public policy debates today increasingly include in-depth discussion of the bioethical aspects of topics such as the oversight of human experimentation, stem cell research, cloning and privacy issues surrounding health and genetic records, the Committee is particularly aware of the importance of the work begun through this partnership. The Committee encourages the NLM and the Kennedy Institute of Ethics to maintain and build upon this important work. (p. 178)

Action taken or to be taken

Please refer to page NLM-30 of this document for NLM's response to this significant item regarding Bioethical Issues.

Item

Home Medical Consultations - The Committee expects NLM to provide sufficient funds for a demonstration to test the use of state-of-the art telemedicine technology for home medical consultations. This innovative approach holds great promise for improving the care and lowering health care costs for home-bound individuals who require frequent monitoring. (p. 178)

Action taken or to be taken

The National Library of Medicine (NLM) has been supporting a variety of telemedicine initiatives including innovative projects in home medical consultation. NLM has been funding a model project at the University of Iowa in cooperation with the Iowa Department of Public Health to develop tele-home health care as a vehicle for enhancing the delivery of medical care.

It is anticipated that the Iowa prototype could then be deployed in similar rural or underserved areas. Initially the impact of tele-home health care on preventive care, monitoring of "at-risk" patients, acute care, and chronic illness management is being assessed. The feasibility of deploying a state-wide tele-home health care project will be explored.

In addition, Columbia University used telemedicine technology to provide disease prevention and chronic illness management information to patients at home. Patients entered blood pressures, glucose levels and pulmonary function test results into an electronic medical record using applications which ran on home-based personal computers connected to the Internet. Patients received alerts and reminders when their individual goals for immunization, diabetes management and asthma control were not achieved. The project demonstrated techniques to safeguard the confidentiality of electronic personal health care records.

Item

PubMed Central – The Committee commends NLM for its leadership in developing PubMed Central, an electronic online repository for life sciences articles. PubMed Central holds great promise for increasing access to health care literature by health professionals, students, educators, researchers and the general public. The Committee encourages NLM to work with the
medical library community regarding issues related to copyright, fair use, peer-review and classification of information on PubMed Central. (p. 178/179)

Action taken or to be taken

Please refer to page NLM-31 of this document for NLM's response to this significant item regarding PubMed Central.

Item

Senior citizen outreach – The Committee again notes that senior citizens would benefit greatly from expanded access to NLM's databases, and it therefore expects NIH to provide sufficient funds for a demonstration of a different means to that end, such as including Internet access at senior centers and congregate meal sites. The Committee expects to be briefed on NLM's progress in this area. (p. 179)

Action taken or to be taken

NLM's interest in reaching seniors is fueled by the finding that Americans over the age of 65 are twice as likely to be hospitalized and to incur over 50% of all health care costs. For these reasons, older Americans would benefit greatly by increased access to reliable and timely health information via the Internet.

The NLM also recognizes that making health information on the Internet easily available to all citizens -- especially older Americans who lack either the necessary computer skills or access to computing equipment -- is critical. NLM's interest is fueled in part by the fact that more and

more older people are using the Internet as a source of health information. In fact, according to The Media Audit, the over 50s are now the fastest growing part of the US Internet audience. Internet users in this age group grew from 19 percent in 1997 to 38 percent of all users in 2000.

To better serve the growing needs of seniors for credible health and to provide that information in a format that is compatible with the cognitive, visual and perceptual changes that occur with age, the NLM and the National Institute on Aging (NIA) have developed NIHSeniorHealth.gov. This new web site will be beta-tested early in 2002 and launched shortly thereafter. NIHSeniorHealth.gov will serve as an entry point to MEDLINEplus for seniors as well as a distance learning site specially geared to older populations. To assist other web site creators in making their Internet sites more senior-friendly, the NLM and NIA produced *"Making Your Web Site Senior Friendly"* -- a checklist for web site design that helps make sites more accessible to all adults.

The NLM recognizes the need to support innovative methods for reaching and training seniors to access health information via the Internet. Together with the US Department of Agriculture Extension Service, the Andrus Foundation, and Microsoft, the NLM is supporting *Cyber Seniors/Cyber Teens* – a pilot project in Virginia and Maine in which 4-H youth working with adult mentors will provide: the training to get seniors online and to web sites such as MEDLINEplus; the computer skills to help seniors find the online health information they need; the knowledge base for seniors to properly use web-based health information and weigh the accuracy, reliability, and timeliness of web content; and, the tools for seniors to use the Internet to reach out to others dealing with similar health and/or wellness issues. If the pilot project is successful, it is anticipated that the *Cyber Seniors/Cyber Teens* concept may be replicated in other geographic areas.

Lastly, together with its National Network of Libraries of Medicine, the NLM is exploring ways in which access to health information might be made more readily available to seniors by: developing an online training curriculum for use by senior center directors, among others; and, funding innovative community outreach projects between medical and public libraries and local service agencies such as area agencies on aging, senior centers and congregate meal sites, and faith-based organizations.

FY 2002 Senate Appropriations Committee Report Language (S. Rpt. 107-84)

Item

Home Medical Consultations - The Committee expects NLM to provide sufficient funds for a demonstration to test the use of state-of-the art telemedicine technology for home medical consultations. This innovative approach holds great promise for improving the care and lowering health care costs for home-bound individuals who require frequent monitoring. (p. 178)

Action taken or to be taken

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initiatives including innovative projects in home medical consultation. NLM has been funding a model project at the University of Iowa in cooperation with the Iowa Department of Public Health to develop tele-home health care as a vehicle for enhancing the delivery of medical care. It is anticipated that the Iowa prototype could then be deployed in similar rural or underserved areas. Initially the impact of tele-home health care on preventive care, monitoring of "at-risk" patients, acute care, and chronic illness management is being assessed. The feasibility of deploying a state-wide tele-home health care project will be explored.

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FY 2002 Conference Appropriations Committee Report Language (C. Rpt. 107-342)

Item

Public and Private Coordination of Web-based Medical Technology -- The conferees encourage the Secretary, in conjunction with the CDC and relevant NIH institutes, to work with interested members of the physician community to provide nationwide access to a physician-only multi-media internet site. The conferees are aware of such sites with webcast experience, media response capability, and original content developed by nationally recognized medical faculty. Access to this web-based technology, which should function in conjunction with Federal health agencies' information systems, will allow the nation's primary care providers to receive important Federal health news and alerts as well as up to date information on treatment protocols for biological threats (p. 112).

Action taken or to be taken

In the post September 11 world, when life-saving information about biological threats may be needed at a moment's notice, it is vital that this Department have web-based information resources widely available to physicians. Although HHS does not sponsor a physicians-only information service, our agencies are ready to and enthused about cooperating with private efforts, including those that provide multimedia capabilities. We are pleased that many existing private services already provide physician access to selected HHS information services, such as the National Library of Medicine's MEDLINE. MEDLINE makes the entire body of important medical literature available to physicians 24 hours a day.

Many private organizations also point to NLM's MEDLINEplus. This service is directed to *both* doctors and patients. It is an extensive web-based collection of consumer health information from various authoritative sources on a wide variety of health topics, including biological threats, and it also links the public and their physicians to some 6,000 clinical trials. As MEDLINEplus expands to include audio and video information, HHS keeps uppermost in mind the technological challenges of ensuring access for users of different computer platforms and for those who do not have high-speed Internet connections.

Additionally, another HHS based health information services is HealthFinder, which links physicians and the public to many departmental information sources. There are also web-based information resources, including Federal health news and physician alert services, that are sponsored by the Food and Drug Administration, Centers for Disease Control and Prevention, and other NIH institutes. These agencies also cooperate with non-government information services. CDC also encourages States under their Health Alert Network and Bioterrorism grants to establish communication avenues with hospitals and doctors.

NATIONAL INSTITUTES OF HEALTH

National Library of Medicine
Authorizing Legislation

	PHS Act/ Other Citation	U.S. Code Citation	2001 Amount Authorized	2002 Estimate	2003 Amount Authorized	2003 Budget Estimate 1/
Research and Investigation	Section 301	42§241	Indefinite	281,752,000	Indefinite	315,163,000
National Library of Medicine	Section 417B	42§285	Indefinite		Indefinite	
National Research Service Awards	Section 487(d)	42§288	a/		b/	
Total, Budget Authority				281,752,000		315,163,000

a/ Funding provided under the Departments of Labor, Health and Human Services, Education, and Related Agencies Appropriations Act, 2002 (P.L. 107-116).

b/ Reauthorizing legislation will be submitted.

1/ Reflects proposed transfer from the National Cancer Institute

NATIONAL INSTITUTES OF HEALTH

National Library of Medicine
Appropriation History

Fiscal Year	Budget Estimate to Congress	House Allowance	Senate Allowance	Appropriation 1/
1994	$133,349,000	$118,481,000	$120,481,000	$118,019,000
1995	135,330,000	123,274,000	127,274,000	126,303,000 2/
1996 3/	136,311,000	138,277,000	136,781,000	141,439,000
Rescission				(257,000)
1997	143,268,000 3/	146,738,000	145,164,000 3/	151,103,000 4/
1998	152,689,000 3/	161,171,000	159,411,000 3/	161,185,000
1999	170,738,000 3/	176,492,000	181,309,000	180,742,000
Rescission				(120,000)
2000	185,654,000 3/	202,027,000	210,183,000	215,214,000
Rescission				(1,146,000)
2001	230,135,000 3/	256,281,000	256,953,000	246,801,000
Rescission				(399,000)
2002	275,725,000	273,610,000	281,584,000	277,658,000
Rescission				(385,000)
2003	315,163,000			

1/ Reflects enacted supplementals, rescissions and reappropriations.
2/ Excludes enacted administrative reductions of $526,000.
3/ Excludes funds for HIV/AIDS research activities consolidated in the NIH Office of AIDS Research.
4/ Excludes enacted administrative reductions of $275,000.

NATIONAL INSTITUTES OF HEALTH

National Library of Medicine
Detail of Full-Time Equivalent Employment (FTEs)

OFFICE/DIVISION	FY 2001 Actual	FY 2002 Estimate	FY 2003 Estimate
Division of Library Operations	350	354	353
Lister Hill Nat'l. Ctr. For Biomedical Comm.	79	80	80
National Center for Biotechnology Info.	101	123	123
Div. of Specialized Information Services	27	32	32
Office of the Director	29	29	29
Office of Administration and Management	54	54	52
Division of Extramural Programs	16	19	19
Total, NLM	656	691	688

Statutorily-ceiling exempt FTEs not included above

Funds to support these FTEs are provided by Cooperative Research and Development

FISCAL YEAR	Average GM/GS Grade
1999	10.2
2000	10.3
2001	10.2
2002	10.2
2003	10.2

NATIONAL INSTITUTES OF HEALTH

National Library of Medicine
Detail of Positions

GRADE	FY 2001 Actual	FY 2002 Estimate	FY 2003 Estimate
ES-6	0	0	0
ES-5	0	1	1
ES-4	2	3	3
ES-3	1	1	1
ES-2	2	2	2
ES-1	1	1	1
Subtotal	**6**	**8**	**8**
Total - ES Salary	$771,042	$1,087,976	$1,116,263
GM/GS-15	29	29	29
GM/GS-14	45	46	46
GM/GS-13	94	98	97
GS-12	144	150	148
GS-11	43	43	43
GS-10	3	3	3
GS-9	29	37	37
GS-8	80	80	80
GS-7	37	40	40
GS-6	11	11	11
GS-5	10	10	10
GS-4	37	37	37
GS-3	16	16	16
GS-2	7	7	7
GS-1	4	4	4
Subtotal	**589**	**611**	**608**
Grades established by Act of July 1, 1944 (42 U.S.C. 207):			
Assistant Surgeon General			
Director Grade	2	2	2
Senior Grade	1	1	1
Full Grade			
Senior Assistant Grade			
Subtotal	3	3	3
Ungraded	98	104	104
Total permanent positions	541	563	560
Total positions, end of year	696	726	720
Total full-time equivalent (FTE) employment,end of year	656	691	688