DEPARTMENT OF HEALTH AND HUMAN SERVICES

NATIONAL INSTITUTES OF HEALTH

National Library of Medicine

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, $316,040,000, of which $4,000,000 shall be available until expended for improvement of information systems: Provided, That in fiscal year 2004 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.

National Institutes of Health
National Library of Medicine

Amounts Available for Obligation 1/

Source of Funding	FY 2002 Actual	FY 2003 Amended President's Budget	FY 2004 Estimate
Appropriation	$277,658,000	$307,556,000	$316,040,000
Enacted Rescissions	(1,567,000)	(0)	---
Subtotal, Adjusted Appropriation	276,091,000	307,556,000	316,040,000
Real transfer to:			
Other HHS Agencies through Secretary's one-percent transfer authority	(299,000)	(0)	(0)
Comparative transfer from:			
Fogarty International Center for International Services Branch	13,000	13,000	0
Comparative transfer to:			
Office of the Director for program changes	(1,521,000)	(1,642,000)	(0)
National Institute of Biomedical Imaging and Bioengineering	(0)	(0)	(0)
Subtotal, adjusted budget authority	274,284,000	305,927,000	316,040,000
Unobligated Balance, start of year	0	300,725	0
Unobligated Balance, end of year	(300,725)	0	0
Subtotal, adjusted budget authority	273,983,275	306,227,725	316,040,000
Unobligated balance lapsing	(96,699)	---	---
Total obligations	273,886,576	306,227,725	316,040,000

1/ Excludes the following amounts for reimbursable activities carried out by this account:
FY 2002 - $4,006,372 FY 2003 - $5,347,000 FY 2004 - $5,354,000
Excludes $4,712 in FY 2002 and $4,038 in FY 2003 for royalties.

Justification

National Library of Medicine

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

Budget Authority: (dollars in thousands)

FY 2002 Actual		FY 2003 Estimate		FY 2004 Estimate		Increase or Decrease	
FTE	BA	FTE	BA	FTE	BA	FTE	BA
673	$274,284	677	$305,927	666	$316,040	-11	$10,113

This document provides justification for the FY 2004 research activities of the National Library of Medicine, including HIV/AIDS activities. A more detailed description of NIH-wide fiscal year 2004 HIV/AIDS activities can be found in the NIH section entitled "Office of AIDS Research (OAR)."

INTRODUCTION

This document describes a vibrant institution with a rapidly expanding role—the National Library of Medicine (NLM). Its role is expanding in the scope of information handled, from books and articles, through multimedia, to source databases such as GenBank, and expanding in customers served, from caregivers and scientists to patients and the international community. In short, advances in medical practice, new horizons in medical research, and the heightened expectation of the public, each contribute to an explosion in the information to be managed and in the demand for access—and everyone turns to the National Library of Medicine, with its 167-years of experience, to get the job done.

The past five years have had a transforming impact on the Library. Perhaps the most dramatic change is in the expanded user community we serve. This community includes not only traditional audiences—health professionals, scientists, educators, students, and librarians—but now, also, we serve directly the general public. With the trend toward virtual ubiquity in electronic information access, today, literally *anyone* with access to the Internet may use NLM's information services, both those directed to the scientific community and those new services directed to the general public.

Among those services for the scientific community is PubMed/MEDLINE. Although the MEDLINE database of journal article references dates back over 30 years, the improvements introduced in the last five years via the PubMed access system have resulted in remarkable increases in usage. The current rate is 500 million searches per year. NLM also provides an extensive set of genetic information resources, including the immense GenBank. The staff of highly trained scientists that create and maintain these resources has more than doubled in the

last five years. For the general public, NLM works closely with other National Institutes of Health (NIH) components to produce MEDLINEplus, the consumer health information service introduced in 1998. This has been expanding rapidly both in usage and in the information it makes available to the public.

In recent years NLM has developed a number of information resources. One example is ClinicalTrials.gov, the result of extensive collaboration among the NLM, the NIH Institutes, the Food and Drug Administration (FDA) , and the research community at large. Other unique services are based on the Library's extensive historical collections, both textual and graphic. A case in point is the digitizing of rare illustrated volumes and making them "browsable" through a unique touch-screen system. Another is the digitizing of the papers—correspondence, lab notes, photos, etc.—of famous American medical scientists and making them available on the Web. NLM has also embarked on an ambitious program to preserve documents in digital form, and we work closely with the Library of Congress, the National Archives, and others to develop a strategy for selecting, organizing, and ensuring permanent access to digital information. These and other examples of notable progress achieved with the increased funding of recent years are described in the following sections.

STORIES OF DISCOVERY

For Scientists and Health Professionals

MEDLINE/PubMed

It has often been observed that medical research begins and ends in a medical library. That is still true today—if one extends the definition of a medical library to the literature-based online databases that scientists use. A thorough review of what has been published is the first step in the research process, and this can be done at any computer terminal with free Web access to MEDLINE. MEDLINE, the world's largest medical literature database, was created and is maintained by the National Library of Medicine. Data resources and data handling tools, such as those produced by NLM's National Center for Biotechnology Information, are essential in actually conducting many of today's experiments. The final step in research is the sharing of findings by entering into MEDLINE pointers to a scientist's published results. No one knows how many blind alleys have been avoided and how much unnecessary and expensive duplication of research averted by scientists having access to up-to-date information about what other researchers around the world have discovered. In a sense, MEDLINE lets today's medical scientists see further by "standing on the shoulders of giants."

The National Library of Medicine has for more than a century provided the biomedical world with the gold standard of scientific information—originally the printed *Index Medicus*®, now also the online MEDLINE database. MEDLINE is a constantly growing electronic file that at last count contained more than 12 million references and abstracts to articles from 4,600 medical journals published worldwide covering the period 1966 to the present. It expands at the rate of about a half million records a year. When MEDLINE first appeared, in 1971, it was truly a pioneering effort in information technology, and it remains today the most authoritative entry point into the biomedical literature.

The sophisticated yet easy-to-use access system for searching MEDLINE on the Web is called PubMed®. Since its introduction in 1997, continual improvements have been made, and today PubMed offers a high degree of flexibility to users. It is by far the most widely used medical information database in the world. Each day the 12 million records are queried more than 1.3 million times by 220,000 unique users. This is roughly a half *billion* searches per year.

Access to Full-text

To make MEDLINE/PubMed even more useful, NLM has introduced links between the references and publisher websites so users could retrieve the full text of articles. Today, more than 3,200 of the 4,500 publications indexed for the database have such links. Where such links are not available, PubMed allows libraries to display information about print holdings available to their institutional users. Users far from a library can use the feature known as "Loansome Doc®" to order an article from a library in the National Network of Libraries of Medicine. A recent improvement is a text version of PubMed for users who require special adaptive equipment to access the web. This has had the additional benefit of making the system much more friendly for those using hand-held devices.

OLDMEDLINE

NLM has extended its databases back in time. "OLDMEDLINE" contains hundreds of thousands of citations to articles from international biomedical journals covering the fields of medicine, preclinical sciences and allied health sciences during the period 1957 through 1965. There is important research published in these articles, on smallpox and tuberculosis to take just two pertinent examples, and to have this information available through online searching is a great boon to today's scientists and public health officials. NLM has also converted to electronic form the mammoth *Index-Catalogue of the Library of the Surgeon General's Office*, the premier resource for the history of medicine in the 19th century.

PubMed Central

A new service to the scientific community is PubMedCentral™. This Web-based digital archive of life sciences journal literature was created by NLM's National Center for Biotechnology Information. Publishers electronically send peer-reviewed articles to be included in PubMedCentral. Articles are usually available online within a day of original publication. A journal may deposit material as soon as it is published, or it may delay release for a specified period of time. NLM guarantees free access to the material; copyright remains with the publisher or the author. There are at present almost 100 journal titles in PubMedCentral, with more soon to come online. NLM has also begun to scan back issues of PubMed Central titles to create an even more useful archive.

NIH Bookshelf

The latest innovation is a service called the "NIH Bookshelf." This is a growing collection of biomedical textbooks that has been assembled in online form in collaboration with the book publishers. There are currently more than a dozen books available, including texts on genetic analysis, molecular biology of the cell, retroviruses, and smallpox. More are scheduled for inclusion in the coming months. A textbook's content can be found by directly searching the Bookshelf, or even from MEDLINE/PubMed abstracts that have been hyperlinked to relevant

book sections. Integrating journal article searching with relevant textbooks is an important step toward creating seamless access to *all* published contemporary biomedical knowledge.

For the Public

MEDLINEplus

The National Library of Medicine has successfully remade itself into an organization that serves not only researchers and the health professions, but now also the general public. The primary impetus for this change is that, when MEDLINE was made freely available on the Web (in 1997) what had been a scientific information resource used almost exclusively by medical librarians, scientists, and health professionals was discovered by consumers. NLM found that 30 percent of all MEDLINE searching was being done by the public. In an effort to arm the public with more useful information, the NLM, in 1998, introduced MEDLINEplus, a source of authoritative, full-text health information from the NIH institutes and a variety of non-Federal sources.

The NLM has been aggressive in casting a wide net to create and promote MEDLINEplus. We work closely with the Public Library Association and other organizations in the broader public service arena, as well as with the 4,700 member institutions of the National Network of Libraries of Medicine®. They and NLM's librarians select sources of the information that are dependable and have an advisory board whose names are listed. They assure that the site is consistently available and its links reliably maintained. Network librarians not only assist in identifying and evaluating information to be included in MEDLINEplus, but are of tremendous help in demonstrating MEDLINEplus locally and publicizing it.

The Library has also learned that many health professionals are finding MEDLINEplus to be an excellent source of information. They 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 receives a constant stream of testimonials from both the public and health professionals about how useful—clear and comprehensive—the system is.

The main features of MEDLINEplus: almost 600 "health topics," from Abdominal Pain to Yeast Infections, detailed and consumer-friendly information about 9,000 brand name and generic and over-the counter drugs, an illustrated medical encyclopedia and medical dictionaries, directories of hospitals and health professionals, a daily health news feed from the major print media, and 150 interactive and simply presented tutorials (with audio and video) about diseases and medical procedures. With one click in MEDLINEplus, one can even do a search of the MEDLINE database to retrieve references and abstracts (and in some cases, full text) of biomedical journal articles. This convenient feature has been specially arranged to return articles that are likely to be useful to the general public (as opposed to highly technical articles).

Like MEDLINE, MEDLINEplus is a constantly evolving system. Links are checked daily and new health topics added weekly. In the days following September 11, entries on anthrax, smallpox, and other bioterrorism-related subjects were quickly compiled and for a while were even more heavily accessed than cancer information. The latest improvement is MEDLINEplus en Español, introduced in September 2002. It provides hundreds of links to health information

in Spanish and is being constantly expanded. As noted in the Introduction, this improvement was made possible with increased funding made available to the NIH. The next major improvement in MEDLINEplus will be to link users to local resources—city, county, state, and regional agencies and support groups. In this regard, a successful prototype of a statewide system has been developed in North Carolina.

The most recent usage figures for MEDLINEplus attest to its growing popularity among the public and health professionals. In October 2002 there were 1.5 million unique visitors who viewed 13 million MEDLINEplus pages. Although these statistics are impressive, the Library is collaborating with the American College of Physicians to promote the use of MEDLINEplus in the medical care setting. Physicians will "prescribe" to their patients a MEDLINEplus topic appropriate for the disease or condition involved.

NIHSeniorHealth.gov

The NLM has been working with the National Institute on Aging to create NIHSeniorHealth.gov. Accessible from MEDLINEplus, the new site contains information in a format that is especially usable by senior citizens. At present NIHSeniorHealth.gov contains information on topics like Alzheimer's and exercise for older adults, but it will soon be expanded to include more topics of special interest to seniors as other NIH institutes contribute to it. NLM is working on adapting special software that would allow the visually impaired to exercise control and hear Web pages read to them. This would also be a boon to some senior citizens.

ClinicalTrials.gov

The MEDLINEplus health topics have links to a database of ongoing and planned scientific studies—ClinicalTrials.gov. Developed by NLM for the National Institutes of Health, this database is a registry of some 6,600 protocol records sponsored by NIH and other Federal agencies, the pharmaceutical industry, and nonprofit organizations in over 70,000 locations, mostly in the United States and Canada, but also in some 70 other countries. 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. The site hosts over 8,000 visitors daily. NLM has worked with the Food and Drug Administration in crafting FDA's "Guidance for Industry: Information Program on Clinical Trials for Serious or Life-Threatening Diseases and Conditions." Within six months following its release, ClinicalTrials.gov received over 400 protocols from pharmaceutical industry sponsors.

Reaching Special Populations

The National Network of Libraries of Medicine (NN\LM®) is of inestimable help to the NLM in our efforts to reach underserved populations. The NN\LM consists of 8 Regional Medical Libraries, 150 resource libraries (at medical schools and other major institutions), and 4,500 libraries at hospitals, clinics, and local health institutions. 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. The NN\LM 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. One of the NN\LM outreach efforts involves a telemedicine "connections" program for Native Americans in the Pacific Northwest conducted through the Regional Medical Library at the University of Washington. This is described in the *Telemedicine* section below, under Medical Informatics.

Another highly successful NLM outreach program has been strengthening Historically Black Colleges and Universities so that they can train people to use information resources in dealing with environmental and chemical hazards. Under this program, faculty and students in more than 80 minority institutions have received such training. NLM is using these schools as conduits to work with underserved communities in promoting high-quality Internet connectivity and the use of technology for research and education.

There are other NLM programs targeting groups of citizens with special health information needs. In the past several years, the Library has made more than 50 awards to continue its HIV/AIDS- related outreach efforts to community-based organizations, patient advocacy groups, faithbased organizations, departments of health, and libraries. This program supports local programs for improving information access for AIDS patients and the affected community as well as their caregivers. Emphasis is on providing information or access in a way meaningful to the target community, and may include training in information retrieval, sending interlibrary loans, and providing Internet access.

NLM's efforts to reach special populations in need are not limited to the United States. An international partnership in which the NLM is a key player is the Multilateral Initiative on Malaria. 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 13 installations in Ghana, Kenya, Tanzania, Uganda, and Cameroon. Pending completion of connectivity are stations in Burkina Faso, Gambia, Nigeria, Zambia, 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 R & D 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. The Library has two R & D components: the National Center for Biotechnology Information and the Lister Hill National Center for Biomedical Communications.

Molecular Biology—"Bioinformatics"

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. Continued progress in our understanding of the relation between genes and disease requires that our information-handling capabilities keep pace with the voluminous data being generated by scientists. The assembled and annotated human genome sequence is allowing researchers to identify diseases genes, decipher biological mechanisms underlying disease, and design and develop therapeutic strategies for treating and preventing disease.

The National Center for Biotechnology Information (NCBI), a component of the NLM, designs and develops databases to store genomic sequence information and creates automated systems for managing and analyzing knowledge about molecular biology and genetics. 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 the comprehensive analysis of the human genome and is thus a key component of the NIH Human Genome Project.

In 2002 the NCBI introduced a new, clearly written "About NCBI" section to its home page. This is noteworthy because, at a level that can be understood by a lay person, the site introduces researchers, educators, students, and the public to the Center's role in organizing, analyzing, and disseminating information in the rapidly growing fields of molecular biology and genetics. One popular section is "A Science Primer," which introduces genome mapping, molecular modeling, and other topics. Another is the "Model Organism Guide, which explains key NCBI model organism resources, mammalian and non-mammalian. "Databases and Tools" gives a concise descriptions of all publicly available NCBI resources.

GenBank

The GenBank® database is a publicly available, annotated, collection of all known DNA sequences. The NCBI is responsible for all phases of GenBank production, support, and distribution, including timely and accurate processing of sequence records and biological review of both new sequence entries and updates to existing entries. GenBank is growing rapidly with contributions received from scientists around the world and now contains more than 15 million sequences and more than 14 billion base pairs from over 100,000 species; it is accessed on the web 200,000 times each day by some 50,000 researchers.

Tools for 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. Entrez is NCBI's 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 PubMed, the retrieval system for biomedical literature. NCBI's MapViewer provides graphical displays of features on NCBI's assembly of human genomic sequence data as well as cytogenetic, genetic, physical, and radiation hybrid maps. The public "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.

Two new tools have been developed by NCBI to address the problems of multiple sequences for single genes and sources of current information about specific genes. "LocusLink" organizes information around genes to generate a central hub for accessing gene-specific information for six organisms (including humans). The Reference Sequence project ("RefSeq), accessed through LocusLink, provides a reference sequence, or standard, for each principal class of molecules found in cells. Together, RefSeq and LocusLink provide a non-redundant view of genes and other loci to support research on genes and gene families, variation, gene expression and genome annotation.

A long-sought goal was achieved in 2002 when NLM developed and implemented a system of gene indexing that allows MEDLINE indexers to create annotated links between records in LocusLink and MEDLINE references. Of the more than 500,000 articles indexed in 2002, more than 13,000 have links to LocusLink.

A Promising Application

One example of these resources in action is the genomic sequence data of the *Anopheles gambiae* (mosquito) recently made public by the NCBI. The *Anopheles* mosquito is the primary agent involved in the transmission of malaria, which leads to 200 million cases and more than one million deaths each year. NCBI has recently provided access to the genomic sequence data of *Anopheles* through GenBank. Also, NCBI's MapViewer tool provides a graphical display of the *Anopheles* genome. NCBI's Malaria Genetics and Genomics site provides full and integrated access to a wide variety of resources both within and outside NCBI, including the assembled genomic data of Anopheles, the genomic MapViewer, sequence similarity searches (BLAST), and access to the biomedical literature through MEDLINE/PubMed. NCBI's set of malaria-related genomic resources will contribute to the understanding of the mosquito genome structure and will spur the development of more effective malaria control strategies and improved anti-malarial drugs and vaccines.

Medical Informatics

The Lister Hill National Center for Biomedical Communications is an NLM component that conducts and sponsors R & D in medical informatics which often leads to major enhancements in NLM's operations and services. The steadily improving results of advanced intramural R & D in scanning and optical character recognition techniques have been in routine use to speed the entry of citations to new articles in PubMed/MEDLINE for the past 5 years. For the first time in 2002, automated indexing algorithms were incorporated into NLM's production indexing system to suggest appropriate subject headings to skilled human indexers. These algorithms combine intramural research advances in natural language processing, statistical retrieval and ranking techniques, and expert rules with the knowledge of the meaning and format of medical terminology that is contained in the Unified Medical Language System (UMLS) resources which NLM has developed over the past 15 years.

The Lister Hill Center also sponsors many exciting communications research projects, such as those in telemedicine and the Visible Human Project. 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.

The newest initiative is to develop a "Scalable Information Infrastructure." The purpose is to encourage the development of health-related applications of scalable, network aware, wireless, geographic information systems, and identification technologies in a networked environment. The initiative focuses on situations that require or greatly benefit from the application of these technologies in health care, medical decision-making, public health, large-scale health emergencies, health education, and biomedical, clinical and health services research. Projects must involve the use of testbed networks linking one or more of the following: hospitals, clinics, health practitioners' offices, patients' homes, health professional schools, medical libraries, universities, medical research centers and laboratories, or public health authorities. NLM is now reviewing a number of applications for support and will make awards later this year.

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. Over the past several years the Lister Hill Center has funded a variety of innovative telemedicine projects that demonstrate the application and use of the capabilities of the Next Generation Internet. One of these is a promising telemedicine project in Iowa known as "A Clinic in Every Home." The goal is to apply newly available technology (for example, state-of-the-art diagnostics and symptom algorithms) to improve access to high quality information, assistance, and access to health services for medically underserved children, working families, the elderly, and rural residents. The expectation is that this system will both raise the quality of health care and lower costs.

Another project is the National Digital Mammography Archive that NLM has funded as part of the Next Generation Internet initiative. Under this program, doctors at four university hospitals can retrieve and view digital mammography images online. The hospitals each hope to save up to $1 million a year by not having to depend on film. If this project succeeds, the hope is to spread it to other hospitals throughout the nation. Because the digital images are large files, the total volume of data being transferred would be staggering and would constitute a real challenge for "next generation" data networks.

Over the last several years NLM has sponsored a variety of telemedicine-based health information outreach activities to Native American communities. These efforts are motivated in part by the understanding that American Indian and Alaska Native communities experience significant health disparities. Many Native villages and Indian reservations are in remote locations, presenting additional challenges with regard to Internet access as well as basic health services. NLM's programs have included the original Tribal Connections Phase I, now complete, and subsequent Phases II and III at select tribal sites in the Pacific Northwest and Southwest. The Tribal Connections Program involved helping isolated communities (16 villages

and tribes in Alaska, Washington, Idaho, Montana, and Oregon) to connect to the Internet and thus have access to health information. The range of activities now also includes a pilot tribal internship program, tribal college outreach, and participation in the NIH American Indian Powwow Initiative.

Visible Human Project

The Visible Human Project comprises two enormous (50 gigabytes) data sets, one male and one female, of anatomical MRI, CT, and photographic cryosection images. These data sets are available through a free license agreement to more than 1,700 individuals and institutions in 45 countries where they are being used in a wide range of educational, diagnostic, treatment planning, virtual reality, artistic, mathematical, and industrial applications. Projects run the gamut from teaching anatomy to practicing endoscopic procedures to rehearsing surgery. A Web site version of a head and neck atlas titled "Functional Anatomy of the Visible Human: Version 1.0 The Head and Neck," has been developed with support by the NLM. The atlas is designed in educational modules covering the topics of mastication, deglutition, phonation, facial expression, extraocular motion, and hearing. A number of tools have been developed for using the atlas, including basic anatomic structure identification, a model builder, orthogonal plane browser, and links to the PubMed Web site for automatic key word searches of the literature.

Other tools are being developed to make the Visible Human data sets more usable. For example, the Insight Toolkit, now being tested, makes available a variety of open source image processing algorithms for computing segmentation and registration on a variety of hardware platforms. This work is being conducted by a consortium of university and commercial entities. Building on the earlier AnatLine system, the object-oriented database of Visible Human images indexed for the male thorax region, Lister Hill Center researchers created and put up on the Web "AnatQuest," which allows users to zoom and navigate through the images.

BISTI

NLM extramural programs have an important role in supporting R & D in biocommunications. Exploiting the potential of computers and telecommunication for health care information requires investigators who understand biomedicine as well as fundamental problems of knowledge representation, decision support, and human-computer interface. NLM remains the principal support nationally for research training in the fields of biomedical informatics as applied to clinical medicine and to basic research. NLM provides both institutional and individual training support.

NLM's grant program also is a key supporter of NIH's "Biomedical Information Science and Technology Initiative" (BISTI). One outcome is that the Library has expanded its support from 12 to 18 training programs at universities across the nation to train experts to carry out research in general informatics and in bioinformatics. These programs support more than 150 trainees at pre-doctoral and post-doctoral levels. The NLM has recently augmented each of the training programs with a "BISTI supplement" and has also funded two planning grants that will eventually lead to the development of what are called National Programs of Excellence in Biomedical Computing.

NEW INITIATIVES

Disaster Management

Informatics has a role to play in medical and public health preparedness for disaster management and terrorist attack. Thus, NLM is pursuing a wide range of activities that contribute to preparedness. The Library supports the development of basic research tools, including: genomics research databases for targeted development of drugs, vaccines, and other forms of treatment for such diseases as smallpox, anthrax, plague, Ebola, and cholera; informatics R & D related to terrorism and disaster management; training for health professionals in the use of informatics resources and tools; improving access to and awareness of information resources useful to public health professionals; developing experimental information resources targeted at first responders and others involved in disaster management; and improving the information infrastructure so that data can be transmitted and shared during a crisis.

NLM's Specialized Information Services develops special toxicology and environmental health information resource pages, some of which are disaster preparedness related, such as biological warfare, lingering airborne hazards, and chemical warfare agents. That organization also is working with the Pan American Health Organization to help build and improve the local and national health information infrastructure in Honduras, Nicaragua, and El Salvador. The main objective of this project is to contribute to disaster reduction by improving the ability of these countries to collect, organize, store, and disseminate public health and medical information related to disasters.

In 2002 the NLM announced a program titled "Application of Advanced Network Infrastructure Technology in Health and Disaster Management." The Library seeks proposals that demonstrate the application of scalable, network aware, wireless, and identification technologies to a networked health related environment. The proposals will focus on situations that will require or greatly benefit from the application of these technologies in health care, including large-scale health emergencies. Also in 2002, NLM announced a new grant program, "Informatics for Disaster Management." This program will support informatics research that addresses information management problems relevant to management of disasters. Even before these announcements, NLM supported research project grants related to disaster management. An example is the project at the University of Pittsburgh to detect biological attacks: Real Time Outbreak Detection System (RODS). The mission of RODS is to investigate methods for the real-time detection and assessment of outbreaks of disease using information technology.

For consumers, NLM provides integrated access to health-related information for the general public produced by Federal agencies and other reputable organizations via MEDLINEplus. Topics include: Biological and Chemical Weapons, Anthrax, Botulism, Disasters and Emergency Preparedness, Immunization/ Vaccination, Infectious Diseases (General), Smallpox, Poisoning, Toxicology, and Environmental Health.

In addition, in today's environment it is only prudent that an organization such as the National Library of Medicine take steps to ensure the security of its systems. NLM has established a multi-faceted, multi-layered security program to prevent, detect, and respond to ever more sophisticated threats to its computer systems and information assets. In the event of a terrorist or other disaster event, the Library will ensure that its information services will continue to be

available to public health officials, health care providers, first responders, and others who rely on them. NLM has in place a disaster recovery plan that addresses terrorist threats.

Standard Vocabulary for Electronic Patient Records

It has been conclusively demonstrated that electronic patient records can improve patient safety, lead to better decisions for clinicians and patients, streamline public health surveillance, and facilitate research. One major obstacle to the use of electronic patient records is the absence of agreed-on standards. NLM's Unified Medical Language System (UMLS) project has made progress in overcoming this obstacle by integrating and distributing many clinical vocabularies used in research and health care. However, there are still problems with cost and use restrictions imposed by some copyright owners, gaps in the available vocabularies, and uncertainty about which vocabularies might be adopted in the future by Federal agencies. Over the past several years, working with other government agencies, NLM has initiated efforts to make key clinical vocabularies freely available for U.S. health care and public health applications. Specifically, NLM has been prominent in a multi-agency project to support a standard vocabulary for laboratory tests and another to develop and distribute a standard nomenclature for the drug as prescribed to the patient (including strength, dose, and route of administration). NLM is currently working to obtain or develop a detailed clinical vocabulary covering diseases, symptoms, allergies, organisms, etc. that can be distributed within the UMLS and used freely throughout the U.S. in health care, public health, and research applications.

Internet Access to Digital Libraries

NLM began a new grant program in 2002, "Internet Access to Digital Libraries." The goal of the program is to help libraries, particularly smaller ones and those in rural or urban areas, to take full advantage of the Internet's ability to facilitate informed decision making by health professionals and consumers. These grants will enable organizations to offer their patrons access to health-related information provided by NLM and others, to transfer files and images, and to be in touch by e-mail and videoconferencing with colleagues throughout the world. NLM was pleased that the announcement of the grant resulted in 113 applications of which 52 were considered meritorious enough to fund. The successful applicants had wide geographic diversity, and a gratifying mix of rural and inner city organizations.

Permanent Access and Preservation

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. Because this information increasingly is in digital form, this responsibility is evolving in ways that would have been incomprehensible in the pre-Internet era. Traditionally, maintaining "integrity" meant dealing with disintegrating paper and bindings, microfilming deteriorating materials, and replacing missing issues to complete a series of journals. These responsibilities are still important, but today, preserving the scholarly record of biomedicine also means dealing with electronic information that may or may not have a paper counterpart. Working with the Library of Congress and others we are developing a strategy for selecting, organizing, and ensuring permanent access to digital information. This last charge, especially in an era of rapidly changing technology and formats, is particularly challenging.

Regardless of the format in which the materials are received, ensuring their availability for future generations remains the Library's highest priority.

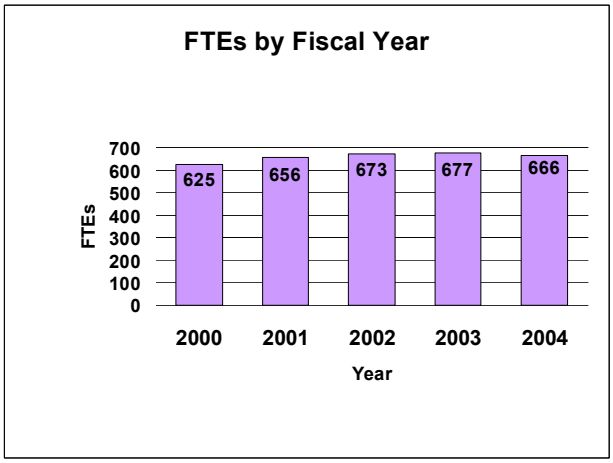
A MEDICAL LIBRARY FOR THE 21ST CENTURY

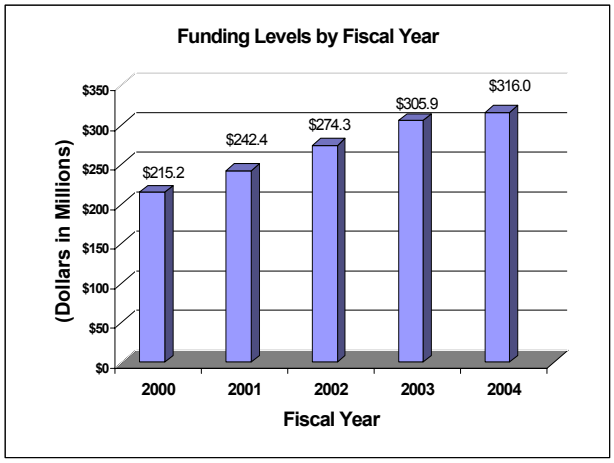
Advances in medical practice, new horizons in medical research, and the heightened expectation of the public, each contribute to an explosion in the information to be managed and in the demand for access—and everyone turns to the Library, with its 167-year experience, to get the job done. The area in which this is most urgent is molecular biology—unarguably the primary driver of medical advances in the 21st century.

In FY 2002, funds were appropriated to design expanded facilities for scientists and sophisticated equipment. In FY 2003, we were asked to report on the features of this new facility, its size, and its expected cost, based on a fast-track schedule. The report will be completed by April 1, 2003.

NLM BUDGET POLICY

The FY 2004 budget request for the NLM is $316,040,000, including AIDS, an increase of $10,113,000 and 3.3% over the FY 2003 amended President's Budget Request. A five year history of FTEs and Funding Levels for NLM are shown in the graphs below. Note that Fiscal Years 2001 and 2000 are not comparable for the NIH Human Resources functional consolidation.

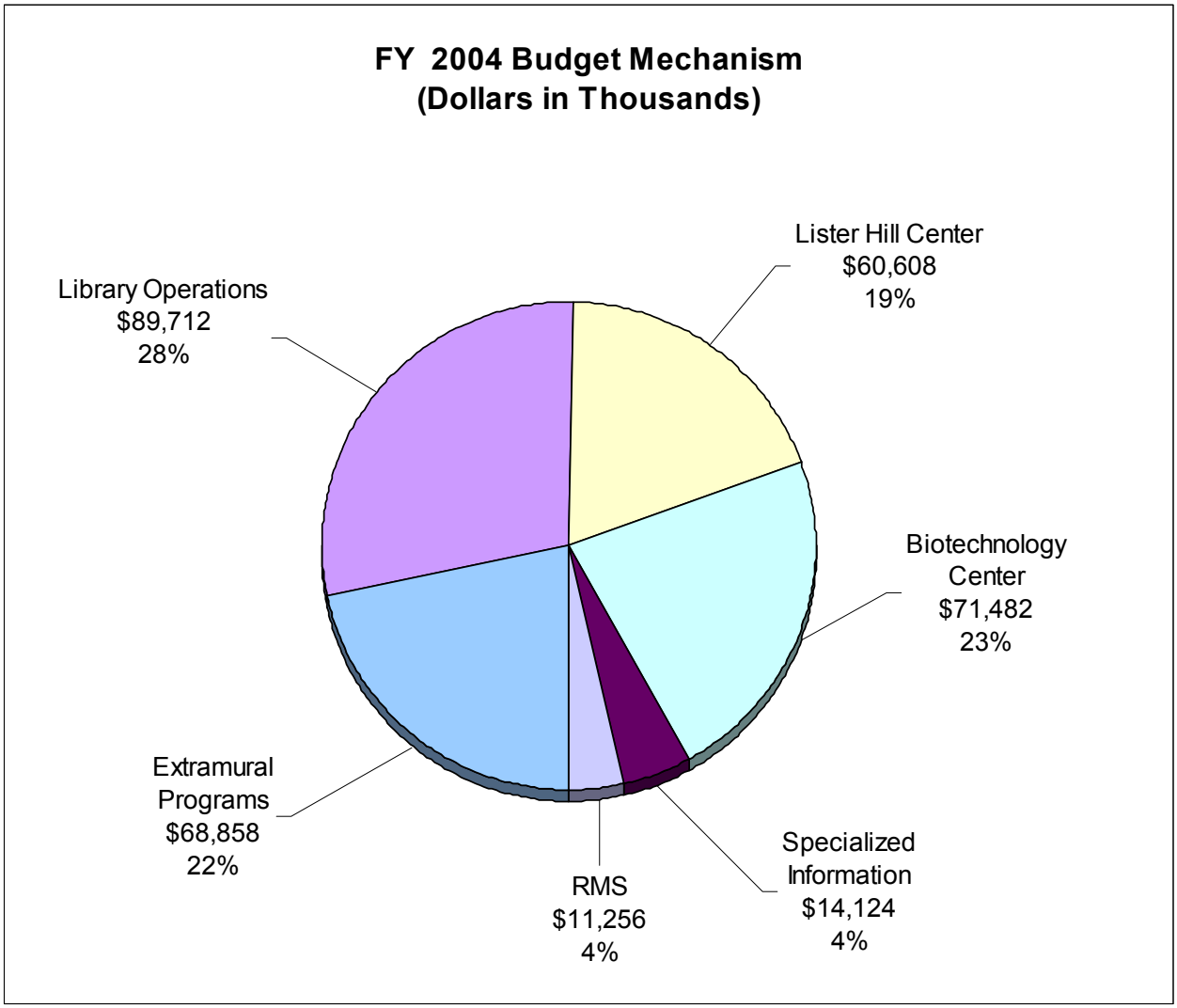




The request continues to support new health care applications; improve consumer health information; utilize advanced computer and communications technologies; emphasize support for library operations including literature acquisition, management, dissemination, and preservation; funds grants in Integrated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

The increase requested is targeted towards special activities which include (1) Informatics Research, (2) Consumer/Minority health, (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, and (4) Prevention.

The FY 2004 budget request for NLM by budget activity is illustrated below:



NATIONAL INSTITUTES OF HEALTH

National Library of Medicine

Budget Mechanism - Total

MECHANISM	FY 2002 Actual		FY 2003 Amended President's Budget		FY 2004 Estimate	
	No.	Amount	No.	Amount	No.	Amount
Grants:						
Noncompeting	88	$20,139,000	109	$29,231,000	90	$24,641,000
Competing	119	26,318,000	88	23,168,000	132	29,678,000
SBIR/STTR	4	600,000	4	660,000	5	726,000
Subtotal, Grants	211	47,057,000	201	53,059,000	227	55,045,000
Contracts:						
Noncompeting	9	13,341,000	9	13,611,000	9	13,813,000
Competing	1	182,000	0	0	0	0
Subtotal, Contracts	10	13,523,000	9	13,611,000	9	13,813,000
Total, Extramural	221	60,580,000	210	66,670,000	236	68,858,000
	FTEs		FTEs		FTEs	
Intramural Programs:						
Library Operations	354	78,484,000	353	88,163,000	349	89,712,000
Lister Hill Center	79	54,884,000	80	58,078,000	78	60,608,000
Biotechnology Center	117	57,939,000	123	67,939,000	121	71,482,000
Specialized Information	31	12,292,000	32	14,043,000	31	14,124,000
Total, Intramural	581	203,599,000	588	228,223,000	579	235,926,000
Research management and support	92	10,105,000	89	11,034,000	87	11,256,000
Total, NLM	673	274,284,000	677	305,927,000	666	316,040,000

NATIONAL INSTITUTES OF HEALTH

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

ACTIVITY	FY 2002 Actual		FY 2003 Estimate		FY 2004 Estimate		Change	
	FTEs	Amount	FTEs	Amount	FTEs	Amount	FTEs	Amount
Extramural Programs:								
Medical Library Assistance		$33,896		$37,862		$39,006		$1,144
PHS 301		26,084		28,148		29,192		1,044
SBIR/STTR		600		660		660		0
Subtotal, Extramural		60,580		66,670		68,858		2,188
Intramural Programs:								
Library Operations	354	78,484	353	88,163	349	89,712	(4)	1,549
Lister Hill Center	79	54,884	80	58,078	78	60,608	(2)	2,530
Biotechnology Center	117	57,939	123	67,939	121	71,482	(2)	3,543
Specialized Information	31	12,292	32	14,043	31	14,124	(1)	81
Subtotal, Intramural	581	203,599	588	228,223	579	235,926	(9)	7,703
Research managament and support	92	10,105	89	11,034	87	11,256	(2)	222
Total	673	274,284	677	305,927	666	316,040	(11)	10,113

NATIONAL INSTITUTES OF HEALTH
National Library of Medicine

Summary of Changes

2003 Amended President's Budget				$305,927,000
2004 Estimated Budget Authority				316,040,000
Net change				10,113,000
	2003 Amended President's Budget Base		Change from Base	
CHANGES	FTEs	Budget Authority	FTEs	Budget Authority
A. Built-in:				
1. Intramural research:				
a. Within grade increase		$52,511,000		$945,000
b. Annualization of January 2003 pay increase		52,511,000		415,000
c. January 2004 pay increase		52,511,000		812,000
d. One extra day of pay		52,511,000		206,000
e. Payment for centrally furnished services		7,641,000		153,000
f. Increased cost of laboratory supplies, materials, and other expenses		168,071,000		3,042,000
Subtotal				5,573,000
2. Research Management and Support:				
a. Within grade increase		7,322,000		132,000
b. Annualization of January 2003 pay increase		7,322,000		58,000
c. January 2004 pay increase		7,322,000		113,000
d. One extra day of pay		7,322,000		28,000
e. Payment for centrally furnished services		468,000		9,000
f. Increased cost of laboratory supplies, materials, and other expenses		4,873,000		103,000
Subtotal				443,000
Subtotal, Built-in				6,016,000

NATIONAL INSTITUTES OF HEALTH
National Library of Medicine

Summary of Changes--continued

CHANGES	2003 Amended President's Budget Base No.	2003 Amended President's Budget Base Amount	Change from Base No.	Change from Base Amount
B. Program:				
1. Research project grants:				
a. Noncompeting	109	$29,231,000	(18)	($4,590,000)
b. Competing	88	23,168,000	40	6,510,000
c. SBIR/STTR	4	660,000	1	66,000
Total	201	53,059,000	23	1,986,000
2. Research centers	0	0	0	0
3. Other research	0	0	0	0
4. Research training	0	0	0	0
5. Research and development contracts	9	13,611,000	0	202,000
Subtotal, extramural	210	66,670,000	23	2,188,000
	FTEs		FTEs	
6. Intramural research	588	228,223,000	(9)	2,130,000
7. Research management and support	89	11,034,000	(2)	(221,000)
8. Cancer control and prevention	0	0	0	0
9. Construction		0		0
Subtotal, program	677	239,257,000	(11)	1,909,000
Total changes	677		(11)	10,113,000

NATIONAL INSTITUTES OF HEALTH
National Library of Medicine

Budget Authority by Object

	FY 2003 Amended Pres. Budget	FY 2004 Estimate	Increase or Decrease
Total compensable workyears:			
Full-time employment	677	666	(11)
Full-time equivalent of overtime & holiday hours	4	0	(4)
Average ES salary	$140,261	$143,067	$2,805
Average GM/GS grade	10.3	10.3	0.0
Average GM/GS salary	$61,807	$63,044	$1,236
Average salary, grade established by act of July 1, 1944 (42 U.S.C. 207)	$83,478	$85,148	$1,670
Average salary of ungraded positions	96,701	98,635	1,934
OBJECT CLASSES	FY 2003 Amended Pres. Budget	FY 2004 Estimate	Increase or Decrease
Personnel Compensation:			
11.1 Full-Time Permanent	$34,856,000	$34,666,000	($190,000)
11.3 Other than Full-Time Permanent	10,806,000	10,852,000	46,000
11.5 Other Personnel Compensation	1,889,000	1,969,000	80,000
11.7 Military Personnel	319,000	333,000	14,000
11.8 Special Personnel Services Payments	1,187,000	1,237,000	50,000
Total, Personnel Compensation	49,057,000	49,057,000	0
12.1 Personnel Benefits	10,635,000	11,087,000	452,000
12.2 Military Personnel Benefits	141,000	147,000	6,000
13.0 Benefits for Former Personnel	0	0	0
Subtotal, Pay Costs	**59,833,000**	**60,291,000**	**458,000**
21.0 Travel & Transportation of Persons	1,099,000	1,119,000	20,000
22.0 Transportation of Things	202,000	205,000	3,000
23.1 Rental Payments to GSA	5,000	5,000	0
23.2 Rental Payments to Others	17,000	17,000	0
23.3 Communications, Utilities & Miscellaneous Charges	1,460,000	1,486,000	26,000
24.0 Printing & Reproduction	602,000	613,000	11,000
25.1 Consulting Services	40,959,000	41,696,000	737,000
25.2 Other Services	59,989,000	65,190,000	5,201,000
25.3 Purchase of Goods & Services from Government Accounts	39,732,000	40,527,000	795,000
25.4 Operation & Maintenance of Facilities	7,688,000	7,826,000	138,000
25.5 Research & Development Contracts	13,650,000	13,896,000	246,000
25.6 Medical Care	0	0	0
25.7 Operation & Maintenance of Equipment	7,172,000	7,301,000	129,000
25.8 Subsistence & Support of Persons	0	0	0
25.0 Subtotal, Other Contractual Services	**169,190,000**	**176,436,000**	**7,246,000**
26.0 Supplies & Materials	1,976,000	2,012,000	36,000
31.0 Equipment	21,073,000	21,452,000	379,000
32.0 Land and Structures	3,000	3,000	0
33.0 Investments & Loans	0	0	0
41.0 Grants, Subsidies & Contributions	50,462,000	52,396,000	1,934,000
42.0 Insurance Claims & Indemnities	0	0	0
43.0 Interest & Dividends	5,000	5,000	0
44.0 Refunds	0	0	0
Subtotal, Non-Pay Costs	**246,094,000**	**255,749,000**	**9,655,000**
Total Budget Authority by Object	**305,927,000**	**316,040,000**	**10,113,000**

NATIONAL INSTITUTES OF HEALTH
National Library of Medicine

Salaries and Expenses

OBJECT CLASSES	FY 2003 Amended Pres. Budget	FY 2004 Estimate	Increase or Decrease
Personnel Compensation:			
Full-Time Permanent (11.1)	$34,856,000	$34,666,000	($190,000)
Other Than Full-Time Permanent (11.3)	10,806,000	10,852,000	46,000
Other Personnel Compensation (11.5)	1,889,000	1,969,000	80,000
Military Personnel (11.7)	319,000	333,000	14,000
Special Personnel Services Payments (11.8)	1,187,000	1,237,000	50,000
Total Personnel Compensation (11.9)	**49,057,000**	**49,057,000**	**0**
Civilian Personnel Benefits (12.1)	10,635,000	11,087,000	452,000
Military Personnel Benefits (12.2)	141,000	147,000	
Benefits to Former Personnel (13.0)	0	0	0
Subtotal, Pay Costs	**59,833,000**	**60,291,000**	**458,000**
Travel (21.0)	1,099,000	1,119,000	20,000
Transportation of Things (22.0)	202,000	205,000	3,000
Rental Payments to Others (23.2)	17,000	17,000	0
Communications, Utilities and Miscellaneous Charges (23.3)	1,460,000	1,486,000	26,000
Printing and Reproduction (24.0)	602,000	613,000	11,000
Other Contractual Services:			
Advisory and Assistance Services (25.1)	40,959,000	41,696,000	737,000
Other Services (25.2)	59,989,000	65,190,000	5,201,000
Purchases from Govt. Accounts (25.3)	28,070,000	28,654,000	584,000
Operation & Maintenance of Facilities (25.4)	7,688,000	7,826,000	138,000
Operation & Maintenance of Equipment (25.7)	7,172,000	7,301,000	129,000
Subsistence & Support of Persons (25.8)	0	0	0
Subtotal Other Contractual Services	**143,878,000**	**150,667,000**	**6,789,000**
Supplies and Materials (26.0)	1,976,000	2,012,000	36,000
Subtotal, Non-Pay Costs	149,234,000	156,119,000	6,885,000
Total, Administrative Costs	**209,067,000**	**216,410,000**	**7,343,000**

NATIONAL INSTITUTES OF HEALTH

National Library of Medicine

SIGNIFICANT ITEMS IN SENATE APPROPRIATIONS COMMITTEE REPORT

The following section represents FY 2003 Congressional requirements for reports and significant items derived from Senate Report 107-216. These actions discussed below are contingent on inclusion of similar language and funding in the final FY 2003 appropriation and related reports. Additional items may be transmitted at a later date as a result of the final Conference report.

Item

Internet connection grant program – The Committee continues to be concerned about limitations on access to health information in rural and other medically underserved areas. It supports the NLM's efforts to address this issue through the Library's Internet Connection Grant program, which partners with regional libraries to provide hardware, set-up, training and access to the Internet at locations in medically underserved areas (p. 147).

Action taken or to be taken

NLM continues to give a high priority to improving access to health care information to rural and other medically-underserved areas. To improve usefulness and penetration of our programs, the NLM Internet Connection program was revised in FY 2002 and renamed Internet Access To Digital Libraries. New elements for hardware, software, and training were described. In addition, a new set of simplified instructions for completing the application were made available, and a major effort was made to publicize the program. As a result, over fifty awards involving almost 400 sites were made. Most states and a large number of rural and inner city locations were included, as well as several faith-based organizations. The program will be continued in FY 2003, and expanded in FY 2004.

Item

Minority health professions – The Committee encourages the NLM to strengthen information technology infrastructure at minority health professions schools that focus their research activities on health disparities and the education of health professionals who serve in medically underserved communities (p. 147).

Action taken or to be taken

NLM is directing many of its outreach efforts toward remedying the disparity in health opportunities experienced by important segments of the American population. These efforts are based on the belief that improving access to free and easy-to-use health-related information (in the form of published literature, databases, and the authoritative content of others) can help solve health disparities. Strengthening information technology infrastructure at minority health professional schools is an integral part of this effort.

Many health-related organizations, particularly smaller ones and those in rural and/or urban health-under-served areas, lack resources to take full advantage of the Internet's ability to facilitate informed decision making by health professionals and consumers.

1) NLM offers Internet Access to Digital Libraries (IADL) grants and Information System Grants to health-related institutions that wish to provide the professionals and clients of their organization with access to high-quality health information via the Internet. These Resource Grants can be used to support a variety of activities and services including but not limited to the following: purchase and installation of equipment and software for initial or expanded connectivity to the internet, including computers, servers, firewalls and routers; provision of network-based access to databases, published knowledge and other library/information services; and design and delivery of information resources and services tailored to the needs of an audience. In FY 2002, awards in these grant programs were made to Meharry Medical College and the veterinary medical library of Tuskegee University.

2) NLM continues to support the highly successful program to strengthen Historically Black Colleges and Universities so that they can train people to use information resources in dealing with environmental and chemical hazards. Under this program, more than 80 minority institutions have received such training, and it was recently expanded to include a Hispanic serving college and a tribal college. NLM is helping to empower these schools as conduits to work with underserved communities in promoting high-quality Internet connectivity and the use of technology for research and education. At the request of the participating schools NLM is developing a strategic plan to expand the scope of this project to include a focus on health disparities affecting minority populations, particularly those that have a large environmental component such as asthma.

3) NLM is supporting the newly established National Human Genome Research Center at Howard University by offering bioinformatics training to several of the Center's researchers. The NLM's National Center for Biotechnology Information (NCBI) has adapted a training curriculum known as Corebio for the specific needs of the Center with a focus on information resources for the analysis of human genome sequence data. Corebio is a network of bioinformatics experts at NIH that have completed an initial nine-week program of training in the use of NCBI's genome resources. As a result of their Corebio training, the Howard University researchers will become part of an NIH network of bioinformatics specialists that exchange information on current bioinformatics problems and solutions.

4) In collaboration with the Office of Minority Health, OPHS, NLM has established a Regional Training Center for Minority Health Professions Schools with an emphasis on providing training on HIV/AIDS and toxicological information resources and other electronic resources. This center was dedicated in May 1999 as the Spann Center, in honor of Dr. Melvin Spann, former Associate Director for Specialized Information Services, NLM. The training center is now being used by NLM and other groups to provide training in a centralized location.

5) NLM has supported a project undertaken by the Center for Public Service Communications to determine the capabilities and needs of the member institutions of the Minority Health Professional Foundation and to propose an implementation strategy for developing and strengthening telecommunications linkages among these institutions. This offered an excellent

opportunity to bring information resources to underserved populations in the U.S. and allows the HBCUs participating in the Toxicology Outreach Project described above to build telemedicine links to each other as well as to external resources. In January 1999 NLM hosted a Workshop on Developing Curriculum for Internet-Based Teaching, Training, and Research for members of the Association of Minority Health Professions Schools. The goal of this workshop was to suggest specific methods for meeting the needs of the member schools. NLM continues to work with HBCUs to foster knowledge of telehealth technology and implementation issues by faculty and community medical professionals.

6) Outreach to health professionals who serve minority populations to ensure that these individuals have access to the most current medical information, continues to be a high priority for NLM. One of the primary mechanisms NLM uses to reach these populations at the local level is through the 4,500 member libraries of the National Network of Libraries of Medicine (NN/LM). 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. The NN/LM places a special emphasis on outreach to underserved populations in an effort to reduce health disparities. There is a wide range of programs and activities to assist in remedying the disparity in health opportunities experienced by African Americans, Latinos, Native Americans, senior citizens, and rural populations.

Item

Outreach **–** The Committee continues to note the success of the NLM's MEDLINE and MEDLINEplus databases. The Committee encourages NLM to continue its outreach activities aimed at educating health care professionals and the general public about the Library's products and services, in coordination with medical librarians and other health information specialists (p. 147).

Action taken or to be taken

For more than 10 years NLM has provided funding to libraries in the National Network of Libraries of Medicine for outreach projects to educate health professionals about the Library's products and services. This funding for outreach to health professionals continues. In 1998, NLM began working with medical and public librarians and other health information specialists, to reach members of the general public to inform them about MEDLINEplus as a source of current, accurate health information. Since that time, dozens of special projects have been funded throughout the US. Many successful outreach projects are the result of new partnerships between libraries and community organizations.

NLM recognizes the need to support innovative methods for reaching health care professionals and the public and has funded a project with the University of North Carolina Health Sciences Library and the University of North Carolina School of Library and Information Science to link local sources of health services to the health information in MEDLINEplus. For example, a woman in Wilmington who has recently been diagnosed with breast cancer can search MEDLINEplus for information on treatment options, then click on a "Go Local" button to see where support groups meet in her town. NC Health Info went live in December 2002 and will

continue to be developed as a prototype, which could be used by other states or geographic areas to develop their own sites of local resources.

Item

Public mandate - The NLM has legislatively mandated outreach activities to publicize its information services to health professionals and the public. Because the Library has developed an extensive set of authoritative and easily accessible (electronic and print) health information services for the public, the Committee encourages the NLM to continue these efforts and also to target specifically certain underserved parts of the U.S. population, particularly ethic minorities, the elderly, non-English-speaking individuals, and Americans living in rural areas (p. 147).

Action taken or to be taken

Ensuring that health professionals and the public in underserved parts of the population have access to health information has been a goal of NLM's outreach programs for many years. Through its National Network of Libraries of Medicine (NN/LM), the NLM is funding innovative outreach projects which include partnerships between medical and public libraries as well as schools, senior centers, clinics, health centers, faith-based, and other community organizations. These projects especially target U.S. residents who are members of minority groups, senior citizens, live in rural communities, or who do not speak English. Their underserved status often also includes lack of access to computers and the Internet, putting them at further disadvantage. Therefore, NLM and the NN/LM is working with agencies and organizations that serve as points of access in their communities for those who do not have such access at home or work.

NLM also recognizes the need to develop products and services, which will provide the information in a format, language or reading level that is most appropriate for the individual. In 2002, NLM made available a new senior-friendly web site, developed with the National Institute on Aging, which serves as an entry point into MEDLINEplus. NIHSeniorHealth.gov is designed to provide health information in a format that is compatible with the cognitive, visual, and perceptual changes that occur with age. To encourage other NIH Institutes to add senior-friendly content to this web site, NLM has developed a template for their use. Soon, pages on breast, prostate, colon, and lung cancer developed by the National Cancer Institute will be added. NLM will work with other Institutes to expand the topics covered by NIHSeniorHealth.gov.

In September 2002, NLM announced the availability of a Spanish language version of MEDLINEplus to help meet the health information needs of Spanish speaking citizens and their families. The Spanish version mirrors the English language content of the web site, where a Spanish translation is available. Presently, there is information on 490 health topics. In the first month there were 38,000 unique visitors viewing almost 408,000 pages.

Item

Senior citizen outreach - The Committee continues to support the NLM's efforts to provide senior citizens with expanded access to NLM's databases, through such means as including Internet access at senior centers and congregate meal sites (p. 148).

Action taken or to be taken

The NLM remains committed to making health information on the Internet easily available to all citizens – especially older Americans. NLM's interest in reaching older Americans is two-fold: 1) more and more older people are using the Internet as a source of health information, and 2) Americans over the age of 65 are twice as likely to be hospitalized and incur over 50 percent of health care costs. Clearly, seniors can benefit tremendously from increased access to good, reliable, up-to-date health information from the National Institutes of Health. To better meet the growing information needs of seniors, the National Library of Medicine and the National Institute on Aging (NIA) have developed NIHSeniorHealth.gov – a new website that is compatible with the cognitive, visual and perceptual changes that occur with age. This new site was beta-tested in 2002. The NLM and the NIA are now working with other NIH Institutes to assist them in the transfer vital health information into this new senior-friendly format in preparation for a national launch later in 2003.

In addition to developing a senior-friendly website, the NLM also remains dedicated to increasing the access seniors have to good health information. Therefore, NLM is partnering with the American College of Physicians and the American Society of Internal Medicine (ACP/ASIM) to launch a pilot project to sensitize patients about the availability of MEDLINEplus – NLM's free, comprehensive, authoritative health information website. Beginning in the spring of 2003, ACP/ASIM members in Georgia and Iowa will begin writing "Information Prescriptions" directing their patients to MEDLINEplus as a source of health information on the Internet. Research shows that the public is eager to obtain good sources of health information on the web and are more likely to trust a website that has been recommended by their physician.

NATIONAL INSTITUTES OF HEALTH
National Library of Medicine

Authorizing Legislation

	PHS Act/ Other Citation	U.S. Code Citation	2003 Amount Authorized	2003 Amended President's Budget	2004 Amount Authorized	2004 Budget Estimate
Research and Investigation	Section 301	42§241	Indefinite	$305,927,000	Indefinite	$316,040,000
National Library of Medicine	Section 41B	42§285b	Indefinite		Indefinite	
National Research Service Awards	Section 487(d)	42§288	a/	0	b/	0
Total, Budget Authority				305,927,000		0

a/ Amounts authorized by Section 301 and Title IV of the Public Health Act.
b/ Reauthorizing legislation will be submitted.

NATIONAL INSTITUTES OF HEALTH
National Library of Medicine

Appropriations History

Fiscal Year	Budget Estimate to Congress	House Allowance	Senate Allowance	Appropriation 1/
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	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				(1,567,000)
2003	307,556,000			
2004	316,040,000			

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 2002 Actual	FY 2003 Amended Pres. Budget	FY 2004 Estimate
Division of Library Operations	354	353	349
Lister Hill Nat'l. Ctr. For Biomedical Co	79	80	78
National Center for Biotechnology Info.	117	123	121
Div. of Specialized Information Service	31	32	31
Office of the Director	28	28	28
Office of Administration and Management	46	43	41
Division of Extramural Programs	18	18	18
Total	673	677	666
FTEs supported by funds from Cooperative Research and Development Agreements	(0)	(0)	(0)

FISCAL YEAR	Average GM/GS Grade
2000	10.3
2001	10.2
2002	10.2
2003	10.3
2004	10.3

NATIONAL INSTITUTES OF HEALTH
National Library of Medicine

Detail of Positions

GRADE	FY 2002 Actual	FY 2003 Amended Pres. Budget	FY 2004 Estimate
ES-6	0	0	0
ES-5	1	1	1
ES-4	2	2	2
ES-3	1	1	1
ES-2	2	2	2
ES-1	0	0	0
Subtotal	6	6	6
Total - ES Salary	$816,263	$841,567	$858,398
GM/GS-15	26	27	27
GM/GS-14	48	49	49
GM/GS-13	108	104	100
GS-12	145	143	141
GS-11	39	38	37
GS-10	3	3	3
GS-9	26	26	26
GS-8	80	80	80
GS-7	33	25	25
GS-6	11	9	9
GS-5	18	19	19
GS-4	44	42	42
GS-3	11	10	10
GS-2	2	3	3
GS-1	3	3	3
Subtotal	597	581	574
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			
Assistant Grade			
Subtotal	3	3	3
Ungraded	119	123	123
Total permanent positions	542	533	522
Total positions, end of year	725	713	706
Total full-time equivalent (FTE) employment,end of year	673	677	666
Average ES level	ES-3	ES-3	ES-3
Average ES salary	$136,044	$140,261	$143,067
Average GM/GS grade	10.2	10.3	10.3
Average GM/GS salary	$59,949	$61,807	$63,044