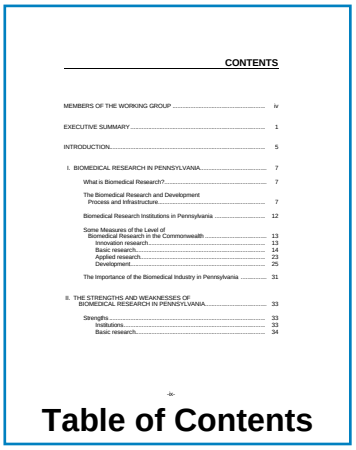
# OPPORTUNITY IN THE AGE OF BIOLOGY

## BIOMEDICAL RESEARCH IN PENNSYLVANIA



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# REPORT OF THE WORKING GROUP ON BIOMEDICAL RESEARCH


General Assembly of the Commonwealth of Pennsylvania

JOINT STATE GOVERNMENT COMMISSION

108 Finance Building

Harrisburg, Pennsylvania 17120

October 2000

The release of this report should not be construed as an indication that the members of the Executive Committee of the Joint State Government Commission endorse all of the report's findings, recommendations or conclusions.

**JOINT STATE GOVERNMENT COMMISSION**
**ROOM 108 FINANCE BUILDING**
**HARRISBURG PA 17120-0018**

**717-787-4397**
**FAX 717-787-7020**

**E-mail: jntst02@legis.state.pa.us**

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The Joint State Government Commission was created by act of July 1, 1937 (P.L.2460, No.459) as amended, as a continuing agency for the development of facts and recommendations on all phases of government for the use of the General Assembly.

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---

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---

# WORKING GROUP ON BIOMEDICAL RESEARCH

Robert S. Aronstam, Ph.D.
Scientific Director
Guthrie Foundation for Medical Research

Alfred A. Bove, M.D., Ph.D.
Associate Dean for Practice Plan Affairs
Temple University Hospital

Clayton Buck, Ph.D.
Deputy Director
Wistar Institute

Eileen Connelly
Secretary-Treasurer
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Thomas Detre, M.D.
Executive Vice President
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UPMC Health System

C. McCollister Evarts, M.D.
University Professor
and Professor of Orthopaedics
Milton S. Hershey Medical Center

Mickey Flynn
President
Puresyn

Cynthia Gawron-Burke, Ph.D.
Director of Technology Transfer
Children's Hospital of Philadelphia

William M. George
President
Pennsylvania AFL-CIO

David P. Greenberg, M.D.
Division of Infectious Diseases
Children's Hospital of Pittsburgh

William N. Kelley, M.D.
University of Pennsylvania Health System

Elliott C. Kulakowski, Ph.D.
Director
Research and Technology Development
Albert Einstein Healthcare Network

Arthur S. Levine, M.D.
Senior Vice Chancellor for the Health Sciences
Dean of the School of Medicine
University of Pittsburgh

Richard V. McCloskey, M.D.
Vice President of Medical Affairs
Chief Medical Officer
Centocor, Inc.

Jay Middleton
State Government Relations Manager
Wyeth-Ayerst Pharmaceuticals

Russ Molloy, J.D.
Associate Executive Vice President
for Government Relations
University of Pennsylvania Health System

Mary Jane Mulcahey-Hershey
Clinical Coordinator of Research
Shriner's Hospital for Children

Erin O'Brien
Manager for Corporate
Sponsored Research
Children's Hospital of Philadelphia

Hope Punnett, Ph.D.
Director of Cytogenetics
St. Christopher's Hospital for Children

E. Premkumar Reddy, Ph.D.
Chairperson
Biochemistry Department
Temple University Medical School
Director, Fels Institute for Cancer
Research and Molecular Biology

Jussi J. Saukkonen, M.D.
Dean, College of Graduate Studies
Vice President for Science Policy,
Technology Development
and International Affairs
Thomas Jefferson University

Carolyn F. Scanlan
President and CEO
The Hospital and Healthsystem
Association of Pennsylvania

David S. Smith, Esq.
Board Member
Pennsylvania Biotechnology Association
General Counsel
TissueInformatics, Inc.

Robert G. Uris
Director of Technology Transfer
Children's Hospital of Philadelphia

Floyd W. Warner
President
Pennsylvania Chamber of Business and Industry

Victor W. Weedn, M.D., J.D.
Principal Research Scientist
Center for Light Microscope
Imaging and Biotechnology
Carnegie Mellon University

Vincent R. Zurawski, Jr., Ph.D.
Adjunct Associate Professor
Department of Pathology and
Laboratory Medicine
School of Medicine
University of Pennsylvania

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GENERAL ASSEMBLY OF THE COMMONWEALTH OF PENNSYLVANIA
JOINT STATE GOVERNMENT COMMISSION
ROOM 108 - FINANCE BUILDING
HARRISBURG 17120

717-787-4397
FAX 717-787-7020

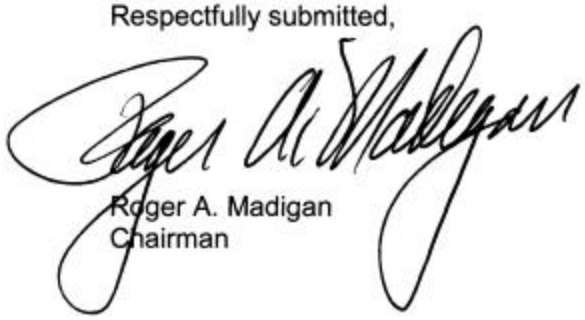
October 2000

TO THE MEMBERS OF THE GENERAL ASSEMBLY:

The Joint State Government Commission is pleased to present the report of the Working Group on Biomedical Research. The working group was created under 1998 House Resolution No. 419 sponsored by Representative Dennis M. O'Brien.

This report reflects the collective dedication, expertise and wisdom of the members of the working group who so generously shared their time. It represents over a year of rigorous study. On behalf of the General Assembly, I commend Representative O'Brien and the members of the working group for their accomplishment.

Respectfully submitted,



Roger A. Madigan
Chairman

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# EXECUTIVE SUMMARY

***What is biomedical research?***

Biomedical research is research undertaken to gain the knowledge and understanding of the biological processes and the causes of disease, with the goals of disease prevention, reduced suffering and the prolonged and improved quality of life. The research and development (R&D) process involves a complex mosaic of process stages, scientific procedures, performing institutions, testing institutions, and funding sources. The process requires a substantial number of years for movement from ideas to products.

***The times for biomedical research are unique***

In a relatively few years, advances in biomedical research have changed our understanding of the life sciences, opening the door to new ways to prevent, treat and cure disease. New drugs and therapies have been extremely successful in treating AIDS, heart attacks and strokes, cancer and many other diseases. But the best may be yet to come. The deciphering of the human genome has been called "an achievement that represents a pinnacle of human knowledge." Advances in this exciting field are likely to produce a profound acceleration in biomedical research in the coming years, leading to untold benefits in the human condition. This era will be the Age of Biology. Biotechnology and informatics will likely be the two growth industries in this new age.

***Future opportunities in Pennsylvania in this field are enormous***

Opportunities for Pennsylvania in this new age are vast. The Commonwealth's medical centers, hospitals, colleges and universities, research institutions, and biotechnology and pharmaceutical companies that perform biomedical research are among the best in the world. Pennsylvania has some of the finest people working in biomedicine. The Commonwealth is poised to be a leader in biomedical science in the coming years.

***But the challenges are also substantial***

Pennsylvania cannot rest on its laurels. The future cannot be based on "business as usual." Strong competition from other states has already begun

and will intensify. Pennsylvania must evaluate its strengths and weaknesses in biomedical research and build on the strengths and repair the weaknesses.

### *What this report is all about*

House Resolution No. 419 of 1998, created a working group to investigate the level of academic biomedical research in Pennsylvania and recommend actions to insure its growth. This report is the working group's response to the resolution. The report describes the status of biomedical research--academic biomedical research and related biomedical research institutions--in the Commonwealth and analyzes its strengths and weaknesses. The description and analysis are the prelude to an enumeration of the strategic policies and priorities that are required for biomedical science in Pennsylvania to grow and prosper in this exciting environment.

### *Biomedical research expenditures in Pennsylvania are very large*

The total level of biomedical research in the Commonwealth is difficult to measure with precision. Dollars spent by academic and other research institutions for the first stage of the research process--innovation research--are not available. The remaining research stages--basic research, applied research and development--are best measured using expenditure data compiled by the National Science Foundation (NSF), and research awards made by the National Institutes of Health (NIH). In 1998, expenditures for research and development by Pennsylvania academic institutions are estimated to have totaled $1.3 billion. Expenditures on basic research alone were $893.3 million. NIH awards, the largest source of funds for basic biomedical research, totaled $735.2 million. Awards were made by a large number of NIH institutes to a wide variety of Commonwealth academic and other research institutions. The largest academic recipients were the University of Pennsylvania, the University of Pittsburgh, the Pennsylvania State University and Thomas Jefferson University. Over the years 1989 to 1998, Commonwealth institutions received $5.5 billion in awards from the NIH. During this interval, NIH awards in Pennsylvania grew by over 10 percent, *the second highest growth rate among comparable states*. In 1998, expenditures for applied research by Commonwealth academic institutions totaled $332 million and expenditures for development $108 million. Pennsylvania and its local governments, industry, the institutions themselves and private foundations supplemented federal funding for research and development expenditures at all stages. For every dollar of external funding received for research, the institutions must add about 18 cents of their own money. Significantly, during 1998, funding by Pennsylvania and its local governments accounted for only 5 percent of the federal funding for the academic R&D expenditures performed in the Commonwealth, *the second lowest ratio among comparable states*.

### *And biomedical research is very important in Pennsylvania's economy*

Direct spending by academic institutions on biomedical research has a multiplier effect of 2.3 on induced spending by other sectors of Pennsylvania's economy. Therefore, the economic impact of the $1.3 billion in total R&D expenditures by Pennsylvania's academic institutions in 1998 was about $3.1 billion. Private sector companies are also an important part of the picture. In 1998, nearly 900 private biomedical establishments in the Commonwealth employed over 41,000 persons with an annual payroll of $1.8 billion. The total value of their biomedical shipments was $15 billion. Biomedical research stands behind a very large health care industry in Pennsylvania. In 1998, over 31,000 health care establishments employed over 740,000 persons with an annual payroll of $21 billion. In 1998, the health services industry accounted for about 7.4 percent of Pennsylvania's gross state product. Government research investments have been estimated to provide a total rate of return on investment of 28 percent.

### *Biomedical research in Pennsylvania has great strengths*

By almost all measures, biomedical research in Pennsylvania is strong and vibrant. The Commonwealth's institutions are among the best in the world. These institutions are able to attract substantial funding for basic research projects from the NIH and other federal agencies, as well as some of the best researchers at all stages of biomedical research.

### *But it also has major systemic weaknesses*

Major systemic weaknesses exist in the biomedical research process in the Commonwealth as well. The erosion of infrastructure in the academic medical centers and other biomedical research institutions--declines in institutional revenues available for research, in physician-scientists, and in the condition of research buildings, laboratories, equipment, etc--is the most critical area of need for biomedical research in Pennsylvania. Insufficient funding for the transfer of basic research ideas from research institutions to private sector companies for product development is the second most important need in the Commonwealth. The lack of regional institutions, designed to promote and coordinate biomedical research efforts and develop research specialties that are strong enough to compete with major programs in other states, is a third major weakness. Another weakness involves the lack of a solution to the problem of the high debt load of students graduating from the Commonwealth's medical schools.

***To correct these weaknesses, the working group recommends that these strategic policy actions be considered***

- To build and maintain the biomedical infrastructure in Pennsylvania's academic and other biomedical research institutions, a Commonwealth Biomedical Research Infrastructure Fund should be established and distributed to the institutions on the basis of their actual NIH funding. These monies should not go to individual researchers; most meritorious projects are already sufficiently funded.

- To aid in the transfer of basic research ideas from research institutions to private biotechnology companies in Pennsylvania for product development, a Commonwealth Biomedical Research Venture Capital Fund should be established. A program of Commonwealth and local tax incentives might supplement this fund.

- To promote and coordinate regional efforts in biomedical research between academic and other institutions, and to build specialized application areas, a virtual institute or system of regional Biomedical Research Institutes should be established.

- To address the problem of the very high debt load of students graduating from Pennsylvania's medical schools, a Commonwealth Medical Student Debt-Relief Program should be established.

***Why these policy actions are needed now***

Other states have already undertaken initiatives to strengthen biomedical research. Creative programs in these states have produced large, important research centers that provide the critical mass of infrastructure and product development needed for the growth of their biomedical research industries. Pennsylvania needs to act now to meet this competition, or it risks missing out on its unique opportunities. The goal for Pennsylvania should be no less than remaining in the top-tier of biomedical research and expanding the essential role of biomedical research in the economic vitality of the Commonwealth.

# INTRODUCTION

House Resolution No. 419 of 1998, introduced by Representative Dennis M. O'Brien, directs the Joint State Government Commission to establish a working group to investigate and report on the level and nature of academic biomedical research currently conducted in Pennsylvania and to compare biomedical research in Pennsylvania to other states. In addition, the resolution directs the working group to recommend ways for the Commonwealth to encourage the growth of biomedical research in Pennsylvania and to recommend specific measures for increasing Pennsylvania's share of federal and private funding for biomedical research to enhance the Commonwealth's health care system and contribute to the Commonwealth's economy.

This report is the response of the Working Group on Biomedical Research to the General Assembly. While the report represents the consensus of the members of the working group, it does not necessarily reflect unanimity on all points. Section I provides a definition of biomedical research, a model of the biomedical research and development process and infrastructure, a roster of the academic and other biomedical research institutions in Pennsylvania, measures of the scale of several key stages of biomedical R&D in the Commonwealth, and measures of the importance of the biomedical industry to Pennsylvania's economy. Where possible these measures for Pennsylvania are compared to several similar states. Section II discusses the strengths and weaknesses of the biomedical R&D industry in Pennsylvania. The latter focuses especially on the factors that have led to the erosion of infrastructure in Pennsylvania's research institutions and slow or inadequate technology transfers from the research institutions to private biotechnology and pharmaceutical companies. Section III presents the working group's recommendations for Commonwealth policies that strategically target the weaknesses of biomedical research in Pennsylvania: an infrastructure fund that would help leverage external research funds by assisting institutions in maintaining and building their research infrastructures; a venture capital fund to assist in the transfer of technology from research institutions to private sector companies for product development, thereby reducing the disconnect between biomedical ideas and products; virtual or regional biomedical research institutes to administer programs to promote and coordinate biomedical R&D and build regional research specializations to help Pennsylvania to compete with other states; and a medical student debt-relief program. These policies are

necessary to produce a healthy and productive citizenry and workforce in Pennsylvania, to enhance biomedical research's effect on the Commonwealth's economy, to maintain and build on an already important sector in Pennsylvania, and to meet the competition to Pennsylvania from other states.

# I. BIOMEDICAL RESEARCH IN PENNSYLVANIA

## WHAT IS BIOMEDICAL RESEARCH?

Biomedical research is research undertaken to gain the knowledge and understanding of basic, biological processes and the causes of disease. This knowledge base is conducted and transformed into beneficial products and procedures by a wide variety of institutions. The biomedical research community comprises medical centers, hospitals, colleges and universities, research institutions, and biotechnology and pharmaceutical companies. Their efforts are directed to disease prevention, reduced suffering, and the prolonged and improved quality of life.[1]

## THE BIOMEDICAL RESEARCH AND DEVELOPMENT PROCESS AND INFRASTRUCTURE

There are three major types of biomedical research: basic or conceptual research, patient-oriented research and disease-oriented research. The three types represent research focuses and organizations within biomedical research, and are all in use in Pennsylvania's academic and other research institutions.

Regardless of type, the biomedical research and development process involves a complex mosaic of process stages, scientific procedures, performing institutions, testing institutions and funding sources. Furthermore, the process from hypothesis formulation through product or procedure marketing can be spread over a variable but considerable period of time.

The earlier phases of the research continuum from idea to commercial product generally involve lesser capital investments but higher risk of failure, while the later phases involve greater capital investments but a lesser risk. Only a few developmental efforts and even fewer basic ideas result in commercial products. It is appropriate that the public sector supports the early high-risk phases, while private industry invests in products that have greater promise and are closer to commercialization.

[1]Connecticut United for Research Excellence, Inc., *Biomedical Research, Biotechnology, and Connecticut Economic Growth* (Rocky Hill, CT, 1996).

Figure 1 (page 9) is a diagram of the biomedical research and development process. Although this diagram presents a model of the R&D process that specifically applies to research on biopharmaceuticals, pharmaceuticals and vaccines, the model represented is fairly general--it describes the process for a wide range of therapeutic and diagnostic medical research, and generally applies to the three types of biomedical research.[2]

In the pilot or *innovation research* stage of this process, a researcher seeks to understand the biology of a disease at both the phenomenological and molecular levels. Most often in a medical center, university or hospital, a researcher begins by forming a hypothesis and gathering suggestive data to support the hypothesis. The more data a researcher can gather in this early stage in support of the hypothesis, the greater are the chances of attracting federal or private funding to continue the research in the next stage. The payback to these first efforts is highly uncertain. Moreover, the initial investment is very high; a new researcher typically requires $750 thousand to $1 million in "seed money" each year extending over several years to develop a new idea to the point where it can attract federal or private funding. This investment is most often funded by the institution in which the innovation research is performed.

In the next or *basic research* stage, a researcher attempts to expand or deepen the "knowledge base," i.e., to expand the understanding of the biological hypothesis and further study the outcomes to experiments that test the hypothesis. This stage of the process is typically conducted at the same institution in which the original innovation research was undertaken. The research conducted at this second stage is also critical, for only successful projects move on to the applied research stage. Basic research is also expensive and can take several years. Research at this stage is usually funded by grants from either the federal government or nonprofit organizations; in large part, basic research is funded by awards by the National Institutes of Health. To obtain funding from either source, however, a researcher must first have produced significant results in the innovation research stage.

Following basic research, the process moves to the *applied research* stage. In this stage, a researcher's hypothesis moves towards a tangible product or process related to the hypothesis. For example, a researcher might propose the synthesis of a new candidate drug to treat a target disease, attempt to improve an existing drug, or purify a biological macromolecule that is hypothesized to be useful in the treatment or prevention of a disease. Newly identified research products or processes may be tested in a laboratory or in an animal model of a human disease. Usually, in the applied research stage, research technology is transferred from an academic or other institution to a private sector pharmaceutical or biotechnology company. This company then

[2]The working group acknowledges member Vincent R. Zurawski, Jr., Ph.D., for providing the diagram and description of the biomedical research and development process model used in this report.

FIGURE 1
RESEARCH & DEVELOPMENT PROCESS
Biopharmaceuticals, Pharmaceuticals and Vaccines

| | RESEARCH | | | DEVELOPMENT | | | | |
|---|---|---|---|---|---|---|---|---|
| **PROCESS STAGES** | **INNOVATION** | **BASIC** | **APPLIED** | **PRE-CLINICAL** | **PHASE I & II CLINICAL TRIALS** | **PHASE III (PIVOTAL) CLINICAL TRIALS** | **STATISTICAL ANALYSIS** | **NDA CREATION**** |
| **SCIENTIFIC PROCEDURES** | Biological hypothesis is formed and data is gathered for support | | | Candidate product is identified and evaluated in laboratory | Specific clinical hypothesis is formed | Specific clinical hypothesis is tested | | |
| **PERFORMING INSTITUTIONS** | Academic medical centers, universities, hospitals and government research labs | | Pharmaceutical and biotechnology companies | | | Pharmaceutical companies and hospitals | | |
| **TESTING INSTITUTIONS** | | | Contract testing companies | | Academic medical centers and hospitals | | | |
| **FUNDING SOURCES*** | Academic institutional investment | Federal government grants, industrial investments, and private grants | Pharmaceutical and biotechnology company investment | | | Pharmaceutical company investment | | |
| **TIMELINE** | 2 - 10 Years | | | 5 - 10 Years | | | | |

*Academic institutional funding is required for all R&D process stages.
**NDA is New Drug Application.

SOURCE: Vincent R. Zurawski, Jr., Director of Research Business Development, University of Pennsylvania Health System, University of Pennsylvania School of Medicine, Philadelphia, PA, November 1999.

takes over the performance and funding of the project. The originating institution receives a license fee for the transfer of the property right to the hypothesis.[3] *The lines between basic research and applied research are often blurred, however. Sometimes the latter stage of basic research is performed by the academic institution, at other times by the pharmaceutical or biotechnology company*. Testing at this stage is often performed by a contract testing company.

The innovation, basic and applied research stages are usually multi-year undertakings. Together, these stages often last from two to ten years or more.

At this point in the process, intermediate product efforts may be undertaken. Intermediate product development includes the development of a manufacturing process for a candidate product that meets all of the rigorous standards of regulatory agencies around the world. Once a candidate product can be manufactured, the reproducibility of the manufacturing process, as well as the purity and potency of the product, must be established. This stage of the process is very costly—product development and the validation of quality control assays can easily exceed $10 million. Toxicology testing can initially add more than $1 million to the cost.

Early on, intermediate product development includes pre-clinical development, followed by the first and second phases of clinical evaluation. These process stages concentrate first on product safety, and then on product efficacy. Phase I and Phase II clinical trials are designed to generate a clinical hypothesis and data related to clinical outcomes. Sometimes Phase I and Phase II trials are combined into Phase I/II trials.

Final product development commences when Phase I and Phase II trial data generate a clinical hypothesis, and when it is confirmed that there is a large enough market for the candidate product. Unless both of these criteria are met, it is not likely that a greater investment in the development of the product will be made.

If further development is warranted, the process moves to the finalization of a large scale manufacturing process and the development of the attendant quality control procedures. At this time, Phase III clinical trials--pivotal clinical trials--will be indicated. These trials are designed to test the clinical or patient-based hypothesis that was generated in the Phase I and Phase II trials. Sometimes, a late Phase II trial will be combined with a Phase III trial to become a Phase II/III trial. Late stage product development always includes a detailed statistical analysis of all of the results from the Phase I through Phase III trials.

[3]In lieu of a license fee, the originating institution can receive an equity position in the company which acquires the property right. The institution can receive dividend income or sell the equity portion for revenue.

If the results of the pivotal trials prove the clinical hypothesis to be correct, the pharmaceutical or biotechnology company will usually file a New Drug Application (NDA) or equivalent with the U.S. Food and Drug Administration (FDA), requesting registration of the candidate product for sale. Generally, proof comes in the form of a pre-determined, statistically significant outcome to the clinical trials, e.g., fewer patient deaths in a candidate product-treated group compared to a placebo-treated control group within a specified time period. A candidate product may be recommended for approval by the FDA following intramural data analysis and applicant presentations to a panel of experts. The FDA makes the final determination to approve or disapprove the NDA. If a candidate product is registered by the FDA, it may be sold only for the particular clinical indications that were identified and approved in the Phase I through Phase III clinical trial process. Often companies will decide to conduct Phase IV clinical trials to gain approval for other indications for a product.[4]

The various parts of intermediate stage product development are typically performed by pharmaceutical or biotechnology companies. Early stage testing is performed by contract testing companies, later testing by academic medical centers and hospitals. The various parts of late stage product development are done by pharmaceutical companies and contracting hospitals. Late stage clinical testing is generally done by academic medical centers and hospitals. Thus, medical schools are critical to the performance of many clinical trials.[5] Funding for the product development process is provided by pharmaceutical and biotechnology companies. The product development process can take a very long time, usually five to ten years or more. It is risky and enormously costly.

The research and development process described above is sometimes called *translational research*. In the process, ideas discovered and documented by academic and other research institutions are translated through the transfer of technologies into commercially viable products and processes by companies in the private sector. Each participant in the process contributes according to its strength. The outcomes are socially beneficial processes and products.

The biomedical research and development process takes place in a setting, or *infrastructure*. The term, infrastructure, is used in the broadest sense: research infrastructure includes the traditional buildings and equipment, but also includes a wide variety of people and funding sources.

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[4]For example, a product which was originally developed to lower cholesterol and prevent heart disease may later be found to also prevent osteoporosis.

[5]As an alternative to medical schools, pharmaceutical companies sometimes turn to private practitioners to conduct clinical trials. Nonmedical center settings are often less expensive because of lower overhead. Also, academic institution infrastructure is sometimes not adequate to do the job. However, uses of private practitioners for clinical trials are an exception. Academic medical centers continue to conduct high quality, rigorous clinical trials that are internally robust. They are crucial to this phase of the biomedical research process.

Physician-scientists, principal investigators, laboratory assistants and administrative and support people perform tasks in the various stages of the academic biomedical R&D process. Senior researchers typically have M.D., Ph.D., or M.D./Ph.D. degrees. Persons with medical degrees perform an extremely important role in translating ideas in laboratories to outcomes in clinics, from bench to bedside.

Academic biomedical research and development is performed by these persons in academic and hospital laboratories and hospital clinics, using complex research equipment. Both buildings and equipment are very costly, and obsolescence can occur quickly.

As shown in Figure 1 (page 9), the various stages of biomedical research and development are funded by a number of major sources. Basic research is externally funded primarily by several departments of the federal government and to a lesser degree by industry and private foundations. Funding usually covers salaries and can provide the specialized equipment, which is required for a project. Federal and foundation grants are usually made for very limited times. Indirect costs, or overhead, are usually not fully covered by external funding and must be covered in part by institutional funds. A small amount of facilities investment is funded by the federal, state and local governments. Most facilities are funded by the institutions themselves. Applied research, manufacturing development, and late-stage product development are generally funded by pharmaceutical and biotechnology company investment. *Innovation research as well as substantial portions of all other stages of the academic biomedical research and development process are funded by academic institutional revenues. Institution funds are required before, during and after the limited time frame of external grants.*

## BIOMEDICAL RESEARCH INSTITUTIONS IN PENNSYLVANIA

As shown in Figure 1 (page 9), the biomedical research process is performed and funded by a number of different types of institutions in both the public and private sectors. The diagram clearly illustrates the role of academic and other research institutions in the early stages of biomedical research--innovation research and basic research--and the later states of biomedical development--product development, pivotal clinical trials, statistical analysis, and the creation of new drug applications. The diagram also shows the roles of private sector biotechnology and pharmaceutical companies in the transfer of technology from the academic and other research institutions for the intermediate stages of biomedical research--applied research and pre-clinical development.

In Pennsylvania, a large proportion of academic biomedical research is performed by the six universities with schools of medicine: MCP Hahnemann University; the Pennsylvania State University; Temple University; Thomas

Jefferson University; the University of Pennsylvania; and the University of Pittsburgh. Like those in other states, the Commonwealth's medical schools play a key role in the formulation of testable hypotheses for advances in therapeutic and diagnostic medicine and in the later testing of the products and processes that result from these hypotheses. Medical schools are dominant in attracting awards and gifts from various government and private sources, as well as in earning licensing and royalty revenues from the development, production and marketing of their products by private biotechnology and pharmaceutical companies.

However, the medical schools and their affiliated hospitals are not the only important academic contributors to biomedical research in Pennsylvania. Significant innovation and basic research is also performed by academic institutions without medical schools, research organizations, independent hospitals and numerous other types of institutions.[6] These institutions also attract substantial federal research awards for basic research and earn substantial licensing fees and royalties for technology transfers. A complete listing of the institutions in Pennsylvania that received basic research awards from the National Institutes of Health for the years 1989 to 1998 is shown in appendix A1 (pages 68-94). A roster of Pennsylvania's major private biotechnology and pharmaceutical companies is given in appendix E (pages 178-179). While not an exhaustive inventory, these two lists include most of the important biomedical research institutions in Pennsylvania.

## SOME MEASURES OF THE LEVEL OF BIOMEDICAL RESEARCH IN THE COMMONWEALTH

A fully comprehensive measure of the level of biomedical research in Pennsylvania--either in dollars or the number of researchers--is not available. However, reliable measures of some of the major parts of the biomedical R&D process described above are available and can be used to show the levels of important stages of this process, as well as changes in the levels over the past decade. These measures will be used to illustrate the major strengths and weaknesses of biomedical research in Pennsylvania in section II.

> Innovation research--The level of innovation research cannot readily be determined for Pennsylvania's biomedical research institutions. Pilot research has traditionally been funded by the academic institutions that perform this research with institutional revenues--hospital patient and clinical revenues,

[6] In fact, the working group believes that in the Age of Biology, nonmedical school universities will substantially increase their efforts in the life sciences, causing the spending of nonmedical schools to rise relative to medical schools.

departmental funds, private grants, license fees, etc. Data on the institutional funding of innovation research are not ordinarily made available by the institutions to the public, and assembling these data for the numerous and disparate institutions in the Commonwealth is beyond the reach of this working group.[7] Nonetheless, the level of innovation research, and changes in the level in recent years, are of primary importance. As will be discussed in section II, funds available in academic institutions for innovation research have been severely impacted by changes in federal budgets and programs, the health care environment and private market conditions. Unfortunately, the effects of these changes on innovation research in Pennsylvania will have to be dealt with in an indirect manner.

Basic research--Expenditure data for the basic biomedical research performed by institutions, detailed by funding source--the federal government, state and local governments, industry, the institutions, and all other funding sources--are also not available for Pennsylvania or other individual states. However, data compiled by the National Science Foundation on expenditures for the basic science and engineering research performed by universities and colleges and funded by these various sectors are available for the U.S. as a whole. The U.S. data can be used to estimate state-level academic research expenditures by funding source for the various process stages.

United States data showing the funding of all academic science and engineering research expenditures by all funding sources for 1998, and the years 1989 to 1998, are presented in table 1 (page 15).

[7] In fact, totally reliable data on the level of innovation research may simply not be available because of institutional inconsistencies in the recording of release times for the clinical and other research functions performed by persons primarily employed as medical school teachers and administrators.

Table 1

TOTAL FUNDING OF ALL UNIVERSITY AND COLLEGE
SCIENCE AND ENGINEERING RESEARCH
AND DEVELOPMENT EXPENDITURES FOR THE U.S.
BY FUNDING SOURCES
1998 AND 1989 TO 1998
(Dollars in thousands)

| Funding source | 1998 Amount | 1998 Percentage of U.S. total | 1989 to 1998 Amount | 1989 to 1998 Growth rate | 1989 to 1998 Percentage of U.S. total |
|---|---|---|---|---|---|
| Federal | $14,810,417 | 58.4% | $119,129,328 | 7.5% | 59.4% |
| State and local | 1,893,996 | 7.5 | 15,604,430 | 6.4 | 7.8 |
| Industry | 1,848,571 | 7.3 | 13,804,753 | 9.9 | 6.9 |
| Institutional | 4,963,671 | 19.6 | 37,344,839 | 9.5 | 18.6 |
| Other* | 1,825,108 | 7.2 | 14,620,625 | 8.1 | 7.3 |
| U.S. total | 25,341,760 | 100.0 | 200,503,975 | 8.0 | 100.0 |

*Primarily nonprofit institutions.

SOURCE: National Science Foundation/SRS, *Survey of Research and Development Expenditures at Universities and Colleges, Fiscal Years 1996, 1997 and 1998*.

Other NSF data show that, nationally, about 67 percent of the total science and engineering R&D expenditures by universities and colleges are made for basic research, about 25 percent for applied research, and about 8 percent for development.[8] Between 1989 and 1998, the expenditure proportions for basic research and development increased slightly, and the proportion for applied research decreased slightly. Applying these national proportions to NSF state data, for which no process-stage breakdowns are available, process-stage R&D expenditures can be estimated at the state level for universities and colleges.[9]

The estimated funding of academic science and engineering basic research expenditures by all funding sectors for 1998 and the years 1989 to 1998, for Pennsylvania, six selected states and the U.S. total, are given in table 2 (page 16).[10]

[8]National Science Foundation, National Science Board, *Science & Engineering Indicators (*Arlington, VA*, 1998)*.

[9]While yielding useful approximations, this estimation technique results in the same distribution of funding sources for all process stages for each state.

[10]The selected states comprised the top ten in NIH dollar awards in 1998, and each have five or more academic medical centers. Maryland, North Carolina and Washington have less than five academic medical centers and are not included.

Table 2

ESTIMATED ACADEMIC SCIENCE AND ENGINEERING
BASIC RESEARCH EXPENDITURES
FOR PENNSYLVANIA AND SELECTED STATES
BY FUNDING SOURCE, 1998 AND 1989 TO 1998
(Dollars in thousands)

| State and funding source | 1998 Amount | 1998 Percentage of state total | 1989 to 1998 Amount | 1989 to 1998 Growth rate | 1989 to 1998 Percentage of state total |
|---|---|---|---|---|---|
| California | | | | | |
| Federal | $1,329,711 | 60.1% | $11,147,396 | 6.5% | 67.2% |
| State & local | 93,742 | 4.2 | 674,874 | 25.4 | 4.1 |
| Industry | 138,935 | 6.3 | 790,043 | 17.2 | 4.8 |
| Institutional | 468,736 | 21.2 | 2,759,654 | 13.7 | 16.6 |
| Other | 181,197 | 8.2 | 1,207,129 | 15.3 | 7.3 |
| Total | 2,212,321 | 100.0 | 16,579,095 | 9.2 | 100.0 |
| Illinois | | | | | |
| Federal | 384,614 | 55.9 | 2,919,848 | 8.2 | 55.8 |
| State & local | 35,966 | 5.2 | 312,233 | 6.9 | 6.0 |
| Industry | 39,150 | 5.7 | 309,015 | 5.9 | 5.9 |
| Institutional | 174,500 | 25.4 | 1,272,903 | 8.6 | 24.3 |
| Other | 53,458 | 7.8 | 417,902 | 11.1 | 8.0 |
| Total | 687,687 | 100.0 | 5,231,900 | 8.3 | 100.0 |
| Massachusetts | | | | | |
| Federal | 653,392 | 73.8 | 5,182,632 | 6.7 | 71.4 |
| State & local | 20,996 | 2.4 | 124,375 | 8.1 | 1.7 |
| Industry | 70,887 | 8.0 | 627,757 | 4.2 | 8.6 |
| Institutional | 64,738 | 7.3 | 594,682 | 7.6 | 8.2 |
| Other | 75,788 | 8.6 | 728,331 | 3.2 | 10.0 |
| Total | 885,802 | 100.0 | 7,257,776 | 6.2 | 100.0 |
| New York | | | | | |
| Federal | 800,543 | 63.5 | 6,917,123 | 4.8 | 65.2 |
| State & local | 52,861 | 4.2 | 523,017 | 2.0 | 4.9 |
| Industry | 62,573 | 5.0 | 588,627 | 3.9 | 5.5 |
| Institutional | 190,126 | 15.1 | 1,399,812 | 7.8 | 13.2 |
| Other | 154,834 | 12.3 | 1,185,626 | 6.7 | 11.2 |
| Total | 1,260,936 | 100.0 | 10,614,204 | 5.2 | 100.0 |
| Ohio | | | | | |
| Federal | 296,192 | 54.9 | 2,291,547 | 9.6 | 56.8 |
| State & local | 49,852 | 9.2 | 356,646 | 6.5 | 8.8 |
| Industry | 58,959 | 10.9 | 364,827 | 15.5 | 9.0 |
| Institutional | 101,302 | 18.8 | 671,010 | 16.6 | 16.6 |
| Other | 33,054 | 6.1 | 353,119 | 4.0 | 8.7 |
| Total | 539,360 | 100.0 | 4,037,150 | 10.3 | 100.0 |
| **Pennsylvania** | | | | | |
| **Federal** | **581,130** | **65.1** | **4,511,605** | **9.9** | **64.9** |
| **State & local** | **28,923** | **3.2** | **212,129** | **4.0** | **3.1** |
| **Industry** | **104,293** | **11.7** | **770,709** | **8.2** | **11.1** |
| **Institutional** | **132,449** | **14.8** | **1,036,266** | **9.4** | **14.9** |
| **Other** | **46,467** | **5.2** | **422,607** | **2.3** | **6.1** |
| **Total** | **893,261** | **100.0** | **6,953,315** | **8.8** | **100.0** |
| Texas | | | | | |
| Federal | 594,847 | 53.2 | 4,579,602 | 9.6 | 49.9 |
| State & local | 116,727 | 10.4 | 1,031,491 | 4.9 | 11.2 |
| Industry | 93,596 | 8.4 | 648,254 | 13.9 | 7.1 |
| Institutional | 192,403 | 17.2 | 1,821,561 | 4.4 | 19.9 |
| Other | 119,756 | 10.7 | 1,091,767 | 4.7 | 11.9 |
| Total | 1,117,328 | 100.0 | 9,172,676 | 7.6 | 100.0 |
| U.S. total | | | | | |
| Federal | 9,922,979 | 58.4 | 79,351,975 | 7.9 | 59.4 |
| State & local | 1,268,977 | 7.5 | 10,391,276 | 6.8 | 7.8 |
| Industry | 1,238,543 | 7.3 | 9,195,922 | 10.4 | 6.9 |
| Institutional | 3,325,660 | 19.6 | 24,875,416 | 10.0 | 18.6 |
| Other | 1,222,822 | 7.2 | 9,738,238 | 8.5 | 7.3 |
| Total | 16,978,979 | 100.0 | 133,552,827 | 8.4 | 100.0 |

SOURCE: Estimations--National Science Foundation, National Science Board, *Science & Engineering Indicators--1998*. Appendix tables 4-3, 4-7, 4-11, 4-15; Data--National Science Foundation/SRS, *Survey of Research and Development Expenditures at Universities and Colleges, Fiscal Years 1996-1998*.

Table 2 (page 16) shows that basic research expenditures by academic institutions in Pennsylvania are funded at higher than average rates by the federal government and industry, and at lower than average rates by state and local governments, institutions, and other revenue sources when compared to the U.S. total. State and local government funding of basic research is also lower in Pennsylvania than any other selected state, except Massachusetts. In Pennsylvania, only the growth of funding from the federal government has exceeded the U.S. averages over the past ten years. The growth of funding from the Commonwealth, and its local governments and other sources has been especially low during this time period. Significantly, Pennsylvania's academic institutions spend about 18 cents of their own funds for each dollar received from all external sources for basic research (the U.S. average is about 23 cents).

The NSF data show that the federal government is the largest source of funds for academic science and engineering basic research and development in Pennsylvania and the other states. Through its 21 individual institutes, the NIH funds about three-fourths of the federal total through various types of awards for basic biomedical research,[11] primarily made through a peer-review process.[12] Other federal awards are made by the NSF, the Department of Defense, and other federal agencies.

NIH awards to all Pennsylvania recipients totaled $735.2 million in 1998 (up from $681.3 million in 1997), and $5.5 billion from 1989 to 1998; NIH awards to Pennsylvania academic institutions were $605.4 million in 1998 (82 percent of the total). The total number of NIH awards was 2,706 in 1998, and 22,772 for the years 1989 to 1998. The average dollar NIH award was $271,676 in 1998, and $239,691 for the ten-year period. During these ten years, total dollar NIH awards grew by an average of 10.2 percent per year, the number of NIH awards by 4.5 percent per year, and the average dollar NIH award by 4.1 percent per year.

The total awards made by the various institutes of the NIH to all institutions in Pennsylvania are given in table 3 (page 18).

[11]Not all NIH awards are made to academic institutions for basic research; some awards are also made to clinical departments. However, data on the allocation of awards to these two process stages are not reliable. Since most of the awards are made to basic research departments, all NIH awards are included in the basic research process stage in this report.

[12]Applications for funding are evaluated in the NIH by study groups of biomedical research experts. Competition for awards is highly competitive. The peer-review process contributes to the objective evaluation of research project proposals.

Table 3

TOTAL NIH AWARDS FOR PENNSYLVANIA BY NIH GRANTING INSTITUTE
(Dollars in thousands)

| NIH institute | 1998 Amount | 1998 Percentage of total | 1989 to 1998 Amount | 1989 to 1998 Percentage of total |
|---|---|---|---|---|
| Cancer | $130,973 | 17.8% | $1,095,627 | 20.1% |
| Heart, lung and blood | 95,409 | 13.0 | 677,895 | 12.4 |
| Mental health | 73,792 | 10.0 | 522,116 | 9.6 |
| General medical sciences | 53,197 | 7.2 | 401,626 | 7.4 |
| Neurological disorders and stroke | 51,937 | 7.1 | 383,481 | 7.0 |
| Diabetes and digestive kidney disease | 51,669 | 7.0 | 373,050 | 6.8 |
| Allergy and infectious diseases | 52,240 | 7.1 | 338,462 | 6.2 |
| Child health and human development | 44,036 | 6.0 | 295,579 | 5.4 |
| Drug abuse | 26,112 | 3.6 | 226,915 | 4.2 |
| Aging | 33,075 | 4.5 | 203,418 | 3.7 |
| All other | 122,716 | 16.7 | 940,079 | 17.2 |
| Pennsylvania total | 735,156 | 100.0 | 5,458,246 | 100.0 |

SOURCE: Data provided by the Office of Reports and Analysis, Office of Extramural Research, National Institutes of Health, Bethesda, MD, August 1999.

Table 3 shows that the largest NIH awards are made by the National Cancer Institute, the National Heart, Lung and Blood Institute, and the National Institute of Mental Health. Substantial dollar awards are also made by other NIH institutes to Pennsylvania recipients.

Total NIH awards were made to many different types of institutions in Pennsylvania, as shown in table 4.

Table 4

TOTAL NIH AWARDS FOR PENNSYLVANIA BY TYPE OF INSTITUTION
(Dollars in thousands)

| Facility type | 1998 Amount | 1998 Percentage of total | 1989 to 1998 Amount | 1989 to 1998 Percentage of total |
|---|---|---|---|---|
| Institutions of higher education | $605,402 | 82.4% | $4,318,844 | 79.1% |
| Research organizations, institutes | 63,114 | 8.6 | 645,697 | 11.8 |
| Independent hospitals | 49,844 | 6.8 | 385,973 | 7.1 |
| Education organizations other than higher education | 0 | 0.0 | 1,161 | 0.0 |
| Other health, human resource and community service organizations | 2,648 | 0.4 | 28,610 | 0.5 |
| Other | 14,148 | 1.9 | 77,960 | 1.4 |
| Pennsylvania total | 735,156 | 100.0 | 5,458,246 | 100.0 |

SOURCE: Data provided by the Office of Reports and Analysis, Office of Extramural Research, National Institutes of Health, Bethesda, MD, August 1999.

Table 4 (page 18) shows that the preponderance of NIH total dollar awards is made in the Commonwealth to institutions of higher education. Furthermore, about 62 percent of these awards were made to Pennsylvania's medical schools in 1998; for the years 1989 to 1998, the medical school percentage was about 59 percent.

Total NIH dollar awards were made to Pennsylvania recipients for a variety of purposes, as detailed in table 5.

Table 5

TOTAL NIH AWARDS FOR PENNSYLVANIA BY PURPOSE
(Dollars in thousands)

| Purpose | 1998 Amount | 1998 Percentage of total | 1989 to 1998 Amount | 1989 to 1998 Percentage of total |
|---|---|---|---|---|
| Research projects | $453,876 | 61.7% | $3,282,146 | 60.1% |
| Research program projects and centers | 156,900 | 21.3 | 1,121,623 | 20.6 |
| Cooperative agreements | 40,552 | 5.5 | 406,439 | 7.5 |
| Training program | 23,470 | 3.2 | 184,097 | 3.4 |
| R&D-related contracts | 19,114 | 2.6 | 177,866 | 3.3 |
| All other* | 41,244 | 5.6 | 286,076 | 5.2 |
| Pennsylvania total | 735,156 | 100.0 | 5,458,246 | 100.0 |

*Includes research construction, training grants, fellowship programs, resource programs, research career programs, general clinical research centers programs, and research-related programs. In total, all NIH research grants, as defined by NIH, were $5,046,387,000 (92.5 percent of the total awards) for the ten-year period.

SOURCE: Data provided by the Office of Reports and Analysis, Office of Extramural Research, National Institutes of Health, Bethesda, MD, August 1999.

Table 5 shows that the majority of NIH dollar total awards are made to Pennsylvania institutions directly for research projects. The balance is made for purposes indirectly related to research projects, as well as training, etc.

Total NIH dollar awards for all purposes were made to a large number of individual recipients in Pennsylvania, as shown in table 6 (page 20).

Table 6 shows that, in 1998, two Pennsylvania universities with large medical centers--the University of Pennsylvania and the University of Pittsburgh--received $415.2 million in awards from NIH, representing more than 56 percent of the Commonwealth's total.

Table 6

LARGEST TOTAL NIH AWARDS FOR PENNSYLVANIA
BY INDIVIDUAL INSTITUTION*
(Dollars in thousands)

| Facility | 1998 Amount | 1998 Percentage of total | 1989 to 1998 Amount | 1989 to 1998 Percentage of total |
|---|---|---|---|---|
| Albert Einstein Medical Center | $134 | 0.0% | $3,686 | 0.1% |
| Allegheny University of Health Sciences | 33,657 | 4.6 | 205,276 | 3.8 |
| Allegheny-Singer Research Institute | 3,700 | 0.8 | 41,751 | 0.5 |
| Bryn-Mawr College | 229 | 0.0 | 3,782 | 0.1 |
| Carnegie Mellon University | 10,991 | 1.5 | 91,105 | 1.7 |
| Children's Hospital of Philadelphia | 33,494 | 4.6 | 211,332 | 3.9 |
| Children's Hospital of Pittsburgh | 5,164 | 0.7 | 61,193 | 1.1 |
| Drexel University | 2,311 | 0.3 | 15,919 | 0.3 |
| Duquesne University | 962 | 0.1 | 3,193 | 0.1 |
| Fox Chase Cancer Center | 23,895 | 3.3 | 196,686 | 3.6 |
| Geisinger Medical Center | 177 | 0.0 | 3,001 | 0.1 |
| Graduate Hospital (Philadelphia) | 317 | 0.0 | 13,917 | 0.3 |
| Hahnemann University | 0 | 0.0 | 49,784 | 0.9 |
| Information Ventures, Inc. | 875 | 0.1 | 10,981 | 0.2 |
| Institute for Cancer Research | 8,921 | 1.2 | 94,795 | 1.7 |
| Lankenou Medical Research Center | 1,908 | 0.3 | 13,112 | 0.2 |
| Lehigh University | 1,089 | 0.1 | 7,847 | 0.1 |
| Magee-Women's Hospital | 8,223 | 1.1 | 32,317 | 0.6 |
| Mellon Pitts Corporation | 3,162 | 0.4 | 21,043 | 0.4 |
| Mercy Catholic Medical Center | 0 | 0.0 | 3,685 | 0.1 |
| Monnell Chemical Sciences Center | 3,710 | 0.5 | 34,691 | 0.6 |
| Moss Rehabilitation Hospital | 824 | 0.1 | 5,941 | 0.1 |
| National Disease Research Interchange | 567 | 0.1 | 13,395 | 0.2 |
| NIM, Inc. | 373 | 0.1 | 3,755 | 0.1 |
| PA College of Optometry | 621 | 0.1 | 3,984 | 0.1 |
| PA Hospital (Philadelphia) | 0 | 0.0 | 3,877 | 0.1 |
| PSU - Hershey Medical Center | 30,002 | 4.1 | 237,561 | 4.4 |
| PSU - University Park | 29,608 | 4.0 | 209,727 | 3.8 |
| Philadelphia Fight | 824 | 0.1 | 3,212 | 0.1 |
| Phila. Geriatric Center - Friedman Hospital | 420 | 0.1 | 22,014 | 0.4 |
| Phila. Health Management Corporation | 0 | 0.0 | 6,663 | 0.1 |
| Presbyterian Medical Center of Philadelphia | 0 | 0.0 | 7,170 | 0.1 |
| Temple University | 23,834 | 3.2 | 215,306 | 3.9 |
| Thomas Jefferson University | 55,683 | 7.6 | 383,039 | 7.0 |
| Transcoil, Inc. | 868 | 0.1 | 5,122 | 0.1 |
| University City Science Center | 675 | 0.1 | 24,789 | 0.5 |
| University of PA | 246,153 | 33.5 | 1,633,777 | 29.9 |
| University of Pittsburgh (at Pittsburgh) | 169,042 | 23.0 | 1,244,900 | 22.8 |
| Weis Center for Res-Geisinger Clinic | 238 | 0.0 | 14,872 | 0.3 |
| Wills Eye Hospital (Phila.) | 163 | 0.0 | 3,116 | 0.1 |
| Wistar Institute | 15,217 | 2.1 | 162,814 | 3.0 |
| Pennsylvania total | 735,156 | 100.0 | 5,458,246 | 100.0 |

*Includes institutions with total awards of $3 million or more for 1989 to 1998.

SOURCE: Data provided by the Office of Reports and Analysis, Office of Extramural Research, National Institutes of Health, Bethesda, MD, August 1999.

Together, the Commonwealth's universities with medical centers received $588.0 million in NIH funding, about 80 percent of Pennsylvania's total. Overall, the 23 universities and colleges in Pennsylvania which received NIH funding collected $605.4 million, about 82 percent of the Commonwealth total;[13] the remaining $129.8 million in NIH awards were made to nonacademic institutions, primarily private companies. In the institutions that do not have medical schools, the largest NIH award totals went to Children's Hospital of Philadelphia, Fox Chase Cancer Center, Wistar Institute, and Carnegie Mellon University.

The total NIH dollar awards for all purposes to all institutions in Pennsylvania and the six selected states, with growth rates and U.S. shares for the years 1989 to 1998, are given in table 7.

Table 7

TOTAL NIH AWARDS FOR PENNSYLVANIA
AND SELECTED OTHER STATES
1989 to 1998
(Dollars in thousands)

| State | Amount | Growth rate* | Share of U.S. total |
|---|---|---|---|
| California | $12,783,755 | 8.0% | 14.6% |
| New York | 9,432,650 | 4.6 | 10.8 |
| Massachusetts | 8,920,133 | 8.4 | 10.2 |
| **Pennsylvania** | **5,458,246** | **10.2** | **6.3** |
| Texas | 4,209,241 | 9.5 | 4.8 |
| Illinois | 2,667,809 | 7.4 | 3.1 |
| Ohio | 2,445,674 | 10.6 | 2.8 |
| U.S. total | 87,295,549 | 7.8 | 100.0 |

*Average annual growth rate.

SOURCE: Data provided by the Office of Reports and Analysis, Office of Extramural Research, National Institutes of Health, Bethesda, MD, August 1999.

[13]In the nonmedical school institutions, a large proportion of external funding often comes from non-NIH sources, e.g., other federal government agencies, industry, etc.

Table 7 (page 21) shows that Pennsylvania ranks fourth in total dollar NIH awards (and share of U.S. total), and second in the growth of total dollar NIH awards when compared to the selected states for the ten-year period. Pennsylvania holds these same ranks for the nation as a whole.

The number of principal investigators is another appropriate measure of the level of basic research. Principal investigators in basic research projects can be estimated from the number of NIH awards.[14] Based on the number of NIH awards to all institutions and the estimation formula, there were about 1,610 principal investigators in basic research projects in Pennsylvania in 1998 (up from about 1,519 in 1997) and a total of about 13,463 principal investigators in basic research projects in the Commonwealth during the years 1989 to 1998.[15] During the ten years, estimated principal investigators grew by 4.5 percent per year.

The estimated number of principal investigators in Pennsylvania and the selected states listed above, with growth rates and U.S. shares for the years 1989 to 1998, is given in table 8 (page 23).

Table 8 shows that Pennsylvania ranks fourth in principal investigators in basic research (and share of U.S. total) and first (tied with Ohio) in the growth of principal investigators in basic research projects when compared to the selected states for the ten-year period. Principal investigators in Pennsylvania have grown faster than the U.S. total over the past decade.

Whether measured by academic research expenditures, NIH dollar awards or principal investigators, the analysis of the level of basic biomedical research in Pennsylvania leads to several important conclusions. These measures indicate that basic academic biomedical research in Pennsylvania is very large and has grown very rapidly over the past decade when compared to similar states. The Commonwealth's shares of academic research expenditures and NIH awards and the number of principal investigators rank high among comparable states.

[14]The estimation procedure was suggested by the NIH Office of Reports and Analysis. The estimation formula is: unique principal investigators = NIH Research Project awards/1.2. Research Project is an NIH budget concept, and includes primarily investigator-initiated, basic scientific research.

[15]For the ten-year period, a principal investigator is counted in each year during which he received an NIH award, i.e., the same person may be counted in multiple years.

Table 8

ESTIMATED PRINCIPLE INVESTIGATORS
IN BASIC BIOMEDICAL RESEARCH
PENNSYLVANIA AND SELECTED OTHER STATES
1989 to 1998

| State | Number | Growth rate* | Share of U.S. total |
|---|---|---|---|
| California | 27,847 | 1.9% | 13.7% |
| Illinois | 7,647 | 1.7 | 3.8 |
| Massachusetts | 18,892 | 3.4 | 9.3 |
| New York | 22,398 | 0.8 | 11.0 |
| Ohio | 6,602 | 4.5 | 3.2 |
| **Pennsylvania** | **13,463** | **4.5** | **6.6** |
| Texas | 11,494 | 2.1 | 5.7 |
| U.S. total | 203,412 | 2.4 | 100.0 |

*Average annual growth rate.

SOURCE: The estimation procedure was suggested by the Office of Reports and Analysis; Office of Extramural Research, National Institutes of Health, Bethesda, MD. The estimation formula is: unique principal investigators = NIH Research Project awards/1.2.

Appendices A1 to A3 (pages 68-142) contain total NIH dollar awards, numbers of the NIH awards and average NIH dollar awards for all institutions in Pennsylvania for the years 1989 to 1998; appendices B1 to B3 (pages 143-145) have data for Pennsylvania medical schools in the same format for these years. Appendices C1 to C3 (pages 146-162) have total NIH dollar awards, numbers of NIH awards and average dollar NIH awards for all institutions in all states in the U.S. for the years 1989 to 1998; appendices D1 to D3 (pages 163-177) have medical school data in the same format for these years for each state in the United States.

Applied research--The estimated funding of academic science and engineering applied research expenditures by all funding sources for 1998 and the years 1989 to 1998 for Pennsylvania, the six selected states and the U.S. total, are shown in table 9 (page 24).

Table 9

ESTIMATED ACADEMIC SCIENCE AND ENGINEERING
APPLIED RESEARCH EXPENDITURES
FOR PENNSYLVANIA AND SELECTED STATES
BY FUNDING SOURCE, FOR 1998 AND 1989 TO 1998
(Dollars in thousands)

| State and funding source | 1998 Amount | 1998 Percentage of state total | 1989 to 1998 Amount | 1989 to 1998 Growth rate | 1989 to 1998 Percentage of state total |
|---|---|---|---|---|---|
| California | | | | | |
| Federal | $494,176 | 60.1% | $4,224,516 | 4.8% | 67.3% |
| State & local | 34,839 | 4.2 | 254,323 | 21.9 | 4.0 |
| Industry | 51,634 | 6.3 | 298,805 | 14.5 | 4.8 |
| Institutional | 174,202 | 21.2 | 1,046,608 | 11.3 | 16.7 |
| Other | 67,341 | 8.2 | 456,549 | 12.8 | 7.3 |
| Total | 822,191 | 100.0 | 6,280,801 | 7.2 | 100.0 |
| Illinois | | | | | |
| Federal | 142,938 | 55.9 | 1,106,195 | 6.4 | 55.8 |
| State & local | 13,366 | 5.2 | 118,412 | 5.2 | 6.0 |
| Industry | 14,550 | 5.7 | 117,417 | 4.3 | 5.9 |
| Institutional | 64,852 | 25.4 | 482,659 | 6.7 | 24.3 |
| Other | 19,867 | 7.8 | 158,182 | 8.9 | 8.0 |
| Total | 255,573 | 100.0 | 1,982,865 | 6.4 | 100.0 |
| Massachusetts | | | | | |
| Federal | 242,828 | 73.8 | 1,964,938 | 5.0 | 71.4 |
| State & local | 7,803 | 2.4 | 47,194 | 6.3 | 1.7 |
| Industry | 26,345 | 8.0 | 238,354 | 2.7 | 8.7 |
| Institutional | 24,059 | 7.3 | 224,713 | 5.8 | 8.2 |
| Other | 28,166 | 8.6 | 276,354 | 1.8 | 10.0 |
| Total | 329,201 | 100.0 | 2,751,552 | 4.6 | 100.0 |
| New York | | | | | |
| Federal | 297,515 | 63.5 | 2,624,152 | 3.3 | 65.2 |
| State & local | 19,645 | 4.2 | 198,649 | 0.7 | 4.9 |
| Industry | 23,255 | 5.0 | 223,376 | 2.5 | 5.5 |
| Institutional | 70,659 | 15.1 | 530,820 | 6.0 | 13.2 |
| Other | 57,543 | 12.3 | 449,180 | 5.0 | 11.2 |
| Total | 468,617 | 100.0 | 4,026,178 | 3.6 | 100.0 |
| Ohio | | | | | |
| Federal | 110,077 | 54.9 | 867,343 | 7.6 | 56.8 |
| State & local | 18,527 | 9.2 | 135,437 | 4.8 | 8.9 |
| Industry | 21,912 | 10.9 | 137,874 | 13.0 | 9.0 |
| Institutional | 37,648 | 18.8 | 253,306 | 13.9 | 16.6 |
| Other | 12,284 | 6.1 | 133,998 | 2.6 | 8.8 |
| Total | 200,449 | 100.0 | 1,527,958 | 8.3 | 100.0 |
| **Pennsylvania** | | | | | |
| **Federal** | **215,972** | **65.1** | **1,707,263** | **7.9** | **64.8** |
| **State & local** | **10,749** | **3.2** | **80,628** | **2.6** | **3.1** |
| **Industry** | **38,760** | **11.7** | **292,215** | **6.3** | **11.1** |
| **Institutional** | **49,224** | **14.8** | **392,532** | **7.5** | **14.9** |
| **Other** | **17,269** | **5.2** | **160,604** | **1.1** | **6.1** |
| **Total** | **331,973** | **100.0** | **2,633,241** | **6.9** | **100.0** |
| Texas | | | | | |
| Federal | 221,070 | 53.2 | 1,733,172 | 7.6 | 49.9 |
| State & local | 43,381 | 10.4 | 391,184 | 3.4 | 11.3 |
| Industry | 34,784 | 8.4 | 245,214 | 11.5 | 7.1 |
| Institutional | 71,505 | 17.2 | 691,333 | 2.9 | 19.9 |
| Other | 44,506 | 10.7 | 414,217 | 3.2 | 11.9 |
| Total | 415,246 | 100.0 | 3,475,121 | 5.8 | 100.0 |
| U.S. total | | | | | |
| Federal | 3,687,794 | 58.4 | 30,055,575 | 6.1 | 59.4 |
| State & local | 471,605 | 7.5 | 3,939,547 | 5.1 | 7.8 |
| Industry | 460,294 | 7.3 | 3,482,193 | 8.3 | 6.9 |
| Institutional | 1,235,954 | 19.6 | 9,420,855 | 8.0 | 18.6 |
| Other | 454,452 | 7.2 | 3,688,644 | 6.6 | 7.3 |
| Total | 6,310,098 | 100.0 | 50,586,814 | 6.5 | 100.0 |

SOURCE: Estimations--National Science Foundation, National Science Board, *Science & Engineering Indicators--1998*. Appendix tables 4-3, 4-7, 4-11, 4-15; Data--National Science Foundation/SRS, *Survey of Research and Development Expenditures at Universities and Colleges, Fiscal Years 1996-1998*.

Table 9 (page 24) shows that expenditures for applied research are about one-third of the expenditures for basic research in Pennsylvania's academic institutions. Moreover, the 1989 to 1998 growth of funding for applied academic research from all funding sources is *lower* than the growth of funding for basic academic research (see Table 2).

Development--The estimated funding of academic science and engineering development expenditures by all funding sources for 1998 and the years 1989 to 1998 for Pennsylvania, the six selected states and the U.S. total, are given in table 10 (page 26).

Table 10 shows that expenditures for development are about one-eighth of the expenditures for basic research in Pennsylvania's academic institutions (see Table 2). However, the 1989 to 1998 growth of funding for academic development expenditures from all funding sources is *higher* than the growth of funding for both basic and applied academic research expenditures (see Tables 2 and 9).

Combining the data in tables 2, 9 and 10--which show separate estimates of the basic research, applied research, and development-stage science and engineering expenditures by the academic institutions in the selected states--reveals a very important fact. For 1998, the percentage of total academic science and engineering R&D expenditures funded in these states by state and local governments to those funded by federal government were: 19.6 percent in Texas; 16.8 percent in Ohio; 9.4 percent in Illinois; 7.0 percent in California; 6.6 percent in New York; 5.0 percent in Pennsylvania; and 3.2 percent in Massachusetts. The average state and local to federal ratio for academic R&D funding in the U.S. was 12.8 percent. The state rankings and U.S. average are portrayed in figure 2 (page 27). The low funding of academic R&D by Pennsylvania and its local governments has a damaging effect on academic biomedical research. Funding from these governments is typically used in all stages of the academic R&D process. Significant results from the innovation research stage are needed to attract federal funding for the basic research stage. External funds from all sources fail to completely fund the later stages of academic research and development. Without help from Pennsylvania and its local governments, the academic institutions are forced to use more of their own funds for research.

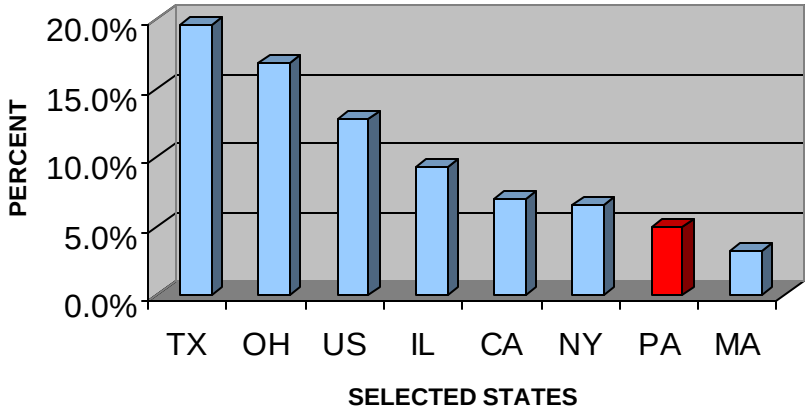
Table 10

ESTIMATED ACADEMIC SCIENCE AND ENGINEERING
DEVELOPMENT EXPENDITURES
FOR PENNSYLVANIA AND SELECTED STATES
BY FUNDING SOURCE, 1998 AND 1989 TO 1998
(Dollars in thousands)

| State and funding source | 1998 Amount | 1998 Percentage of state total | 1989 to 1998 Amount | 1989 to 1998 Growth rate | 1989 to 1998 Percentage of state total |
|---|---|---|---|---|---|
| California | | | | | |
| Federal | $160,756 | 60.1% | $1,365,705 | 6.9% | 67.2% |
| State & local | 11,333 | 4.2 | 82,751 | 26.4 | 4.1 |
| Industry | 16,797 | 6.3 | 96,602 | 18.0 | 4.8 |
| Institutional | 56,668 | 21.2 | 338,241 | 14.3 | 16.7 |
| Other | 21,906 | 8.2 | 147,848 | 16.0 | 7.3 |
| Total | 267,460 | 100.0 | 2,031,147 | 9.7 | 100.0 |
| Illinois | | | | | |
| Federal | 46,498 | 55.9 | 357,612 | 8.7 | 55.8 |
| State & local | 4,348 | 5.2 | 38,339 | 7.4 | 6.0 |
| Industry | 4,733 | 5.7 | 37,911 | 6.4 | 5.9 |
| Institutional | 21,096 | 25.4 | 155,978 | 9.1 | 24.3 |
| Other | 6,463 | 7.8 | 51,261 | 11.7 | 8.0 |
| Total | 83,138 | 100.0 | 641,101 | 8.8 | 100.0 |
| Massachusetts | | | | | |
| Federal | 78,992 | 73.8 | 635,080 | 7.2 | 71.4 |
| State & local | 2,538 | 2.4 | 15,176 | 8.7 | 1.7 |
| Industry | 8,570 | 8.0 | 76,977 | 4.6 | 8.7 |
| Institutional | 7,827 | 7.3 | 72,800 | 8.1 | 8.2 |
| Other | 9,162 | 8.6 | 89,410 | 3.6 | 10.1 |
| Total | 107,089 | 100.0 | 889,444 | 6.7 | 100.0 |
| New York | | | | | |
| Federal | 96,782 | 63.5 | 847,932 | 5.2 | 65.2 |
| State & local | 6,391 | 4.2 | 64,141 | 2.4 | 4.9 |
| Industry | 7,565 | 5.0 | 72,215 | 4.4 | 5.6 |
| Institutional | 22,985 | 15.1 | 171,476 | 8.3 | 13.2 |
| Other | 18,719 | 12.3 | 145,166 | 7.2 | 11.2 |
| Total | 152,442 | 100.0 | 1,300,929 | 5.7 | 100.0 |
| Ohio | | | | | |
| Federal | 35,808 | 54.9 | 280,727 | 10.2 | 56.8 |
| State & local | 6,027 | 9.2 | 43,696 | 7.0 | 8.8 |
| Industry | 7,128 | 10.9 | 44,579 | 16.3 | 9.0 |
| Institutional | 12,247 | 18.8 | 82,067 | 17.4 | 16.6 |
| Other | 3,996 | 6.1 | 43,411 | 4.5 | 8.8 |
| Total | 65,206 | 100.0 | 494,479 | 10.9 | 100.0 |
| **Pennsylvania** | | | | | |
| **Federal** | **70,256** | **65.1** | **552,646** | **10.5** | **64.9** |
| **State & local** | **3,497** | **3.2** | **25,943** | **4.4** | **3.0** |
| **Industry** | **12,609** | **11.7** | **94,419** | **8.7** | **11.1** |
| **Institutional** | **16,012** | **14.8** | **127,058** | **10.0** | **14.9** |
| **Other** | **5,618** | **5.2** | **51,807** | **2.7** | **6.1** |
| **Total** | **107,991** | **100.0** | **851,873** | **9.4** | **100.0** |
| Texas | | | | | |
| Federal | 71,914 | 53.2 | 560,870 | 10.1 | 49.9 |
| State & local | 14,112 | 10.4 | 126,438 | 5.3 | 11.2 |
| Industry | 11,315 | 8.4 | 79,383 | 14.6 | 7.1 |
| Institutional | 23,261 | 17.2 | 223,739 | 4.9 | 19.9 |
| Other | 14,478 | 10.7 | 133,929 | 5.1 | 11.9 |
| Total | 135,080 | 100.0 | 1,124,360 | 8.1 | 100.0 |
| U.S. total | | | | | |
| Federal | 1,199,644 | 58.4 | 9,721,778 | 8.4 | 59.4 |
| State & local | 153,414 | 7.5 | 1,273,607 | 7.3 | 7.8 |
| Industry | 149,734 | 7.3 | 1,126,638 | 11.0 | 6.9 |
| Institutional | 402,057 | 19.6 | 3,048,568 | 10.6 | 18.6 |
| Other | 147,834 | 7.2 | 1,193,743 | 9.1 | 7.3 |
| Total | 2,052,683 | 100.0 | 16,364,334 | 8.9 | 100.0 |

SOURCE: Estimations--National Science Foundation, National Science Board, *Science & Engineering Indicators--1998*. Appendix tables 4-3, 4-7, 4-11, 4-15; Data--National Science Foundation/SRS, *Survey of Research and Development Expenditures at Universities and Colleges, Fiscal Years 1996-1998*.

**FIGURE 2**
**STATE & LOCAL SUPPORT**
**FOR ACADEMIC RESEARCH***




*Percent of academic research expenditures made from state and local funding sources vs. federal funding sources for 1998.

SOURCE: National Science Foundation/SRS, Survey of Research and Development Expenditures at Universities and Colleges, Fiscal Year 1998.

Several other measures of the level of academic development are also available for Pennsylvania. For the past seven years, the Association of University Technology Managers (AUTM) has annually surveyed selected biomedical research institutions throughout the U.S. (and Canada), gathering data on several important process variables and outcomes of technology transfers from academic and other research institutions to private sector companies. Pennsylvania's institutions have been included in these surveys.

Invention disclosures and U.S. patents are two important *process variables* in biomedical product development. Invention disclosures received by Pennsylvania institutions during 1998 and the years 1991 to 1998 are given in table 11 (page 28).

Table 11

PENNSYLVANIA BIOMEDICAL RESEARCH INSTITUTIONS
Invention Disclosures Received
1998 and 1991 to 1998

| Institution | 1998 | 1991 to 1998 |
|---|---|---|
| Albert Einstein Healthcare Network | nd | 28 |
| Allegheny University of the Health Sciences | 48 | 133 |
| Carnegie Mellon University | 82 | 464 |
| Children's Hospital of Philadelphia | 8 | 104 |
| Drexel University | nd | 17 |
| Fox Chase Cancer Center | 9 | 93 |
| Hahnemann University | nd | 73 |
| Lehigh University | 6 | 88 |
| Medical College of Pennsylvania | nd | 15 |
| Pennsylvania State University | 190 | 1,088 |
| Temple University | 34 | 219 |
| Thomas Jefferson University | 76 | 536 |
| University of Pennsylvania | 233 | 1,120 |
| University of Pittsburgh | 74 | 290 |
| Wistar Institute | 15 | 53 |

nd. No data.

SOURCE: Association of University Technology Managers, Inc., *AUTM Licensing Survey: Fiscal Year 1998* and other years.

Table 11 shows that invention disclosures have been received primarily by academic institutions, but are also received by hospitals and other research institutions in the Commonwealth.

United States patents--total applications filed, new applications filed, and patents issued--for Pennsylvania institutions during 1998 and the years 1991 to 1998 are detailed in table 12 (page 29).

Table 12

PENNSYLVANIA BIOMEDICAL RESEARCH INSTITUTIONS
U.S. Patents: Total Applications Filed, New Applications Filed, and Patents Issued
1998 and 1991 to 1998

| Institution | 1998 | | | 1991 to 1998 | | |
|---|---|---|---|---|---|---|
| | Total applications filed | New applications filed | Issued | Total applications filed | New applications filed | Issued |
| Albert Einstein Healthcare Network | nd | nd | nd | 7 | 7 | 1 |
| Allegheny University of the Health Sciences | 29 | 25 | 5 | 62 | 49 | 15 |
| Carnegie Mellon University | 43 | 17 | 14 | 133 | 83 | 43 |
| Children's Hospital of Philadelphia | 10 | 3 | 1 | 69 | 49 | 22 |
| Drexel University | nd | nd | nd | 9 | 4 | 7 |
| Fox Chase Cancer Center | 12 | 7 | 3 | 65 | 33 | 15 |
| Hahnemann University | nd | nd | nd | 50 | 21 | 8 |
| Lehigh University | 13 | 5 | 6 | 68 | 38 | 25 |
| Medical College of Pennsylvania | nd | nd | nd | 6 | 6 | 2 |
| Pennsylvania State University | 173 | 122 | 25 | 596 | 487 | 115 |
| Temple University | 14 | 12 | 8 | 111 | 79 | 44 |
| Thomas Jefferson University | 67 | 38 | 34 | 433 | 275 | 119 |
| University of Pennsylvania | 172 | 97 | 57 | 672 | 493 | 259 |
| University of Pittsburgh | 46 | 25 | 14 | 231 | 104 | 75 |
| Wistar Institute | 17 | 11 | 15 | 86 | 40 | 32 |

nd. No data.

SOURCE:, Association of University Technology Managers, Inc., *AUTM Licensing Survey: Fiscal Year 1998.*

License revenue of the research institutions is the key *outcome* to the transfer of biomedical technology. The numbers of licenses and options executed and yielding revenue and the gross license revenue received for 1998 and the years 1991 to 1998 are given in table 13 (page 30).

Data for all institutions on the processes and outcomes of biomedical technology transfers are not available; therefore, comparisons of Pennsylvania to the selected states would be meaningless. Moreover, because biomedical product development data are available for only a sample of the total academic and other institutions involved, and because there can be long and variable lags between basic research and product development, no overall correlations can be made between the basic research expenditure data above and these product development data. Measuring the level of product development in

Table 13

PENNSYLVANIA BIOMEDICAL RESEARCH INSTITUTIONS
Licenses and Options Executed and Yielding License Revenue,
Gross License Revenue Received
1998 and 1991 to 1998
(Dollars in thousands)

| Institution | 1998 | | | 1991 to 1998 | | |
|---|---|---|---|---|---|---|
| | Licenses and options executed | Licenses and options yielding license revenue | Gross license revenue received | Licenses and options executed | Licenses and options yielding license revenue | Gross license revenue received |
| Albert Einstein Healthcare Network | nd | nd | nd | 3 | 1 | $3 |
| Allegheny University of the Health Sciences | 12 | 5 | $208 | 25 | 23 | 343 |
| Carnegie Mellon University | 11 | 20 | 30,065 | 74 | 102 | 54,075 |
| Children's Hospital of Philadelphia | 4 | 7 | 146 | 12 | 22 | 1,125 |
| Drexel University | nd | nd | nd | 6 | 12 | 134 |
| Fox Chase Cancer Center | 6 | 13 | 495 | 22 | 53 | 1,415 |
| Hahnemann University | nd | nd | nd | 23 | 26 | 320 |
| Lehigh University | 3 | 7 | 106 | 11 | 29 | 558 |
| Medical College of Pennsylvania | nd | nd | nd | 0 | 0 | 0 |
| Pennsylvania State University | 42 | 68 | 2,013 | 220 | 374 | 6,921 |
| Temple University | 10 | 12 | 826 | 64 | 120 | 4,462 |
| Thomas Jefferson University | 15 | 20 | 798 | 110 | 160 | 3,820 |
| University of Pennsylvania | 72 | 69 | 7,247 | 249 | 313 | 15,085 |
| University of Pittsburgh | 20 | 34 | 2,560 | 72 | 153 | 6,774 |
| Wistar Institute | 20 | 51 | 2,437 | 62 | 165 | 15,226 |

nd. No data.

SOURCE: Association of University Technology Managers, Inc., *AUTM Licensing Survey: Fiscal Year 1998.*

biomedical research in Pennsylvania using the AUTM survey data suggests that innovative and basic research *can* lead to significant outcomes from the transfer of technology from academic and other research institutions to private companies. However, the AUTM data also suggest that these outcomes are not all that they could be: there appears to be a considerable "disconnect" in the transfer phase of the process. This gap, between ideas and products, is discussed in the following section.

## THE IMPORTANCE OF THE BIOMEDICAL INDUSTRY IN PENNSYLVANIA

Research and development expenditures by the academic institutions in Pennsylvania totaled $1.3 billion in 1998 (see Tables 2, 9 and 10). The numbers and payrolls of employees engaged in R&D in these institutions are not readily available. Both are substantial.

Tripp, Umbach & Associates estimated the economic multiplier for the expenditures of Pennsylvania's academic health centers (AHC) to be 2.3 in a recent year.[16] This multiplier applies to the direct spending of seven groups within the AHC; spending for research and development was not singled out in any of these groups. Some of the spending included in the AHC multiplier does not apply to institutions that do not have medical schools. The multiplier would have to be updated for 1998. Nevertheless, this estimate is in line with another estimate of the economic impact multiplier for biomedical research spending.[17] This multiplier is sufficient to provide a very rough estimate of the economic impact of academic biomedical research spending in Pennsylvania in 1998. However, further study of the economic multiplier for biomedical research in Pennsylvania should be considered.

If the multiplier of 2.3 is applied to the $1.3 billion in R&D expenditures made by Pennsylvania's academic institutions in 1998, the economic impact is about $3.1 billion. This estimate includes the direct R&D expenditures of the academic institutions and the induced spending caused by the direct expenditures. By any reasonable measure the economic impact of academic biomedical research is substantial in the Commonwealth.

In 1998, 883 private biomedical establishments[18] in Pennsylvania employed 41,174 persons, with an annual payroll of $1.8 billion. Pharmaceutical companies were the largest employers, with 8,541 employees and an annual payroll of $590.2 million. Biomedical establishments added $9.7 billion in manufacturing value; the total value of their total biomedical shipments was $15 billion. Of this total, pharmaceutical companies added $6.6 billion in manufacturing value; the total value of their pharmaceutical shipments was $10.0 billion.[19]

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[16]Tripp, Umbach & Associates, Inc., *The Impact of Academic Health Centers on the Commonwealth of Pennsyvlania* (Pittsburgh, January 1995).

[17]Sclar Associates, for the Council on Biomedical Research & Development, *Biomedical Research & the New York State Economy* (New York, NY, March 2000). A multiplier of 1.67 was estimated in this report.

[18]Gin Hayden, "The High Technology Climate in Colorado," *Colorado Business Review,* Vol. LXV, No. 4 (July 1999). This article defines the biomedical industry.

[19]U.S. Census Bureau, "1998 County Business Patterns" and "1997 Economic Census."

The biomedical industry stands behind a very large health care industry in the Commonwealth. In 1998, 31,307 health care establishments in Pennsylvania employed 740,333 persons; their total payroll was $21.0 billion. Hospitals and physician offices were the largest employers, with 254,566 and 79,407 employees, respectively. Health services amounted to about 7.4 percent of Pennsylvania's gross state product. Health care institutions employed about 15 percent of the total employees in the Commonwealth; their payrolls were about 14 percent of the total payrolls in the Commonwealth. The health care industry is relatively labor intensive.[20]

Government research investments are estimated to provide a total return on investment of 28 percent, a very high rate of return.[21]

By these measurements, the biomedical industry is extremely important to Pennsylvania's economy. Using any reasonable value for the economic multiplier, spending on biomedical research produces a very large effect on total spending in the Commonwealth. Investments in biomedical research provide a very high rate of economic return. The economic impact of biomedical research will be further intensified if the strategic policy recommendations of the working group detailed in section III are implemented.

[20] *Ibid*.

[21] Edwin Mansfield, "Academic Research and Industrial Innovation," *Research Policy* 20: 1-12 (1991).

# II. THE STRENGTHS AND WEAKNESSES OF BIOMEDICAL RESEARCH IN PENNSYLVANIA

The biomedical research and development industry in Pennsylvania is vitally important to all segments of the Commonwealth. Biomedical research has had a very large impact on almost every part of both the public and private sectors. The industry's products and processes contribute greatly to a healthy and productive citizenry and workforce. These outputs and the persons producing them substantially impact the Commonwealth's economy. Biotechnology, along with information science, promises to be a leading growth industry in Pennsylvania in the coming decades.

The model of biomedical research and development, the institutions that perform and fund this research, and the data that illustrate the scale of major parts of the biomedical research process--which were presented in section I--can be used to illustrate the strengths and weaknesses of biomedical research in the Commonwealth.

## STRENGTHS

The strengths of biomedical research in Pennsylvania primarily involve institutions and basic research.

Institutions--Pennsylvania has a large number of highly acclaimed medical centers. The medical center at the University of Pennsylvania is the nation's oldest. Substantial biomedical discoveries have been made at the medical center of the University of Pittsburgh and the other medical centers in the Commonwealth. In 1999, the medical centers at the University of Pennsylvania and the University of Pittsburgh were both ranked in the top ten in NIH funding for the United States.

Other Pennsylvania institutions, including the institutions without medical centers, have also made important contributions to biomedical research. The rich diversity of institutions--medical schools, public and private academic institutions, independent hospitals, foundations and private biotechnology and pharmaceutical companies--is the primary source of strength in biomedical research in the Commonwealth.

Basic research--Pennsylvania's biomedical research institutions are very highly regarded. One measure of proof comes from viewing NIH awards. NIH awards are made using a peer-review process. Competing grants are awarded by NIH study groups composed of objective, biomedical research experts. As shown in section I, Pennsylvania's institutions have successfully obtained NIH awards for basic biomedical research. This success in funding is testimony that basic research is performed well in Pennsylvania. The success in obtaining NIH funding also demonstrates the fact that the Commonwealth has a substantial base of private companies that can handle the transfer of biomedical technology from academic and other research institutions. Without this base, the biomedical research process would surely not work as well as it does.

Basic biomedical research in Pennsylvania's academic and other research institutions, supported by private biomedical companies, is very strong and attracts significant federal funding. Present plans call for the continuation of the substantial increases in the NIH funding of basic research that have been experienced in the recent past. With its well-regarded institutions, Pennsylvania should continue to receive a large share. But future support is never certain.

## WEAKNESSES

Biomedical research in Pennsylvania, strong and vibrant, ranks among the best in the world. Nevertheless, certain weaknesses exist. These weaknesses, systemic in nature, are extremely important. The weaknesses need to be addressed in order to maintain and build upon the Commonwealth's considerable strengths and to meet the strong competition of other states.

Three major problem areas are identified: the erosion of research infrastructure; insufficient venture capital for technology transfers from academic and other research institutions to the private sector; and the lack of a mechanism for promoting and coordinating biomedical research and forming regional specializations.

**The erosion of research infrastructure.** The academic biomedical research infrastructure in Pennsylvania is highly acclaimed. An institution must have a substantial infrastructure in place in order for its researchers to apply for and fully use external funding. The considerable past successes that Pennsylvania researchers have had in attracting federal and other funding is strong evidence that the infrastructure in the Commonwealth's institutions is considerable.

However, recent developments are putting strains on several important parts of the academic biomedical research infrastructure. These strains will cause the infrastructure to erode if they are not dealt with in a timely and comprehensive manner.

*The decline of institutional revenues available for research*. There is a well-documented problem facing all academic medical centers (and community hospitals) throughout the United States.[22] A set of factors is resulting in the reduction of revenues previously available to pay for research. These factors include the increased penetration of managed care organizations with payment capitations for patient care; recent changes in Medicare and Medicaid with reimbursement limits for Medicare and Medicaid patients; and the increased incidence of uncompensated patient care with its huge impact on hospital revenues. The reductions in revenues have threatened the financial viability of most hospitals, including those in Pennsylvania.

The amount of some of the reductions is difficult to measure. The impacts of these factors on research can only be inferred from data that shows the extent of the factors in the Commonwealth as compared to other states.

The penetration of managed care organizations, have curtailed all hospital revenues. Table 14 (page 36) presents penetration rates for capitated enrollment in health maintenance organizations (HMOs) in Pennsylvania and the six selected states for 1998.

[22]See for example, Commonwealth Fund Task Force on Academic Health Centers, *From Bench to Bedside: Preserving the Research Mission of Academic Health Centers* (New York, NY, April 1999); Stephen J. Heinig, Andrew S. W. Quon, Roger E. Meyer and David Korn, "The Changing Landscape for Clinical Research," *Academic Medicine*, Vol. 74 No. 6 (June 1999).

Table 14

HMO PENETRATION BY STATE
FOR PENNSYLVANIA AND SELECTED OTHER STATES
Fiscal Year 1998

| State | State population (000) | HMO enrollment | HMO penetration rate | HMO Medicare penetration rate |
|---|---|---|---|---|
| California | 32,667 | 25,678,813 | 78.6% | 40.0% |
| Illinois | 12,045 | 1,007,315 | 8.4 | 10.3 |
| Massachusetts | 6,147 | 2,690,117 | 43.8 | 23.5 |
| New York | 18,175 | 6,210,299 | 34.2 | 17.3 |
| Ohio | 11,209 | 2,323,008 | 20.7 | 16.3 |
| **Pennsylvania** | **12,001** | **3,895,818** | **32.5** | **25.6** |
| Texas | 19,760 | 3,297,792 | 16.7 | 15.7 |
| U.S. total | 270,299 | 84,130,471 | 31.1 | 16.7 |

SOURCE: HCIA, *Guide to the Managed Care Industry, 2000 Edition*, and Health Care Financing Administration, *HCFA Market Penetration Report*, 12/31/98.

Table 14 shows that Pennsylvania ranks fourth in HMO penetration for the general population, behind California, Massachusetts and New York; HMO penetration in the Commonwealth also exceeds the U.S. average. In fact, when HMO enrollment for gatekeeper preferred provider organizations is included, Pennsylvania's total managed care penetration rate increased to 43.2 percent in 1998. For Medicare recipients who select HMO coverage rather than fee-for-service coverage, the Commonwealth ranks second behind only California; Medicare HMO penetration in Pennsylvania also well exceeds the U.S. average. These high HMO penetration rates have reduced hospital revenues in the Commonwealth. The revenue reduction is especially severe for Pennsylvania academic health centers, because HMO penetration rates for both the general population and Medicare recipients in both Philadelphia and Allegheny counties are much higher than the Commonwealth averages. Medicaid HMO penetration rates in these counties exceed Pennsylvania's average by even more than the Medicare penetration rates.

For Medicare and Medicaid patients alone, The Hospital & Healthsystem Association of Pennsylvania estimates that Commonwealth health care providers lost about $850 million in

revenues under managed care in 1998.[23] For non-Medicare and Medicaid patients, no similar estimate is available. However, the hospital revenue loss due to commercial managed care patients was also very large.

The Balanced Budget Act of 1997 (BBA) included changes to Medicare and Medicaid reimbursement policies.[24] These changes, which limit reimbursements for Medicare and Medicaid patients, have also served to greatly reduce the revenues of the academic medical centers. Table 15 shows the Medicare beneficiaries enrolled in Pennsylvania and the selected states for 1998.

Table 15

MEDICARE BENEFICIARIES ENROLLED
FOR PENNSYLVANIA AND SELECTED OTHER STATES
1998

| State | State population (000) | Medicare enrollment | | | Total Medicare enrollment rate |
|---|---|---|---|---|---|
| | | Aged | Disabled | Total | |
| California | 32,667 | 3,348,219 | 434,748 | 3,782,967 | 11.6% |
| Illinois | 12,045 | 1,439,534 | 186,379 | 1,625,913 | 13.5 |
| Massachusetts | 6,147 | 827,016 | 123,886 | 950,902 | 15.5 |
| New York | 18,175 | 2,320,366 | 345,920 | 2,666,286 | 14.7 |
| Ohio | 11,209 | 1,475,656 | 213,138 | 1,688,794 | 15.1 |
| **Pennsylvania** | **12,001** | **1,874,293** | **214,942** | **2,089,235** | **17.4** |
| Texas | 19,760 | 1,923,777 | 271,933 | 2,195,710 | 11.1 |
| U.S. total | 270,299 | 33,120,033 | 4,878,002 | 37,998,035 | 14.1 |

SOURCE: Health Care Financing Administration, *Medicare State Enrollment for 1998*.

Table 15 shows that Pennsylvania ranks highest in these states in the percent of the population that is enrolled in Medicare.

Table 16 (page 38) shows Medicaid recipients by basis of eligibility for these states for 1998. The Commonwealth ranks fourth in the percent of its population that receives Medicaid payments by all groups who are eligible, behind California, New York and Massachusetts.

[23]This estimate includes only revenue losses under Medicare and Medicaid managed care programs.

[24]The Balanced Budget Refinement Act of 1999 (BBRA) restored about 10 percent of the BBA cuts.

Table 16

MEDICAID RECIPIENTS BY BASIS OF ELIGIBILITY
FOR PENNSYLVANIA AND SELECTED OTHER STATES
1998

| State | State population (000) | Medicaid recipients | | | | | | | Total Medicaid recipient rate |
|---|---|---|---|---|---|---|---|---|---|
| | | Aged | Disabled | Children | Adults | Foster Children | Unknown | Total | |
| California | 32,667 | 587,326 | 926,252 | 3,345,491 | 1,646,576 | 138,609 | 437,921 | 7,082,175 | 21.7% |
| Illinois | 12,045 | 108,132 | 262,773 | 620,251 | 293,879 | 78,821 | -- | 1,363,856 | 11.3 |
| Massachusetts | 6,147 | 113,876 | 197,426 | 409,962 | 186,362 | 612 | -- | 908,238 | 14.8 |
| New York | 18,175 | 393,567 | 592,598 | 1,315,777 | 689,543 | 81,756 | -- | 3,073,241 | 16.9 |
| Ohio | 11,209 | 168,246 | 232,986 | 586,546 | 278,603 | 24,395 | -- | 1,290,776 | 11.5 |
| **Pennsylvania** | **12,001** | **222,458** | **272,083** | **745,977** | **257,602** | **23,026** | **1,974** | **1,523,120** | **12.7** |
| Texas | 19,760 | 301,368 | 288,293 | 1,327,276 | 391,786 | 16,087 | -- | 2,324,810 | 11.8 |
| U.S. total | 270,299 | 3,962,707 | 6,636,772 | 18,297,721 | 7,902,319 | 654,684 | 2,211,500 | 39,665,703 | 14.7 |

SOURCE: Health Care Financing Administration, *Medicaid Recipients by Basis of Eligibility, 1998*.

As noted above, Pennsylvania's urban areas have higher concentrations of Medicare and Medicaid recipients than rural areas of the Commonwealth.

The Hospital & Healthsystem Association of Pennsylvania estimates that Commonwealth health care providers lost about $425 million in revenues under the BBA in 1998. Since the revenue losses to providers under this act are "back loaded" (due to accumulation effects), however, the largest losses are yet to come. By 2002, the revenue loss to providers is estimated to be $1.148 billion, offset by about $83.7 million restored under the BBRA.[25] Because of the high concentrations of Medicare and Medicaid patients in Pennsylvania's urban areas, a disproportionably high share of these losses are borne by the academic medical centers.

Finally, the revenues of health care providers are adversely impacted by the considerable costs of treating an increasing number of charity patients (who hospitals determine at time of service cannot pay for services either through insurance coverage or their own resources), and for assuming larger amounts of the bad debts of patients (who hospitals expected to pay but who ultimately cannot pay all or a part of their bills). Comparable state data on uncompensated patient care are particularly difficult to come by.[26] The uncompensated care

[25]The Hospital & Healthsystem Association of Pennsylvania, "Pennsylvania Medicare Revenue Decreases by BBA Year" and "BBA Relief Package 2000-2004, Estimated Impact on Pennsylvania Hospitals," 12/9/99.

[26]For charity cases, some states record hospital treatment costs, while others record hospital patient charges.

problem is particularly acute for the academic medical centers that serve the urban areas of the Commonwealth.

The Pennsylvania Health Care Cost Containment Council has determined that the amount of uncompensated care (charity and bad debt care) provided to the patients of Pennsylvania's general acute care hospitals during fiscal year 1998 totaled $759 million, amounting to about 4.5 percent of net patient revenues. For many academic medical centers, especially those in some parts of Philadelphia, the portion of net patient revenues lost due to uncompensated patient care is even higher.[27]

The academic medical centers are especially affected by these three factors for several reasons. Their patient costs must include the costs of teaching, as well as the pure research conducted in their laboratories and the patient-oriented research conducted in their clinics.[28] They often receive the most difficult and expensive-to-treat cases. Finally, because most medical centers are located in urban areas, they are particularly affected by the factors that tend to lessen reimbursements in these areas. In turn, the loss of revenues in the academic medical centers directly affects biomedical research, because institutional revenues are used in all stages of the biomedical research and development process. As was shown in the model of biomedical research above, nearly all of the beginning stage of biomedical research, innovation research, is funded by institutional investment. This research precedes the basic research that is funded by NIH and other external funding sources. It is, therefore, the fundamental stage in the biomedical R&D process. In addition, institutional funds supplement external research funds in all of the other stages of the research process in which they are involved, subsequent to innovation research. Without the funding expended by the institutions at the beginning of the R&D process, the institutions cannot attract external funding. And without the funding added by the institutions in the later stages of the process, the external research funding at the later stages cannot be used effectively, if at all.

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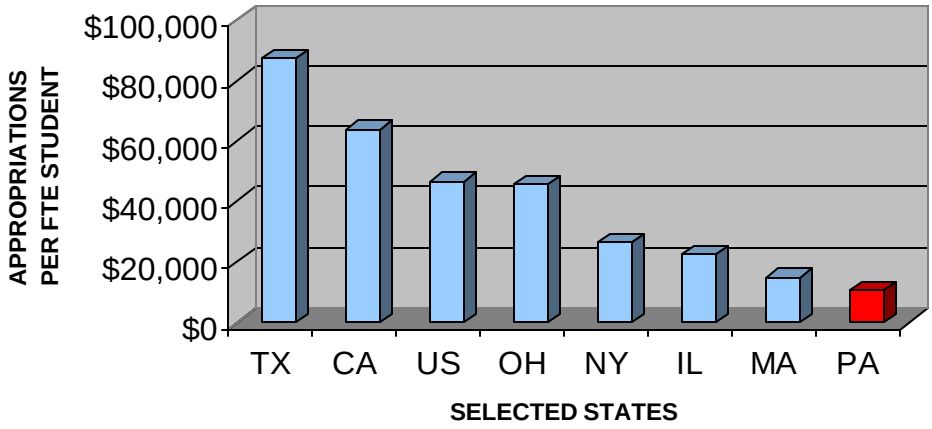
[27]Unlike most other states, Pennsylvania has no *public* acute care general hospitals. In fact, Philadelphia is the largest city in the nation without a public hospital. Nearly half of the Commonwealth's uncompensated care burden is borne by hospitals in southeastern Pennsylvania.

[28]Tripp, Umbach & Associates, Inc., *ibid.* (p. 5), estimate that patients costs in academic health centers are about 20 percent higher than costs in nonacademic health care hospitals.

The revenue problem for medical schools in Pennsylvania is exacerbated by the low appropriations these schools receive from the Commonwealth, on a per medical student basis, compared to the state appropriations received by the medical schools in the selected states and the U.S. average. For 1997-98, state appropriations per full-time equivalent (FTE) medical student in these states were: $87,497 in Texas; $63,924 in California; $45,886 in Ohio; $26,463 in New York; $22,883 in Illinois; $15,142 in Massachusetts; and $10,583 in Pennsylvania. The average state appropriation per FTE medical student in the U.S. was $46,743. These state rankings are portrayed in figure 3. The low state appropriations to Pennsylvania medical schools have a detrimental effect on academic biomedical research. With low appropriations, the medical schools must use more of their own institutional funds for teaching and have less of these funds available for research.

**FIGURE 3**
**STATE SUPPORT**
**FOR MEDICAL STUDENTS***




*State appropriation per FTE medical student for 1997-98.

SOURCE: Data provided by the Institutional Profile System, Association of American Medical Colleges, Washington, DC, August 2000.

*The decline in physician-scientists*. There is another well-known problem facing the academic medical centers nationally.[29] Several factors--the recent, large debt load of graduating medical school students and the effect of the debt on careers in research, is one key factor--are causing a decline in the number of physician-scientists. Physician-scientists are an essential part of the academic biomedical research infrastructure. They are one of the academic institution's central contributions to the academic institution-private company partnership in the biomedical research process. Patients may only be treated by licensed physicians. Physician-scientists enhance the R&D process flow, from ideas to products and processes to patients, from bench to bedside. In both the innovation research and clinical trial stages of the process, physician-scientists synthesize the science of medicine with the art of research. Without physician-scientists to formulate ideas and apply them to patients, the biomedical R&D process cannot function clinically.

With its outstanding academic biomedical research institutions, Pennsylvania has been able to attract some of the best physician-scientists. By their work and reputations, these researchers are able to attract considerable external funding and serve as a training ground for the next generation of physician-scientists. They are also able to attract other researchers for their projects.

Measurements of the number of physician-scientists can only be made indirectly. One such measure utilizes NIH awards made to M.D.s and M.D./Ph.D.s for research training. NIH awards are frequently used by physicians and others for the further training required for research careers. The NIH makes various kinds of awards to assist persons in pursuing research as their specialty.

National Research Service Awards are the major awards made by NIH for research training for physicians and others. Table 17a (page 42) details these awards made to M.D.s and

[29]See for example, Tamara R. Zemlo, Howard H. Garrison, Nicola C. Partridge, and Timothy J. Ley, "The Physician-Scientist: Career Issues and Challenges at the Year 2000," *The FASEB Journal,* Vol. 14 (Bethesda, MD, February 2000): Leon E. Rosenberg, "Physician-Scientists Endangered and Essential," *Science,* Vol. 283 (January 1999).

Table 17a

NIH NATIONAL RESEARCH SERVICE AWARDS
TO M.D. AND M.D./PH.D.s
FOR PENNSYLVANIA AND SELECTED OTHER STATES
1989 TO 1998

| State | Applications | Awards | Awards: Success rate | Awards: Growth rate | Awards: Share of U.S. total |
|---|---|---|---|---|---|
| California | 845 | 407 | 48.2% | -0.5% | 14.0% |
| Illinois | 172 | 82 | 47.7 | 0.0 | 2.8 |
| Massachusetts | 813 | 421 | 51.8 | 0.6 | 14.4 |
| New York | 502 | 249 | 49.6 | -4.0 | 8.5 |
| Ohio | 138 | 67 | 48.6 | 8.3 | 2.3 |
| **Pennsylvania** | **482** | **230** | **47.7** | **-2.0** | **7.9** |
| Texas | 222 | 106 | 47.7 | 12.7 | 3.6 |
| U.S. total | 5,951 | 2,914 | 49.0 | 0.1 | 100.0 |

SOURCE: Data provided by the Office of Reports and Analysis, Office of Extramural Research, National Institutes of Health, Bethesda, MD, April 2000.

M.D./Ph.D.s, both postdoctoral individuals and institutions in Pennsylvania and the six selected states, for 1989 to 1998; table 17b (page 43) shows the same awards made to Ph.D.s only.

Table 17a shows that the National Research Service Awards made to physicians actually declined in Pennsylvania, while table 17b (page 43) shows that the awards to nonphysicians grew at a rate more than three times higher than the U.S. average during the last ten years. Since NIH approval rates for grant applications from both individuals and institutions in the Commonwealth were approximately the same as the national averages, applications from Pennsylvania physicians for these awards must have grown more slowly, and from Pennsylvania nonphysicians much faster, than the national averages. Awards to physicians relative to nonphysician are declining.

Table 17b

NIH NATIONAL RESEARCH SERVICE AWARDS
TO Ph.D.s
FOR PENNSYLVANIA AND SELECTED OTHER STATES
1989 TO 1998

| State | Applications | Awards | Awards: Success rate | Awards: Growth rate | Awards: Share of U.S. total |
|---|---|---|---|---|---|
| California | 4,309 | 1,764 | 40.9% | 2.1% | 19.3% |
| Illinois | 712 | 306 | 43.0 | 3.4 | 3.3 |
| Massachusetts | 2,689 | 1,154 | 42.9 | 5.9 | 12.6 |
| New York | 1,835 | 759 | 41.4 | 4.4 | 8.3 |
| Ohio | 445 | 170 | 38.2 | 11.1 | 1.9 |
| **Pennsylvania** | **1,136** | **474** | **41.7** | **17.9** | **5.2** |
| Texas | 1,059 | 442 | 41.7 | 6.5 | 4.8 |
| U.S. total | 21,963 | 9,148 | 41.7 | 5.0 | 100.0 |

SOURCE: Data provided by the Office of Reports and Analysis, Office of Extramural Research, National Institutes of Health, Bethesda, MD, April 2000.

Research Career Awards are another group of awards made by NIH for research training, although these awards are much less in number than the National Research Service Awards. Table 18a (page 44) shows these awards made to M.D.s and M.D./Ph.D.s in Pennsylvania and the six selected states for 1989 to 1998; table 18b (page 44) shows the same awards made to Ph.D.s only.

Table 18a (page 44) shows that NIH Research Career Awards to physicians in Pennsylvania grew somewhat faster than the U.S. total. These awards, however, are rather small in number.

Table 18a

NIH NATIONAL RESEARCH CAREER AWARDS
TO M.D. and M.D./Ph.D.s
FOR PENNSYLVANIA AND SELECTED OTHER STATES
1989 TO 1998

| State | Applications | Awards | Awards: Success rate | Awards: Growth rate | Awards: Share of U.S. total |
|---|---|---|---|---|---|
| California | 436 | 233 | 53.4% | 54.0% | 12.0% |
| Illinois | 113 | 50 | 44.2 | 33.3 | 2.6 |
| Massachusetts | 570 | 398 | 69.8 | 14.4 | 20.5 |
| New York | 340 | 153 | 45.0 | 15.6 | 7.9 |
| Ohio | 101 | 50 | 49.5 | 18.5 | 2.6 |
| **Pennsylvania** | **276** | **147** | **53.3** | **26.7** | **7.6** |
| Texas | 157 | 71 | 45.2 | 25.9 | 3.7 |
| U.S. total | 3,657 | 1,939 | 53.0 | 22.1 | 100.0 |

SOURCE: Data provided by the Office of Reports and Analysis, Office of Extramural Research, National Institutes of Health, Bethesda, MD, April 2000.

Table 18b

NIH NATIONAL RESEARCH CAREER AWARDS
TO Ph.D.s
FOR PENNSYLVANIA AND SELECTED OTHER STATES
1989 TO 1998

| State | Applications | Awards | Awards: Success rate | Awards: Growth rate | Awards: Share of U.S. total |
|---|---|---|---|---|---|
| California | 41 | 22 | 53.7% | -- | 18.2% |
| Illinois | 8 | 3 | 37.5 | -- | 2.5 |
| Massachusetts | 47 | 25 | 53.2 | -- | 20.7 |
| New York | 23 | 12 | 52.2 | 55.6% | 9.9 |
| Ohio | 6 | 4 | 66.7 | -- | 3.3 |
| **Pennsylvania** | **12** | **6** | **50.0** | **--** | **5.0** |
| Texas | 16 | 5 | 31.3 | 11.1 | 4.1 |
| U.S. total | 239 | 121 | 50.6 | 103.7 | 100.0 |

SOURCE: Data provided by the Office of Reports and Analysis, Office of Extramural Research, National Institutes of Health, Bethesda, MD, April 2000.

The decline in physician-scientists in Pennsylvania, as measured by the NIH awards to physicians for research training and careers, is at least partially related to the large debt load of medical school graduates in the Commonwealth. Table 19 shows the average debt load for students graduating from Pennsylvania medical schools and the medical schools of the six selected states for 1998.

Table 19 shows that Pennsylvania ranks second to only Illinois in the average debt per graduating medical school student among the states in this list. More importantly, Pennsylvania ranks first among these states in the percent of graduating students with a debt load equal to or greater than $100,000.

Table 19

GRADUATING MEDICAL SCHOOL STUDENT DEBT[1]
FOR PENNSYLVANIA AND SELECTED OTHER STATES
1998

| State | Number of graduating medical school students | Average student debt | Percentage of students with debt greater than $100,000 |
|---|---|---|---|
| California | 836 | $63,444 | 21.8% |
| Illinois | 843 | 86,157 | 44.2 |
| Massachusetts | 478 | 79,112 | 37.3 |
| New York | 1,338 | 71,180 | 31.8 |
| Ohio | 555 | 65,435 | 26.6 |
| **Pennsylvania** | **892** | **84,786** | **50.7** |
| Texas | 867 | 58,352 | 12.0 |

1. Debt is self-reported to AAMC by the graduating medical students on the Graduate Questionnaire.

SOURCE: Data provided by the Association of American Medical Colleges, April 2000.

Table 20 (page 46) shows the relationship between the expected career choices and debt of graduating medical school students in Pennsylvania for 1998.

Table 20

PENNSYLVANIA GRADUATING
MEDICAL SCHOOL STUDENTS EXPECTED
CAREERS RELATED TO MEDICAL SCHOOL DEBT[1]
1998

| Expected career | Percentage of students with debt less than $100,000 | Percentage of students with debt greater than $100,000 |
|---|---|---|
| Research | 55.6% | 44.4% |
| Nonresearch | 45.8 | 54.2 |

1. Debt is self-reported to AAMC by the graduating medical students on the Graduate Questionnaire.

SOURCE: Data provided by the Association of American Medical Colleges, Washington, DC, April 2000.

Table 20 shows that, according to students graduating from Pennsylvania medical schools and responding to the Graduate Questionnaire of the Association of American Medical Colleges, 55.6 percent of the graduates expecting to enter research careers had a debt load of less than $100,000; only 44.4 percent of the graduates expecting to enter research careers had a debt load greater than $100,000. The opposite proportions apply to the Pennsylvania respondents who expect to pursue nonresearch careers.

Clearly, by the measures employed, there has been a decline of physician-scientists in Pennsylvania over the last decade. Evidently, the debt load of graduating medical school students--especially the large incidence of very high debt load--is an important factor in the formulation of their career intentions, as well as their ultimate choice of research careers.

*The decline in the condition of research buildings, laboratories, equipment, etc.* Finally, there is one more national problem facing the academic biomedical research centers.[30] Insufficient funding for research facilities is causing a decline in the condition of this important part of the biomedical research infrastructure. In this study, infrastructure is defined broadly to include people, facilities and funding. Facilities--buildings, laboratories, equipment, etc.--are an essential part of the academic biomedical research infrastructure. A stock of research facilities must be in place to attract external funding. The lack of adequate facilities can doom funding opportunities. In the academic biomedical research environment, facilities extend throughout the whole biomedical research process.

Research space averaged nearly 139,000 square feet in the 16 Pennsylvania academic institutions responding to a 2000 survey of research institutions conducted by the NSF.[31] Although the average research space in the Pennsylvania academic institutions that responded to the survey is smaller than the average research space in the responding institutions in all but one of the other states (Ohio) being compared to Pennsylvania, academic research facilities in Pennsylvania are quite formidable. The Commonwealth could not attract the external research funding it does without these facilities.

However, the members of the working group believe that the condition of academic and other research facilities in Pennsylvania has eroded. New construction and the remodeling of existing buildings have not kept up with needs. Laboratory space is not available for all existing projects, let alone new ones. Equipment has become outdated in many instances.

This conclusion is substantiated in the survey results reported by the NSF. Only 47 percent of the research space used for the Biological Sciences in Pennsylvania and 39 percent of the research space used for the Medical Sciences were reported to be "suitable for the most scientifically competitive research" by the institutions that responded to the survey. Furthermore, in the responding institutions only 38 percent of the research space used for the Biological Sciences and 46 percent of the research space used for the Medical Sciences were reported to be "suitable for most levels of research." Most importantly, 12 percent of the

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[30]Bruce Agnew, "Biomedical Research Institutions' Backlog of Deferred Lab Construction and Modernization Projects is Getting Worse, Says New Report," *Washington Fax* (October 1999).

[31]National Science Foundation, *Scientific and Engineering Research Facilities at Colleges and Universities* (Arlington, VA, 2000).

research space used for the Biological Sciences and 11 percent of the research space used for the Medical Sciences "require major repair or renovation." And 3 percent of the research space used for the Biological Sciences and 5 percent of the research space used for the Medical Sciences "require replacement." Pennsylvania is not unique in having problems with the condition of research space in its academic institutions--the states being compared to Pennsylvania report similar problems. This does not diminish the importance of this problem in the Commonwealth.

The erosion of academic research facilities has been caused by a lack of facilities funding. Federal government funding for research facilities--largely dispersed by the NIH--is relatively small.[32] State and local funding for research facilities has been virtually nonexistent. Institutional funds available for the construction and renovation of research facilities have been limited by the revenue-reducing factors described above. Since bond ratings for academic institutions depend in part on the extent and condition of existing facilities, deteriorating facilities can raise borrowing costs for new projects.

In 1998-99, Biology and Medical Science repair projects started in the Pennsylvania medical schools responding to the NSF survey involved a total of 181,000 square feet (at a cost of $26.8 million); Biology and Medical Science repair projects in the Arts and Sciences at the responding institutions involved a total of 175,000 square feet (at a cost of $18.6 million). There was no new construction in these two areas at the responding medical schools; new construction in the two areas in the Arts and Sciences at the responding institutions involved 78,000 square feet (at a cost of $34.1 million).

While these efforts are substantial, the working group feels that additional funding for the research facilities portion of infrastructure in the Commonwealth's academic institutions is necessary to prevent further deterioration.

**The erosion of research infrastructure--the decline in institutional revenues available for research; the decline in the number of physician-scientists; and the decline in the construction, rehabilitation and maintenance of research buildings, laboratories, equipment, etc.--is the most critical area of need for biomedical research in Pennsylvania.**

[32]Research grants do not generally pay for research facilities. Awards to 16 Pennsylvania institutions from the NIH National Center for Research Resources, the component of NIH that makes most construction and renovation grants, totaled $26.3 million in 1998. The University of Pennsylvania received 37.5 percent of the total.

The lack of institutional and other funding for infrastructure has extremely important consequences for the Commonwealth. First, the biomedical infrastructure is important in all stages of the biomedical R&D process. Second, the biomedical infrastructure is crucial to attracting funding for basic research, applied research, and development from all external sources. Third, with reduced institutional funding, more researchers are turning to private industry for financial support, risking private companies' pressure to report positive results.[33] The concentration of biomedical infrastructure is one of Pennsylvania's great strengths. This resource should not be permitted to erode.

**Insufficient funding for the transfer of technology from academic and other research institutions to companies in the private sector.** The progress from basic research to new diagnostic and therapeutic products is long, arduous and inevitably expensive. At the outset, academic medical centers, universities and other research institutions conceive new avenues for inquiry and generate substantial new knowledge regarding human biological processes; in the end, biotechnology and pharmaceutical companies refine manufacturing processes to transform the new technology into new products, manage regulatory reviews for marketing and reimbursement approvals, and deliver the products to clinical settings. Somewhere in the continuum from idea to application, inspiration gives way to operation, as focus shifts from basic to applied research and then to product development and delivery. While each segment of the continuum presents its own challenges, the area of transition from research to commercial development is a particular obstacle to both delivering new medical therapies and realizing the full economic and health benefits of the biomedical industry.

The process of technology refinement leading to new products available for clinical use does not occur within the research institutions themselves, nor is much of the cost of it underwritten by NIH or other governmental grants. Rather, NIH-funded basic research knowledge is delivered through a commercial product development effort that is funded mostly by private investment. Navigating the research-to-commercial transition presents peculiar challenges to research institutions and private companies and to the management of the connection between them. Looked at from either end, research institutions and companies find themselves extending beyond their core

[33]Catherine DeAngelis, Journal of the American Medical Association, as reported in *The Philadelphia Inquirer*, May 5, 2000, p. 5.

competencies to reach forward or backward to make contact with the other to hand off or to receive promising, new biomedical technology.

At the point of transfer of the new technology from the research institution to the company, the ultimate utility of the technology or the ability of the company to reduce it to a medical product is often far from certain. Biomedical companies, especially early-stage ones, are finding fewer institutional or private investors willing to accept the risk that a new technology may not generate a commercially viable product, especially when other investment opportunities that appear to promise less risk and faster returns abound. But as much as the companies cannot afford to function as research institutes, research institutions are not well equipped to carry forward technological development to commercialization. In other words, completing the transition from technology to product development is inconsistent with the university mission, broadly speaking, and difficult for emerging companies to finance.

The process of clinical testing to establish the safety and effectiveness of a new medical product to meet FDA marketing approval requirements can take years to complete and requires the expenditure of millions of dollars. Ironically, while the increased NIH funding of medical research is promising a coming Age of Biology, the biomedical companies engaged in bringing new products to market are finding their access to private and public financing is being restricted in favor of investments appearing to bring quicker returns. To the extent improved health care depends upon the translation of medical research into new products available for clinical use, the inability of biomedical companies to engage in or to accelerate product development will diminish or postpone much of the promise of basic research.

While there must be a clear link between federally funded research and commercially funded product development to achieve better health care, there is not necessarily a corresponding geographic link between the institutions performing research and the companies creating new products. Assuming efficient technology transfer efforts by Pennsylvania's research institutions, the knowledge generated by these institutions will find commercial ventures somewhere, and the medical products which result will eventually improve the health of Pennsylvania citizens. But if product development occurs in out-of-state companies, the economic benefits that could have been derived from commercial product development in Pennsylvania will be substantially diminished.

Enhanced and expanded basic research presents an opportunity for a greater volume of private investment in biotechnology in Pennsylvania, particularly with respect to early-stage companies. Co-located research and investment resources have a synergistic effect that can facilitate both local deployment of new medical technologies and economic expansion. To reach those goals, a commitment of Commonwealth funds would help catalyze a biotechnology investment strategy which recognizes that early-stage companies are high-risk ventures greatly in need of relatively small amounts of capital, while institutional investors have less daunting risk profiles and require predictable exit opportunities and the ability to invest in larger amounts simply to be able to effectively manage their portfolios.

Established Commonwealth programs like the Ben Franklin Partnership and the Pennsylvania 21 Initiative, while benefiting economic development in Pennsylvania in many ways, are not of sufficient size to be able to specifically target biotechnology companies beyond their earliest stages of development. The pre-clinical development stage of a new medical technology may require $2-5 million. Initial and intermediate testing in humans may consume $10 million or more. The Commonwealth should work with recognized institutional investors to organize a fund willing and able to support biomedical companies as their organizations and technologies mature. The union of a patient financial source--Commonwealth funds--with organized investment expertise could produce a meaningful capital pool less dependent on early liquidation of investments but still distributed on a rational basis.

At the same time, perhaps a more nuanced approach is required to align investor expectations with investment opportunities in biomedical research and expand both the pool of prospective investors as well as their investment vehicles. For example, a biomedical research venture capital fund could become the catalyst for regional or Commonwealth-wide private investor pledge funds that identify and screen qualified individuals in advance of specific seed or early-stage investment opportunities; these funds would accelerate access by biotechnology companies to the individual investors most likely to place relatively small amounts of money into higher-risk ventures.

Backed by the analytical and managerial expertise provided by the venture fund, the interplay between institutional and individual investors would provide for appropriately staged and coordinated investment cycles featuring the right investor for each stage. At the same time, the broad-based support for

biomedical innovation would spread the economic return among the citizens of the Commonwealth as widely as possible.

The second area of need for biomedical research in Pennsylvania is insufficient venture capital for technology transfers from research institutions to private sector companies--the disconnect between the basic research, applied research, and development stages of the biomedical research process.

The lack of public and private venture capital for technology transfers is devastating to the biomedical R&D process, primarily because the basic research stage prior to this stage is so well performed and funded. Indeed, insufficient venture capital might be causing very deserving projects coming out of the basic research stage to be less than fully exploited.

**The lack of a mechanism for promoting and coordinating biomedical research and forming regional specializations.** Pennsylvania presently lacks a mechanism for actively promoting biomedical research, coordinating the research efforts of research institutions and private sector companies, and providing an impetus for research institutions and private companies to form strong, regional specializations in biomedical research. This mechanism would provide space for start-up companies, and have permanent investigators and faculty ties to biomedical research programs. These functions could be provided through either a virtual institute, or bricks-and-mortar institutes located in various regions of the Commonwealth.

Together, the erosion of infrastructure, the lack of venture capital, and the lack of a mechanism for promoting and coordinating biomedical research and forming regional specializations are the three major weaknesses in biomedical research in Pennsylvania.

# III. STRATEGIC POLICIES TO AID BIOMEDICAL RESEARCH IN PENNSYLVANIA

## WHY STRATEGIC POLICY ACTIONS ARE NEEDED NOW

*The New York Times* called the deciphering of the human genome "an achievement that represents a pinnacle of human self-knowledge." At the press conference announcing the completion of the Human Genome Project by Celera Genomics and the National Human Genome Research Institute, President Clinton proclaimed that "[T]oday we are learning the language in which God created life."[34]

Understanding the human genome will revolutionize the practice of medicine. But it is far more important than even that. Beyond medicine, knowledge of the genetic code "will in time redefine knowledge of ourselves, our history, our innate capacities and our relationship to the rest of creation."[35] Not many other discoveries have been more important in our time or any other time.

In a relatively few years, advances in biomedical research have changed our understanding of the life sciences, opening the door to new ways to prevent, treat and cure disease. Improved therapies flowing from biomedical research have included better methods for treating and lowering the mortality rates for AIDS. New drugs and therapies have lowered death rates from heart attacks and strokes. New drugs and treatments have decreased the incidence and mortality rates of cancer. These and many, many other benefits have emanated from biomedical research.[36]

But the best may be yet to come. It is predicted that over the next five to ten years there is likely to be a profound acceleration in biomedical research, leading to untold benefits for the human condition. This era will be the Age of Biology. These are unique times.

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[34]Nicholas Wade, "Genetic Code of Human Life Is Cracked by Scientists," *The New York Times*, June 27, 2000.

[35]Nicholas Wade, "Now, the Hard Part: Putting the Genome to Work," *The New York Times,* June 27, 2000.

[36]Federation of Societies for Experimental Biology, "*The Benefits of Biomedical Research*," Revised 11/4/99. http://www.faseb.org/opar/benefits

Other areas of the country have already responded to this once in a lifetime opportunity by establishing centers for biomedical research. For example, in Maryland, biomedical research activities are organized around the Johns Hopkins University and the University of Maryland at Baltimore. In New York, various universities have joined with private foundations to build large, shared research facilities. Georgia has established the Georgia Research Alliance, Michigan the "Life Sciences Corridor," North Carolina the Biotechnology Center, New Jersey the Commission on Science and Technology, and Washington the Biotechnology Foundation. All of these biomedical research centers have one thing in common: they involve programs specifically targeted to biomedicine or biotechnology. Some state programs provide funds for building research infrastructure to academic and other institutions. The infrastructure attracts external grants and top rated people to basic biomedical research. Some state programs provide venture capital funding for investments in biomedical product development to private companies; other state programs provide tax credits for this same purpose. The investment helps the products of basic research to be developed more quickly and in greater numbers. Some state programs provide offices that coordinate the transfer of technology between research institutions and private biotechnology companies. The coordination between the various independent players benefits the whole biomedical industry. In general, these programs have produced critical masses of public and private biomedical institutions in these other states. The critical mass promotes the growth of biomedical research in these states. It gives these states a head start in entering the Age of Biology.

Section II presents the strengths and weaknesses of biomedical research in Pennsylvania. The strengths far outweigh the weaknesses. Biomedical research in the Commonwealth is presently strong and vibrant. But correcting the weaknesses is of paramount importance. The problems that were identified in Section II deserve immediate attention and long-run solutions. These problems are systemic in nature and can be corrected with strategic policies. These policies are urgently needed to maintain and build on Pennsylvania's strengths. They are needed now to counter the competition of the other states.

Policies to aid biomedical research in the Commonwealth would produce numerous, large paybacks. Biomedical research promotes a healthy and productive citizenry and workforce. Biomedical research has an enormous impact on the Commonwealth's economy.

## RECOMMENDED POLICIES

The Working Group on Biomedical Research recommends that the following strategic policies be undertaken to sustain and advance biomedical research in Pennsylvania.

***Create a publicly financed Biomedical Research Infrastructure Fund to maintain and improve the biomedical research and development infrastructure in the Commonwealth*.** This fund should have the following general features:

1. An annual distribution from the fund should be made to Pennsylvania academic and other institutions, based on each institution's share of the total awards made by the NIH to all Commonwealth institutions during the preceding year. Since the working group believes that most of the meritorious research projects of individual researchers are already being funded by the NIH, private foundations, etc., the fund should not be distributed to individual researchers for research projects.

2. Monies from the fund should be used to enhance an institution's biomedical research infrastructure--funding for innovation research, or funding to supplement external funding for the other stages of the R&D process performed by the institution; funding to train or otherwise support physician-scientists; or funding for the construction, rehabilitation or maintenance of the buildings, laboratories, equipment, etc., related to biomedical research. Different institutions could elect to use the monies from this distribution for different purposes, according to the institution's individual infrastructure needs.

3. Each institution should be required to make public an annual spending plan, showing how the monies it received from the fund were used to fulfill its infrastructure needs.

The proposed Biomedical Research Infrastructure Fund specifically addresses the infrastructure needs of the research institutions detailed in section II. The distribution of monies to academic and other institutions from the fund should be predicated on the basis of actual NIH awards, since NIH awards are based on a peer-review process, and the awards signify both the scale and worthiness of the institutions' research efforts. Institutions that receive NIH funding already have well-established accounting systems, ensuring that funding from this source would be directed to research infrastructure needs rather than the creation of new bureaucracies to administer the program. The allocation method is independent of the total amount distributed from the fund; the distribution from the fund would be determined by the amount available in the fund each year. Allowing each institution to submit its own infrastructure spending plan for review is optimal, since each institution has unique infrastructure needs, and outside review assures both quality control and

attention to projects with a public purpose. *Tying distributions from this fund to NIH awards sends the correct signal to research institutions: in order to get a greater share of the distribution from the fund, an institution first needs to attract greater funding from the NIH*

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The creation of the Biomedical Infrastructure Funds is the highest policy priority.

***Create a Biomedical Research Venture Capital Fund specifically targeted to biomedical research to assist in the transfer of technology from research institutions to private sector companies for product development*.** This fund should have the following characteristics:

1. The fund should be started as a new Commonwealth program. The large amounts necessary for funding the later-stage development of basic biomedical research, the unique risks involved, and the current investment setting make including this program as a new category in an existing Commonwealth venture capital program less than optimal.[37]

2. The fund should be of sufficient size to fund the investment opportunities of biomedical research companies beyond the earliest stage of product development.

3. The fund should assist small start-up or existing Pennsylvania-based biomedical research companies, not larger existing companies.

4. The fund should have a matching fund requirement. Recipients of monies from the fund should be required to raise matching funds from private venture capitalists and other investors. The Commonwealth should participate as a limited partner.

5. The fund should employ standard venture capital market and competitive assessment criteria. There should be at least one other significant outside investor in the financing round of each investment.

6. A senior, private-sector manager who is experienced in both venture capital funding and biotechnology should head the

[37]The Ben Franklin Partnership and Pennsylvania 21 Initiative are two existing programs that promote economic development in Pennsylvania; both have biotechnology categories. However, these programs do not specifically target biomedical research and are not of sufficient size to fund the later stages of biomedical product development. Both programs could be modified to erase these deficiencies, but a new fund would be more desirable.

fund. The fund manager should be adequately compensated. Some fund services--due diligence, legal, accounting--might be outsourced. The fund should have an advisory board.

7. To as large an extent as possible, the fund should be designed to be self-sustaining through the appreciation of equity investments.

8. The fund should be designed to provide maximum accountability. The Commonwealth should properly audit the uses of public funds. Proper reports should be made available to the public.

9. A program of Commonwealth and local tax incentives might supplement this fund. For example, the "opportunity zone" concept could be used to create Biotechnology Opportunity Zones to promote biomedical research in certain regions of Pennsylvania or small geographic areas around the Commonwealth's academic medical centers. The use of tax incentives to promote biomedical research in Pennsylvania should be further studied.

10. It should be recognized that this recommendation is separate from the recommendation for the establishment of a regional biomedical institute discussed below. Although there is some overlap between the functions of a venture capital fund and some of the functions that could be performed by a virtual or regional institute, the former is best suited to the later stages of product development, while the latter is best suited to the earlier stages.

The proposed Biomedical Research Venture Capital Fund specifically addresses the technology transfer needs of private biomedical research companies detailed in section II. *The rationale for the Commonwealth's establishing a venture capital fund that targets biomedical research investments involves a systemic problem and a market failure.* In the current investment climate, many traditional, private sources of financing are unwilling and unable to wait the relatively lengthy periods needed to achieve liquidity in investments in the biomedical area. A public fund would be more patient.

***Create a virtual institute or regional Biomedical Research Institutes to promote and coordinate biomedical research with private sector applied biomedical development in Pennsylvania, and promote large, regional specializations in biomedical research which would be competitive with other states.*** These institutes should have the following features:

1. The institutes could be bricks-and-mortar institutions, with branches representing several geographic regions of Pennsylvania. Each regional institute should have an independent research focus. For example, an Eastern institute might focus on biological or pharmacological research. A Western institute might focus on biotechnology, including tissue-engineering research. There might also be an institute to represent the middle of the Commonwealth. Research focuses should not be duplicated in the institutes--each institute should be strong in its research focus and able to compete with other states within its specialty. Alternatively, the institutes could be virtual entities. Computers could be used to perform at least some functions of the institutes. In a region, an institute could begin as a virtual entity and evolve into a bricks-and-mortar entity.

2. The institutes could assist in the early-stage development of products from biomedical research, by coordinating the biomedical R&D efforts of research institutions and private sector companies in this stage. To do so, the institutes could have permanent investigators, as well as faculty appointments with affiliated academic institutions. They could provide on-site support for startup biomedical companies. They could develop contractual relationships with existing pharmaceutical and biotechnology companies to facilitate the early-stage of product development. They could provide access to members throughout their regions through grants and visiting faculty programs and memberships.

3. For its regional initiatives in early-stage product development, the institutes would require block grants from the Commonwealth. To be effective, these grants would have to be substantial. Small grants would not be effective and they might even be counter-productive.

4. From some of their activities, the institutes could generate license fees and other revenues. The institutes could also apply for federal grants for translational research. As an institute grows, these revenues could become substantial in size.

5. The institutes should promote biomedical research, especially within the individual focus areas of their regions.

The proposed Biomedical Research Institutes specifically address the need for strong, regional entities to assist in the translational biomedical research process related to regional specialties and to coordinate and promote biomedical research activities between the public and private sectors within regional

settings. They are needed for Pennsylvania to compete with the developmental initiatives of other states. They accent the strong, individual institutions already in place in the Commonwealth and can make these institutions even more effective.

The creation of the Biomedical Research Institutes is the third highest policy priority.

The health services and biotechnology industries are major economic assets for Pennsylvania, along with agriculture and manufacturing. The protection and enhancement of the biotechnology industry should be a strategic economic development goal in Pennsylvania. The three major policy actions recommended by the working group are specifically targeted to biomedical research and should be immediately integrated into the Commonwealth's overall economic development program. However, it is also important that other existing Commonwealth economic development programs be evaluated for their application to biotechnology. If these programs do not presently apply to biotechnology, they should be amended to include biotechnology.

**Create a Medical Student Debt-Relief Program.** In addition to these three major strategic policy actions, the working group also recommends that Pennsylvania institute a Medical Student Debt-Relief Program that addresses the problem of the very high debt load of students graduating from the Commonwealth's medical schools. In exchange for commitments by the students to remain in Pennsylvania in biomedical research positions for a specified period of time, this program should relieve a portion of the educational debts of graduating medical school students.

As shown in section II, the accumulated educational debt load of Pennsylvania medical students in recent years ranks high among comparable states. These large debts have two, adverse consequences for biomedical research in the Commonwealth. First, many graduating students with large medical school debts are forced to leave Pennsylvania for more lucrative employment elsewhere. Second, even those who stay do not choose careers in research in sufficient numbers, because research positions typically do not pay as well as other medical specialties. The Medical Student Debt-Relief Program would help to moderate Pennsylvania's decline in physician-scientists, thereby enhancing the Commonwealth's research infrastructure.

The working group considers these policy recommendations to be steps in the long-run solution of the systemic weaknesses in the biomedical research process in Pennsylvania. The policies should be time-phased and implemented in order of their priorities. Except where noted, existing budgets and institutions should be used to implement each policy action. Each policy may be needed on a permanent or temporary basis, depending on the future path of the factors that underlie the policy's need. The policies will require varying times to produce

results. Some funding sources may become self-sustaining. Some policies will require modification over time. Pennsylvania's biomedical research industry should be reassessed periodically to insure that strengths and weaknesses are continuously monitored and acted upon.

# GLOSSARY

**Assay**

The determination of the amount of a particular constituent of a mixture of the biological or pharmacological potency of a drug.

**Clinical**

Pertaining to or founded on actual observation and treatment of patients, as distinguished from theoretical or basis science.

**Clinical trial, phase I**

A pre-planned, usually controlled, clinical study of the safety and efficacy of diagnostic, therapeutic, or prophylactic drugs, devices, or techniques based on a small number of healthy persons and conducted over the period of about a year in either the United States or a foreign country.

**Clinical trial, phase II**

A pre-planned, usually controlled, clinical study of the safety and efficacy of diagnostic, therapeutic, or prophylactic drugs, devices, or techniques based on several hundred volunteers, including a limited number of patients, and conducted over a period of about two years in either the United States or a foreign country.

**Clinical trial, phase III**

A pre-planned, usually controlled, clinical study of the safety and efficacy of diagnostic, therapeutic, or prophylactic drugs, devices, or techniques after phase II trials. A large enough group of patients is studied and closely monitored by physicians for adverse response to long-term exposure, over a period of about three years in either the United States or a foreign country.

**Diagnostic**

Refers to something that is used to determine the cause of an illness or disorder.

**Efficacy**

Strength, effectiveness. The ability of a drug to control or cure an illness.

**Hypothesis**

A supposition that appears to explain a group of phenomena and is advanced as a basis for further investigation, a proposition that is subject to proof or to an experimental or statistical test.

**Macromolecule**

Biological term relating to large molecules including, proteins, nucleic acids and carbohydrates, but probably not phospholipids.

**Molecular**

Of, pertaining to or composed of molecules: a very small mass of matter.

**Peer-review**

Scrutiny by one's peers (equals).

**Phenomenology**

A description, history, or explanation of phenomena.

**Principal investigator**

The head researcher responsible for organizing and overseeing a clinical trial.

**Therapeutic**

Compounds that are used to treat specific diseases or medical conditions.

**Toxicology**

The scientific study of the chemistry, effects, and treatment of poisonous substances.

SOURCE: Academic Medical Publishing, *On-line Medical Dictionary*, 1997-98.

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# APPENDICES

APPENDIX A - 1
TOTAL NIH AWARDS TO INDIVIDUAL PENNSYLVANIA INSTITUTIONS
Total Awards, No. of Awards and Average Awards
1989 to 1998

| Institution | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 10-Year Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ACADEMY OF NATURAL SCIENCES | | | | | | | | | | | |
| Total Awards | $101,530 | $115,249 | $118,431 | $132,925 | $153,657 | $147,914 | $152,741 | | $170,760 | | $1,093,207 |
| No. of Awards | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | 1 | | 8 |
| Average Awards | $101,530 | $115,249 | $118,431 | $132,925 | $153,657 | $147,914 | $152,741 | | $170,760 | | $136,651 |
| ACTUARIAL FORECASTING AND RESEARCH | | | | | | | | | | | |
| Total Awards | | | | | | $78,713 | $400,438 | $246,932 | | | $726,083 |
| No. of Awards | | | | | | 1 | 1 | 1 | | | 3 |
| Average Awards | | | | | | $78,713 | $400,438 | 246932 | | | $242,028 |
| ADOLOR CORPORATION | | | | | | | | | | | |
| Total Awards | | | | | | | | | $99,983 | | $99,983 |
| No. of Awards | | | | | | | | | 1 | | 1 |
| Average Awards | | | | | | | | | $99,983 | | $99,983 |
| ADVENT HEALTH TECHNOLOGY | | | | | | | | | | | |
| Total Awards | | | | | | | $100,000 | | | | $100,000 |
| No. of Awards | | | | | | | 1 | | | | 1 |
| Average Awards | | | | | | | $100,000 | | | | $100,000 |
| AIDS COMMUNITY ALLIANCE | | | | | | | | | | | |
| Total Awards | | | | | | | | | | $40,000 | $40,000 |
| No. of Awards | | | | | | | | | | 1 | 1 |
| Average Awards | | | | | | | | | | $40,000 | $40,000 |
| ALBERT EINSTEIN MED CTR (PHILADELPHIA) | | | | | | | | | | | |
| Total Awards | $380,489 | $277,446 | $138,233 | $242,401 | $255,865 | $447,921 | $744,744 | $695,424 | $368,879 | $134,110 | $3,685,512 |
| No. of Awards | 3 | 4 | 4 | 4 | 2 | 3 | 3 | 3 | 2 | 1 | 29 |
| Average Awards | $126,830 | $69,362 | $34,558 | $60,600 | $127,933 | $149,307 | $248,248 | $231,808 | $184,440 | $134,110 | $127,087 |
| ALLEGHENY COLLEGE | | | | | | | | | | | |
| Total Awards | | $62,050 | $100,095 | | $90,290 | | | | | | $252,435 |
| No. of Awards | | 1 | 1 | | 1 | | | | | | 3 |
| Average Awards | | $62,050 | $100,095 | | $90,290 | | | | | | $84,145 |
| ALLEGHENY COUNTY HUMAN SERVICES DEPT | | | | | | | | | | | |
| Total Awards | $798,205 | $703,960 | $304,271 | | | | | | | | $1,806,436 |
| No. of Awards | 1 | 1 | | | | | | | | | 2 |
| Average Awards | $798,205 | $703,960 | | | | | | | | | $903,218 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ALLEGHENY GENERAL HOSP (PITTSBURGH) | | | | | | | | | | | |
| Total Awards | | | | | $389,831 | $408,245 | $96,714 | $418,883 | $730,147 | | $2,043,820 |
| No. of Awards | | | | | 2 | 2 | 1 | 2 | 3 | | 10 |
| Average Awards | | | | | $194,916 | $204,123 | $96,714 | $209,442 | $243,382 | | $204,382 |
| ALLEGHENY UNIVERSITY OF HEALTH SCIENCES | | | | | | | | | | | |
| Total Awards | $10,070,642 | $13,256,722 | $17,679,996 | $16,195,987 | $15,896,544 | $16,243,949 | $23,414,042 | $24,623,244 | $34,237,908 | $33,657,391 | $205,276,425 |
| No. of Awards | 60 | 63 | 77 | 71 | 70 | 72 | 110 | 114 | 148 | 147 | 932 |
| Average Awards | $167,844 | $210,424 | $229,610 | $228,112 | $227,093 | $225,610 | $212,855 | $215,993 | $231,337 | $228,962 | $220,254 |
| ALLEGHENY-SINGER RESEARCH INSTITUTE | | | | | | | | | | | |
| Total Awards | $1,086,895 | $1,222,964 | $1,764,649 | $1,521,992 | $1,956,233 | $1,645,133 | $1,473,489 | $13,730,813 | $13,648,016 | $3,700,414 | $41,750,598 |
| No. of Awards | 7 | 8 | 11 | 12 | 12 | 12 | 9 | 13 | 12 | 9 | 105 |
| Average Awards | $155,271 | $152,871 | $160,423 | $126,833 | $163,019 | $137,094 | $163,721 | $1,056,216 | $1,137,335 | $411,157 | $397,625 |
| AMERICAN AGING ASSOCIATION | | | | | | | | | | | |
| Total Awards | | | | | | $8,400 | $13,531 | $15,000 | | | $36,931 |
| No. of Awards | | | | | | 1 | 1 | 1 | | | 3 |
| Average Awards | | | | | | $8,400 | $13,531 | $15,000 | | | $12,310 |
| AMERICAN ASSOCIATION FOR CANCER RESEARCH | | | | | | | | | | | |
| Total Awards | $16,000 | $23,126 | $14,250 | $190,015 | $331,976 | $325,909 | $362,061 | $500,661 | $603,906 | $587,842 | $2,955,746 |
| No. of Awards | 3 | 3 | 2 | 6 | 6 | 6 | 3 | 4 | 5 | 5 | 43 |
| Average Awards | $5,333 | $7,709 | $7,125 | $31,669 | $55,329 | $54,318 | $120,687 | $125,165 | $120,781 | $117,568 | $68,738 |
| AMERICAN COLLEGE OF PHYSICIANS | | | | | | | | | | | |
| Total Awards | | | | | | | | | $70,000 | | $70,000 |
| No. of Awards | | | | | | | | | 1 | | 1 |
| Average Awards | | | | | | | | | $70,000 | | $70,000 |
| AMERICAN MOTILITY SOCIETY | | | | | | | | | | | |
| Total Awards | | $5,000 | | | | | | | | | $5,000 |
| No. of Awards | | 1 | | | | | | | | | 1 |
| Average Awards | | $5,000 | | | | | | | | | $5,000 |
| ANATEK, INC. | | | | | | | | | | | |
| Total Awards | | | | | | | $174,555 | $80,423 | | | $254,978 |
| No. of Awards | | | | | | | 2 | 1 | | | 3 |
| Average Awards | | | | | | | $87,278 | $80,423 | | | $84,993 |
| ANIMAS CORPORATION | | | | | | | | | | | |
| Total Awards | | | | | | | | | | $206,028 | $206,028 |
| No. of Awards | | | | | | | | | | 1 | 1 |
| Average Awards | | | | | | | | | | $206,028 | $206,028 |
| APOLLON, INC. | | | | | | | | | | | |
| Total Awards | | | | | | $74,996 | | | | | $74,996 |
| No. of Awards | | | | | | 1 | | | | | 1 |
| Average Awards | | | | | | $74,996 | | | | | $74,996 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| ARGUS RESEARCH LABORATORIES, INC. | | | | | | | | | |
| Total Awards | $46,902 | | | | | | | | $46,902 |
| No. of Awards | 1 | | | | | | | | 1 |
| Average Awards | $46,902 | | | | | | | | $46,902 |
| ARRAY VISION ENGINEERING COMPANY | | | | | | | | | |
| Total Awards | | | | | $93,654 | | | | $93,654 |
| No. of Awards | | | | | 1 | | | | 1 |
| Average Awards | | | | | $93,654 | | | | $93,654 |
| ARTSCO, INC. | | | | | | | | | |
| Total Awards | | | | | | $83,551 | $296,758 | $97,997 | $478,306 |
| No. of Awards | | | | | | 1 | 3 | 1 | 5 |
| Average Awards | | | | | | $83,551 | $98,919 | $97,997 | $95,661 |
| AT BIOCHEM | | | | | | | | | |
| Total Awards | | | $49,996 | | | | | | $49,996 |
| No. of Awards | | | 1 | | | | | | 1 |
| Average Awards | | | $49,996 | | | | | | $49,996 |
| AUGMENTECH, INC. | | | | | | | | | |
| Total Awards | $39,325 | | | $80,246 | $94,570 | | $100,000 | $368,251 | $682,392 |
| No. of Awards | 1 | | | 1 | 1 | | 1 | 1 | 5 |
| Average Awards | $39,325 | | | $80,246 | $94,570 | | $100,000 | $368,251 | $136,478 |
| AUTOMATED CELL TECHNOLOGIES, INC. | | | | | | | | | |
| Total Awards | | | | | | | $200,000 | | $200,000 |
| No. of Awards | | | | | | | 2 | | 2 |
| Average Awards | | | | | | | $100,000 | | $100,000 |
| AVECON DIAGNOSTICS, INC. | | | | | | | | | |
| Total Awards | | | | | | | $96,200 | | $96,200 |
| No. of Awards | | | | | | | 1 | | 1 |
| Average Awards | | | | | | | $96,200 | | $96,200 |
| AVID THERAPEUTICS, INC. | | | | | | | | | |
| Total Awards | | | | $49,410 | | | | $100,000 | $149,410 |
| No. of Awards | | | | 1 | | | | 1 | 2 |
| Average Awards | | | | $49,410 | | | | $100,000 | $74,705 |
| AVITECH DIAGNOSTICS | | | | | | | | | |
| Total Awards | | | | | $75,000 | $335,349 | $294,000 | | $704,349 |
| No. of Awards | | | | | 1 | 1 | 1 | | 3 |
| Average Awards | | | | | $75,000 | $335,349 | $294,000 | | $234,783 |
| BEARSDEN BIO, INC. | | | | | | | | | |
| Total Awards | | | | | | | $186,038 | $395,000 | $470,639 | $1,051,677 |
| No. of Awards | | | | | | | 2 | 4 | 2 | 8 |
| Average Awards | | | | | | | $93,019 | $98,750 | $235,320 | $131,460 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| BEAVER COLLEGE | | | | | | | | | | | |
| Total Awards | | | | | | $100,271 | $136,057 | $121,032 | $55,471 | | $412,831 |
| No. of Awards | | | | | | 1 | 1 | 1 | 1 | | 4 |
| Average Awards | | | | | | $100,271 | $136,057 | $121,032 | $55,471 | | $103,208 |
| BELMONT CENTER/COMPREHENSIVE TREATMENT | | | | | | | | | | | |
| Total Awards | $299,379 | $322,889 | $190,033 | | $163,460 | $238,608 | $175,612 | | | | $1,389,981 |
| No. of Awards | 1 | 3 | 1 | | 1 | 1 | 1 | | | | 8 |
| Average Awards | $299,379 | $107,630 | $190,033 | | $163,460 | $238,608 | $175,612 | | | | $173,748 |
| BIO MED SCIENCES, INC. | | | | | | | | | | | |
| Total Awards | | $100,000 | $50,000 | $50,000 | | | | | | | $200,000 |
| No. of Awards | | 2 | 1 | 1 | | | | | | | 4 |
| Average Awards | | $50,000 | $50,000 | $50,000 | | | | | | | $50,000 |
| BIOFOR, INC. | | | | | | | | | | | |
| Total Awards | | | | | $50,000 | | | | | | $50,000 |
| No. of Awards | | | | | 1 | | | | | | 1 |
| Average Awards | | | | | $50,000 | | | | | | $50,000 |
| BIOLOGICAL ABSTRACTS | | | | | | | | | | | |
| Total Awards | $167,980 | $178,340 | $185,722 | $220,000 | $232,000 | $430,991 | $263,500 | $297,000 | $297,000 | $342,000 | $2,614,533 |
| No. of Awards | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 11 |
| Average Awards | $167,980 | $178,340 | $92,861 | $220,000 | $232,000 | $430,991 | $263,500 | $297,000 | $297,000 | $342,000 | $237,685 |
| BIOMATION, LTD. | | | | | | | | | | | |
| Total Awards | | | | | | | | $77,184 | | | $77,184 |
| No. of Awards | | | | | | | | 1 | | | 1 |
| Average Awards | | | | | | | | $77,184 | | | $77,184 |
| BIOMED RESEARCH AND TECHNOLOGIES, INC. | | | | | | | | | | | |
| Total Awards | | | | | | | | $98,102 | | $165,322 | $263,424 |
| No. of Awards | | | | | | | | 1 | | 1 | 2 |
| Average Awards | | | | | | | | $98,102 | | $165,322 | $131,712 |
| BIOMOL RESEARCH LABORATORIES, INC. | | | | | | | | | | | |
| Total Awards | | $50,000 | | $50,000 | $99,834 | | | | | | $199,834 |
| No. of Awards | | 1 | | 1 | 2 | | | | | | 4 |
| Average Awards | | $50,000 | | $50,000 | $49,917 | | | | | | $49,959 |
| BIOPORE, INC. | | | | | | | | | | | |
| Total Awards | | | | | | | | | $91,596 | $99,491 | $191,087 |
| No. of Awards | | | | | | | | | 1 | 1 | 2 |
| Average Awards | | | | | | | | | $91,596 | $99,491 | $95,544 |
| BIOSYN, INC. | | | | | | | | | | | |
| Total Awards | | | | | | $99,247 | | | | | $99,247 |
| No. of Awards | | | | | | 1 | | | | | 1 |
| Average Awards | | | | | | $99,247 | | | | | $99,247 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| BIPHASICS, INC. | | | | | | | | | | | |
| Total Awards | | | $50,000 | $45,900 | | | | | | | $95,900 |
| No. of Awards | | | 1 | 1 | | | | | | | 2 |
| Average Awards | | | $50,000 | $45,900 | | | | | | | $47,950 |
| BLOOMSBURG UNIVERSITY OF PENNSYLVANIA | | | | | | | | | | | |
| Total Awards | $26,438 | | | | | | | | | | $26,438 |
| No. of Awards | 1 | | | | | | | | | | 1 |
| Average Awards | $26,438 | | | | | | | | | | $26,438 |
| BLUE LIGHTNING DATA AND SOFTWARE, INC. | | | | | | | | | | | |
| Total Awards | | | | | $100,000 | | | | | | $100,000 |
| No. of Awards | | | | | 2 | | | | | | 2 |
| Average Awards | | | | | $50,000 | | | | | | $50,000 |
| BROUDY PRINTING, INC. | | | | | | | | | | | |
| Total Awards | | | $868,090 | | | | | | | | $868,090 |
| No. of Awards | | | 2 | | | | | | | | 2 |
| Average Awards | | | $434,045 | | | | | | | | $434,045 |
| BRYN MAWR COLLEGE | | | | | | | | | | | |
| Total Awards | $345,111 | $363,849 | $591,638 | $594,738 | $235,902 | $481,682 | $379,457 | $380,738 | $180,582 | $228,513 | $3,782,210 |
| No. of Awards | 4 | 3 | 6 | 6 | 3 | 4 | 2 | 1 | 2 | 3 | 34 |
| Average Awards | $86,278 | $121,283 | $98,606 | $99,123 | $78,634 | $120,421 | $189,729 | $380,738 | $90,291 | $76,171 | $111,241 |
| BUCKNELL UNIVERSITY | | | | | | | | | | | |
| Total Awards | $66,603 | $124,234 | $128,843 | $68,290 | $68,176 | $74,089 | | | $181,573 | | $711,808 |
| No. of Awards | 1 | 2 | 2 | 1 | 1 | 1 | | | 2 | | 10 |
| Average Awards | $66,603 | $62,117 | $64,422 | $68,290 | $68,176 | $74,089 | | | $90,787 | | $71,181 |
| C AND L INSTRUMENTS, INC. | | | | | | | | | | | |
| Total Awards | | | | | | | $99,085 | | $307,876 | $301,702 | $708,663 |
| No. of Awards | | | | | | | 1 | | 1 | 1 | 3 |
| Average Awards | | | | | | | $99,085 | | $307,876 | $301,702 | $236,221 |
| CARDIOPULMARY TECHNOLOGIES, INC. | | | | | | | | | | | |
| Total Awards | | | | | | | | | | $199,955 | $199,955 |
| No. of Awards | | | | | | | | | | 2 | 2 |
| Average Awards | | | | | | | | | | $99,978 | $99,978 |
| CARLOW COLLEGE | | | | | | | | | | | |
| Total Awards | | | | | | $145,684 | $91,750 | | $75,084 | $98,452 | $410,970 |
| No. of Awards | | | | | | 1 | 1 | | 1 | 1 | 4 |
| Average Awards | | | | | | $145,684 | $91,750 | | $75,084 | $98,452 | $102,743 |
| CARNEGIE MELLON UNIVERSITY | | | | | | | | | | | |
| Total Awards | $7,550,160 | $6,611,103 | $8,227,903 | $7,996,928 | $9,811,553 | $9,687,288 | $9,721,614 | $9,686,072 | $10,821,606 | $10,990,834 | $91,105,061 |
| No. of Awards | 54 | 45 | 52 | 45 | 51 | 48 | 56 | 55 | 59 | 51 | 516 |
| Average Awards | $139,818 | $146,913 | $158,229 | $177,710 | $192,383 | $201,819 | $173,600 | $176,110 | $183,417 | $215,507 | $176,560 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CELLOMICS, INC. | | | | | | | | | | | |
| Total Awards | | | | | | | | | | $430,875 | $430,875 |
| No. of Awards | | | | | | | | | | 2 | 2 |
| Av erage Awards | | | | | | | | | | $215,438 | $215,438 |
| CENTOCOR, INC. | | | | | | | | | | | |
| Total Awards | | | | | $12,375 | $12,375 | $304,375 | $236,250 | | | $565,375 |
| No. of Awards | | | | | 1 | 1 | 1 | 1 | | | 4 |
| Average Awards | | | | | $12,375 | $12,375 | $304,375 | $236,250 | | | $141,344 |
| CEPHALON, INC. | | | | | | | | | | | |
| Total Awards | $50,000 | $50,000 | | $200,040 | | | | | | | $300,040 |
| No. of Awards | 1 | 1 | | 1 | | | | | | | 3 |
| Average Awards | $50,000 | $50,000 | | $200,040 | | | | | | | $100,013 |
| CHARCOT-MARIE-TOOTH ASSOCIATION | | | | | | | | | | | |
| Total Awards | | | | | | | | | | $30,000 | $30,000 |
| No. of Awards | | | | | | | | | | 1 | 1 |
| Average Awards | | | | | | | | | | $30,000 | $30,000 |
| CHEM-SPACE ASSOCIATES | | | | | | | | | | | |
| Total Awards | | | | | | | | $93,732 | | | $93,732 |
| No. of Awards | | | | | | | | 1 | | | 1 |
| Average Awards | | | | | | | | $93,732 | | | $93,732 |
| CHERRYSTONE CORPORATION | | | | | | | | | | | |
| Total Awards | | | | | $50,000 | | | | | $100,000 | $150,000 |
| No. of Awards | | | | | 1 | | | | | 1 | 2 |
| Average Awards | | | | | $50,000 | | | | | $100,000 | $75,000 |
| CHESTER COUNTY AIDS SUPPORT SERVICES | | | | | | | | | | | |
| Total Awards | | | | | | | | | $34,802 | | $34,802 |
| No. of Awards | | | | | | | | | 1 | | 1 |
| Average Awards | | | | | | | | | $34,802 | | $34,802 |
| CHI SYSTEMS, INC. | | | | | | | | | | | |
| Total Awards | | | | | | $50,000 | $544,895 | $757,448 | $752,238 | $567,919 | $2,672,500 |
| No. of Awards | | | | | | 1 | 3 | 2 | 2 | 3 | 11 |
| Average Awards | | | | | | $50,000 | $181,632 | $378,724 | $376,119 | $189,306 | $242,955 |
| CHILDREN'S HOSPITAL OF PHILADELPHIA | | | | | | | | | | | |
| Total Awards | $12,310,621 | $12,479,864 | $13,579,811 | $15,933,486 | $19,569,761 | $23,371,890 | $25,653,043 | $26,315,007 | $28,623,828 | $33,494,352 | $211,331,663 |
| No. of Awards | 52 | 56 | 56 | 64 | 64 | 65 | 74 | 79 | 87 | 109 | 706 |
| Average Awards | $236,743 | $222,855 | $242,497 | $248,961 | $305,778 | $359,568 | $346,663 | $333,101 | $329,010 | $307,288 | $299,337 |
| CHILDREN'S HOSPITAL OF PITTSBURGH | | | | | | | | | | | |
| Total Awards | $3,635,267 | $3,942,346 | $3,667,760 | $7,241,305 | $7,343,630 | $7,945,617 | $7,220,147 | $7,618,995 | $7,413,798 | $5,164,081 | $61,192,946 |
| No. of Awards | 15 | 14 | 20 | 27 | 26 | 24 | 24 | 23 | 26 | 20 | 219 |
| Average Awards | $242,351 | $281,596 | $183,388 | $268,196 | $282,447 | $331,067 | $300,839 | $331,261 | $285,146 | $258,204 | $279,420 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| CHILDREN'S SEASHORE HOUSE | | | | | | | | | |
| Total Awards | | | | | $202,263 | $227,332 | $277,335 | $284,921 | $991,851 |
| No. of Awards | | | | | 2 | 3 | 2 | 2 | 9 |
| Average Awards | | | | | $101,132 | $75,777 | $138,668 | $142,461 | $110,206 |
| CITIZENS GENERAL HOSPITAL | | | | | | | | | |
| Total Awards | $4,000 | | | | | | | | $4,000 |
| No. of Awards | 1 | | | | | | | | 1 |
| Average Awards | $4,000 | | | | | | | | $4,000 |
| CLINICAL TOOLS, INC. | | | | | | | | | |
| Total Awards | | | | | $399,339 | $350,661 | $199,194 | $199,493 | $1,148,687 |
| No. of Awards | | | | | 1 | 1 | 2 | 2 | 6 |
| Average Awards | | | | | $399,339 | $350,661 | $99,597 | $99,747 | $191,448 |
| COACT TECHNOLOGIES | | | | | | | | | |
| Total Awards | $47,616 | | $260,149 | $239,851 | | | | | $547,616 |
| No. of Awards | 1 | | 1 | 1 | | | | | 3 |
| Average Awards | $47,616 | | $260,149 | $239,851 | | | | | $182,539 |
| COGENICS, INC. | | | | | | | | | |
| Total Awards | | | | $49,500 | | | | | $49,500 |
| No. of Awards | | | | 1 | | | | | 1 |
| Average Awards | | | | $49,500 | | | | | $49,500 |
| COMMUNITY COLLEGE OF ALLEGHENY CNTY ALLE | | | | | | | | | |
| Total Awards | | | | | | $201,552 | | | $201,552 |
| No. of Awards | | | | | | 1 | | | 1 |
| Average Awards | | | | | | $201,552 | | | $201,552 |
| COMMUNITY SERVICES INSTITUTE, INC. | | | | | | | | | |
| Total Awards | $224,101 | | | | | | | | $224,101 |
| No. of Awards | 1 | | | | | | | | 1 |
| Average Awards | $224,101 | | | | | | | | $224,101 |
| COMPASS INFORMATION SERVICES, INC. | | | | | | | | | |
| Total Awards | | | | | $100,000 | $334,407 | | | $434,407 |
| No. of Awards | | | | | 1 | 1 | | | 2 |
| Average Awards | | | | | $100,000 | $334,407 | | | $217,204 |
| COMPUTATIONAL DIAGNOSTICS, INC. | | | | | | | | | |
| Total Awards | | | | | | | $100,000 | | $100,000 |
| No. of Awards | | | | | | | 1 | | 1 |
| Average Awards | | | | | | | $100,000 | | $100,000 |
| COMPUTER HUMAN INTERFACE, INC. | | | | | | | | | |
| Total Awards | | $264,814 | $234,220 | | | | | | $499,034 |
| No. of Awards | | 1 | 1 | | | | | | 2 |
| Average Awards | | $264,814 | $234,220 | | | | | | $249,517 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| CONREX PHARMACEUTICAL CORPORATION | | | | | | | | | |
| Total Awards | $50,000 | | | | | | | | $50,000 |
| No. of Awards | 1 | | | | | | | | 1 |
| Average Awards | $50,000 | | | | | | | | $50,000 |
| CONSAD RESEARCH CORPORATION | | | | | | | | | |
| Total Awards | $144,905 | $251,296 | $596,347 | $348,945 | | | | | $1,341,493 |
| No. of Awards | 1 | 1 | 2 | 2 | | | | | 6 |
| Average Awards | $144,905 | $251,296 | $298,174 | $174,473 | | | | | $223,582 |
| CONSERVATION CENTER/ARTS & HIST ARTIFCTS | | | | | | | | | |
| Total Awards | | | $20,041 | $21,071 | $20,141 | | | | $61,253 |
| No. of Awards | | | 1 | 1 | 1 | | | | 3 |
| Average Awards | | | $20,041 | $21,071 | $20,141 | | | | $20,418 |
| COSTELLO PHARMACEUTICAL | | | | | | | | | |
| Total Awards | | | | | | | $99,631 | | $99,631 |
| No. of Awards | | | | | | | 1 | | 1 |
| Average Awards | | | | | | | $99,631 | | $99,631 |
| CROZER-KEYSTONE HEALTH SYSTEM | | | | | | | | | |
| Total Awards | | | | | | $28,481 | | | $28,481 |
| No. of Awards | | | | | | 1 | | | 1 |
| Average Awards | | | | | | $28,481 | | | $28,481 |
| CYBERGENETICS COMPANY | | | | | | | | | |
| Total Awards | | | | | | | $100,000 | $438,007 | $538,007 |
| No. of Awards | | | | | | | 1 | 1 | 2 |
| Average Awards | | | | | | | $100,000 | $438,007 | $269,004 |
| DANIEL H. WAGNER ASSOCIATES | | | | | | | | | |
| Total Awards | | | | | $49,938 | $80,589 | $298,541 | $366,975 | $575,419 | $1,371,462 |
| No. of Awards | | | | | 1 | 1 | 3 | 1 | 3 | 9 |
| Average Awards | | | | | $49,938 | $80,589 | $99,514 | $366,975 | $191,806 | $152,385 |
| DATING VIOLENCE PREVENTION PROJECT, INC. | | | | | | | | | |
| Total Awards | | | | | | | | $93,600 | $18,975 | $112,575 |
| No. of Awards | | | | | | | | 1 | | 1 |
| Average Awards | | | | | | | | $93,600 | | $112,575 |
| DELAWARE WATER GAP SCIENCE INSTITUTE | | | | | | | | | |
| Total Awards | | | | | | | | $197,334 | $193,259 | $390,593 |
| No. of Awards | | | | | | | | 1 | 1 | 2 |
| Average Awards | | | | | | | | $197,334 | $193,259 | $195,297 |
| DELTAMETRICS | | | | | | | | | |
| Total Awards | | | | | | | | | $98,099 | $98,099 |
| No. of Awards | | | | | | | | | 1 | 1 |
| Average Awards | | | | | | | | | $98,099 | $98,099 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| DEMEGEN, INC. | | | | | | | | | | | |
| Total Awards | | | | | | | | | $100,000 | $98,515 | $198,515 |
| No. of Awards | | | | | | | | | 1 | 1 | 2 |
| Average Awards | | | | | | | | | $100,000 | $98,515 | $99,258 |
| DENTALASERS | | | | | | | | | | | |
| Total Awards | | $50,000 | | | | | | | | | $50,000 |
| No. of Awards | | 1 | | | | | | | | | 1 |
| Average Awards | | $50,000 | | | | | | | | | $50,000 |
| DIAGNOSTIC AND REHABILITATION CENTER | | | | | | | | | | | |
| Total Awards | $611,589 | | | | | | | | | | $611,589 |
| No. of Awards | 1 | | | | | | | | | | 1 |
| Average Awards | $611,589 | | | | | | | | | | $611,589 |
| DICKINSON COLLEGE | | | | | | | | | | | |
| Total Awards | | | $100,503 | $97,236 | | | | | $89,550 | | $287,289 |
| No. of Awards | | | 1 | 1 | | | | | 1 | | 3 |
| Average Awards | | | $100,503 | $97,236 | | | | | $89,550 | | $95,763 |
| DIGESTIVE CARE, INC. | | | | | | | | | | | |
| Total Awards | | | | | | $300,477 | $274,153 | | | | $574,630 |
| No. of Awards | | | | | | 1 | 2 | | | | 3 |
| Average Awards | | | | | | $300,477 | $137,077 | | | | $191,543 |
| DREXEL UNIVERSITY | | | | | | | | | | | |
| Total Awards | $1,289,872 | $1,690,022 | $1,825,204 | $2,130,280 | $761,903 | $1,826,717 | $1,574,088 | $1,399,553 | $1,110,620 | $2,310,622 | $15,918,881 |
| No. of Awards | 10 | 12 | 13 | 12 | 7 | 8 | 8 | 5 | 6 | 8 | 89 |
| Average Awards | $128,987 | $140,835 | $140,400 | $177,523 | $108,843 | $228,340 | $196,761 | $279,911 | $185,103 | $288,828 | $178,864 |
| DUBOIS REGIONAL MEDICAL CENTER | | | | | | | | | | | |
| Total Awards | | | $8,007 | | | | | | | | $8,007 |
| No. of Awards | | | 1 | | | | | | | | 1 |
| Average Awards | | | $8,007 | | | | | | | | $8,007 |
| DUQUESNE LITHO, INC. | | | | | | | | | | | |
| Total Awards | | $14,610 | $5,760 | | | | | | | | $20,370 |
| No. of Awards | | 1 | 1 | | | | | | | | 2 |
| Average Awards | | $14,610 | $5,760 | | | | | | | | $10,185 |
| DUQUESNE UNIVERSITY | | | | | | | | | | | |
| Total Awards | $78,089 | $79,835 | $541,734 | $262,122 | $323,908 | $255,859 | $127,077 | $193,176 | $369,811 | $961,522 | $3,193,133 |
| No. of Awards | 1 | 1 | 6 | 3 | 4 | 3 | 1 | 1 | 3 | 8 | 31 |
| Average Awards | $78,089 | $79,835 | $90,289 | $87,374 | $80,977 | $85,286 | $127,077 | $193,176 | $123,270 | $120,190 | $103,004 |
| DYMAX CORPORATION | | | | | | | | | | | |
| Total Awards | | | | $50,000 | | | | | | | $50,000 |
| No. of Awards | | | | 1 | | | | | | | 1 |
| Average Awards | | | | $50,000 | | | | | | | $50,000 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| DYNAMIC DIGITAL DISPLAYS, INC. | | | | | | | | | | |
| Total Awards | $266,619 | | $233,382 | | | | | | | $500,001 |
| No. of Awards | 1 | | 1 | | | | | | | 2 |
| Average Awards | $266,619 | | $233,382 | | | | | | | $250,001 |
| EDINBORO UNIVERSITY OF PENNSYLVANIA | | | | | | | | | | |
| Total Awards | $85,488 | $82,641 | $83,402 | | | | | | | $251,531 |
| No. of Awards | 1 | 1 | 1 | | | | | | | 3 |
| Average Awards | $85,488 | $82,641 | $83,402 | | | | | | | $83,844 |
| ELIZABETHTOWN COLLEGE | | | | | | | | | | |
| Total Awards | | | | | | | $90,545 | | | $90,545 |
| No. of Awards | | | | | | | 1 | | | 1 |
| Average Awards | | | | | | | $90,545 | | | $90,545 |
| EMERGENCY CARE RESEARCH INSTITUTE | | | | | | | | | | |
| Total Awards | | | $141,995 | $259,442 | $199,805 | $183,375 | $249,846 | $252,454 | | $1,286,917 |
| No. of Awards | | | 1 | 1 | 1 | 1 | 1 | 1 | | 6 |
| Average Awards | | | $141,995 | $259,442 | $199,805 | $183,375 | $249,846 | $252,454 | | $214,486 |
| ENZYMATICS, INC. | | | | | | | | | | |
| Total Awards | $49,609 | $500,000 | | | $99,998 | | | | | $649,607 |
| No. of Awards | 1 | 1 | | | 2 | | | | | 4 |
| Average Awards | $49,609 | $500,000 | | | $49,999 | | | | | $162,402 |
| EPHRATA COMMUNITY HOSPITAL | | | | | | | | | | |
| Total Awards | | | | | | | | $27,265 | | $27,265 |
| No. of Awards | | | | | | | | 1 | | 1 |
| Average Awards | | | | | | | | $27,265 | | $27,265 |
| EXOCELL, INC. | | | | | | | | | | |
| Total Awards | | $96,750 | $232,500 | $481,625 | $225,210 | $81,000 | | $432,235 | $856,636 | $2,405,956 |
| No. of Awards | | 2 | 2 | 2 | 1 | 1 | | 2 | 4 | 14 |
| Average Awards | | $48,375 | $116,250 | $240,813 | $225,210 | $81,000 | | $216,118 | $214,159 | $171,854 |
| EXTREL CORPORATION | | | | | | | | | | |
| Total Awards | $43,669 | | $175,580 | | | | | | | $219,249 |
| No. of Awards | 1 | | 2 | | | | | | | 3 |
| Average Awards | $43,669 | | $87,790 | | | | | | | $73,083 |
| EXZYME, INC. | | | | | | | | | | |
| Total Awards | | | | | | | $98,669 | $99,796 | | $198,465 |
| No. of Awards | | | | | | | 1 | 1 | | 2 |
| Average Awards | | | | | | | $98,669 | $99,796 | | $99,233 |
| EYE AND EAR HOSPITAL OF PITTSBURGH | | | | | | | | | | |
| Total Awards | $1,697,902 | $123,932 | | | | | | | | $1,821,834 |
| No. of Awards | 11 | 3 | | | | | | | | 14 |
| Average Awards | $154,355 | $41,311 | | | | | | | | $130,131 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| EYE AND EAR INSTITUTE OF PITTSBURGH | | | | | | | | | | | |
| Total Awards | $594,890 | $2,412,578 | $3,883,891 | $4,393,223 | $4,491,593 | | | | | | $15,776,175 |
| No. of Awards | 5 | 17 | 23 | 26 | 25 | | | | | | 96 |
| Average Awards | $118,978 | $141,916 | $168,865 | $168,970 | $179,664 | | | | | | $164,335 |
| FAMILY HEALTH COUNCIL OF CENT PA | | | | | | | | | | | |
| Total Awards | $34,984 | | | | | | | | | | $34,984 |
| No. of Awards | 1 | | | | | | | | | | 1 |
| Average Awards | $34,984 | | | | | | | | | | $34,984 |
| FERTILITY TESTING LABORATORY | | | | | | | | | | | |
| Total Awards | $148,136 | | | | | | | | | | $148,136 |
| No. of Awards | 1 | | | | | | | | | | 1 |
| Average Awards | $148,136 | | | | | | | | | | $148,136 |
| FIELD DIAGNOSTIC SERVICES, INC. | | | | | | | | | | | |
| Total Awards | | | | | | | | | $409,615 | $571,343 | $980,958 |
| No. of Awards | | | | | | | | | 1 | 2 | 3 |
| Average Awards | | | | | | | | | $409,615 | $285,672 | $326,986 |
| FORSYTH ELECTRO-OPTICS | | | | | | | | | | | |
| Total Awards | | | | | | $66,609 | | | | | $66,609 |
| No. of Awards | | | | | | 1 | | | | | 1 |
| Average Awards | | | | | | $66,609 | | | | | $66,609 |
| FOX CHASE CANCER CENTER | | | | | | | | | | | |
| Total Awards | $8,744,110 | $16,112,365 | $17,211,566 | $17,982,719 | $18,728,237 | $22,681,560 | $23,465,722 | $23,565,358 | $24,299,190 | $23,895,180 | $196,686,007 |
| No. of Awards | 34 | 37 | 43 | 52 | 58 | 62 | 70 | 62 | 61 | 55 | 534 |
| Average Awards | $257,180 | $435,469 | $400,269 | $345,822 | $322,901 | $365,832 | $335,225 | $380,086 | $398,347 | $434,458 | $368,326 |
| FOX FARSIGHT PRODUCTIONS, INC. | | | | | | | | | | | |
| Total Awards | | | | | | | | | | $99,986 | $99,986 |
| No. of Awards | | | | | | | | | | 1 | 1 |
| Average Awards | | | | | | | | | | $99,986 | $99,986 |
| FRANKLIN AND MARSHALL COLLEGE | | | | | | | | | | | |
| Total Awards | $238,037 | | | | | | $22,608 | $23,700 | | | $284,345 |
| No. of Awards | 2 | | | | | | 1 | 1 | | | 4 |
| Average Awards | $119,019 | | | | | | $22,608 | $23,700 | | | $71,086 |
| GEISINGER FOUNDATION | | | | | | | | | | | |
| Total Awards | $6,937 | $8,134 | $112,736 | $109,660 | | $177,852 | $53,228 | $222,753 | $384,242 | | $1,075,542 |
| No. of Awards | 1 | 1 | 2 | 2 | | 1 | 1 | 1 | 1 | | 10 |
| Average Awards | $6,937 | $8,134 | $56,368 | $54,830 | | $177,852 | $53,228 | $222,753 | $384,242 | | $107,554 |
| GEISINGER MEDICAL CENTER | | | | | | | | | | | |
| Total Awards | $868,911 | $668,462 | $574,091 | $712,999 | | | | | | $176,830 | $3,001,293 |
| No. of Awards | 6 | 6 | 4 | 4 | | | | | | 1 | 21 |
| Average Awards | $144,819 | $111,410 | $143,523 | $178,250 | | | | | | $176,830 | $142,919 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| GENE TRANSCRIPTION TECH, INC. | | | | | | | | | | | |
| Total Awards | | | | | | | | | | $99,755 | $99,755 |
| No. of Awards | | | | | | | | | | 1 | 1 |
| Average Awards | | | | | | | | | | $99,755 | $99,755 |
| GENERAL GRAPHIC SERVICES | | | | | | | | | | | |
| Total Awards | | | | | | | | $165,967 | | | $165,967 |
| No. of Awards | | | | | | | | 2 | | | 2 |
| Average Awards | | | | | | | | $82,984 | | | $82,984 |
| GETTYSBURG COLLEGE | | | | | | | | | | | |
| Total Awards | | $122,252 | | $52,882 | | | | | | | $175,134 |
| No. of Awards | | 1 | | 1 | | | | | | | 2 |
| Average Awards | | $122,252 | | $52,882 | | | | | | | $87,567 |
| GRADUATE HOSPITAL (PHILADELPHIA) | | | | | | | | | | | |
| Total Awards | $1,182,664 | $1,348,847 | $1,407,598 | $2,040,774 | $1,817,636 | $1,714,802 | $1,931,923 | $1,150,185 | $1,005,554 | $317,114 | $13,917,097 |
| No. of Awards | 10 | 12 | 12 | 14 | 12 | 10 | 11 | 7 | 5 | 1 | 94 |
| Average Awards | $118,266 | $112,404 | $117,300 | $145,770 | $151,470 | $171,480 | $175,629 | $164,312 | $201,111 | $317,114 | $148,054 |
| GUTHRIE FOUNDATION FOR EDUCATION AND RES | | | | | | | | | | | |
| Total Awards | $162,258 | $162,845 | $100,000 | | $249,208 | $169,149 | $232,687 | $235,982 | $624,161 | $512,661 | $2,448,951 |
| No. of Awards | 1 | 1 | 1 | | 2 | 2 | 2 | 2 | 3 | 2 | 16 |
| Average Awards | $162,258 | $162,845 | $100,000 | | $124,604 | $84,575 | $116,344 | $117,991 | $208,054 | $256,331 | $153,059 |
| HAHNEMANN UNIVERSITY | | | | | | | | | | | |
| Total Awards | $8,332,364 | $6,207,923 | $9,264,164 | $9,195,423 | $8,900,332 | $7,883,497 | | | | | $49,783,703 |
| No. of Awards | 46 | 40 | 44 | 40 | 43 | 40 | | | | | 253 |
| Average Awards | $181,138 | $155,198 | $210,549 | $229,886 | $206,984 | $197,087 | | | | | $196,774 |
| HAVERFORD COLLEGE | | | | | | | | | | | |
| Total Awards | | $102,708 | | | | $103,178 | | | | | $205,886 |
| No. of Awards | | 1 | | | | 1 | | | | | 2 |
| Average Awards | | $102,708 | | | | $103,178 | | | | | $102,943 |
| HAZLETON RESEARCH PRODUCTS, INC. | | | | | | | | | | | |
| Total Awards | $286,515 | $240,591 | $36,067 | $287,805 | $486,911 | $534,407 | $513,030 | $487,752 | $481,343 | | $3,354,421 |
| No. of Awards | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | 8 |
| Average Awards | $286,515 | $240,591 | $36,067 | $287,805 | $486,911 | $534,407 | $513,030 | $487,752 | | | $419,303 |
| HD TECHNOLOGIES, INC. | | | | | | | | | | | |
| Total Awards | | | | | | | $97,000 | | | | $97,000 |
| No. of Awards | | | | | | | 1 | | | | 1 |
| Average Awards | | | | | | | $97,000 | | | | $97,000 |
| HEALTH FEDERATION OF PHILADELPHIA | | | | | | | | | | | |
| Total Awards | | | | | | | $33,748 | | | | $33,748 |
| No. of Awards | | | | | | | 1 | | | | 1 |
| Average Awards | | | | | | | $33,748 | | | | $33,748 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| HERCON LABORATORIES CORPORATION | | | | | | | | | | | |
| Total Awards | $47,830 | | | | | | | | | | $47,830 |
| No. of Awards | 1 | | | | | | | | | | 1 |
| Average Awards | $47,830 | | | | | | | | | | $47,830 |
| HORIZON HOUSE | | | | | | | | | | | |
| Total Awards | $378,376 | $29,695 | | | | | | | | | $408,071 |
| No. of Awards | 1 | | | | | | | | | | 1 |
| Average Awards | $378,376 | | | | | | | | | | $408,071 |
| IMMACULATA COLLEGE | | | | | | | | | | | |
| Total Awards | | | | | | | | | | $37,800 | $37,800 |
| No. of Awards | | | | | | | | | | 1 | 1 |
| Average Awards | | | | | | | | | | $37,800 | $37,800 |
| IMMUNA CARE CORPORATION | | | | | | | | | | | |
| Total Awards | | | $45,250 | | $493,634 | | | | | | $538,884 |
| No. of Awards | | | 1 | | 1 | | | | | | 2 |
| Average Awards | | | $45,250 | | $493,634 | | | | | | $269,442 |
| IMMUNICON CORPORATION | | | | | | | | | | | |
| Total Awards | | | $100,000 | $201,528 | $168,804 | | | | | | $470,332 |
| No. of Awards | | | 2 | 1 | 1 | | | | | | 4 |
| Average Awards | | | $50,000 | $201,528 | $168,804 | | | | | | $117,583 |
| INDIANA UNIVERSITY OF PENNSYLVANIA | | | | | | | | | | | |
| Total Awards | | $85,290 | | $103,336 | | | | | | | $188,626 |
| No. of Awards | | 1 | | 1 | | | | | | | 2 |
| Average Awards | | $85,290 | | $103,336 | | | | | | | $94,313 |
| INDIVIDUAL AWARD--SPEAKER, SUSAN | | | | | | | | | | | |
| Total Awards | | | | | | | | | | $35,285 | $35,285 |
| No. of Awards | | | | | | | | | | 1 | 1 |
| Average Awards | | | | | | | | | | $35,285 | $35,285 |
| INDUSTRIAL BIOCATALYSIS, INC. | | | | | | | | | | | |
| Total Awards | | | | | | | | $198,056 | | | $198,056 |
| No. of Awards | | | | | | | | 2 | | | 2 |
| Average Awards | | | | | | | | $99,028 | | | $99,028 |
| INFORMATION SYSTEMS TECHNOLOGY CORP | | | | | | | | | | | |
| Total Awards | $74,641 | $99,931 | | | | | | | | | $174,572 |
| No. of Awards | 1 | 1 | | | | | | | | | 2 |
| Average Awards | $74,641 | $99,931 | | | | | | | | | $87,286 |
| INFORMATION VENTURES, INC. | | | | | | | | | | | |
| Total Awards | $1,375,828 | $1,476,003 | $1,542,607 | $859,309 | $1,002,253 | $894,485 | $974,985 | $952,076 | $1,028,081 | $875,054 | $10,980,681 |
| No. of Awards | 5 | 3 | 4 | 4 | 5 | 3 | 3 | 4 | 3 | 2 | 36 |
| Average Awards | $275,166 | $492,001 | $385,652 | $214,827 | $200,451 | $298,162 | $324,995 | $238,019 | $342,694 | $437,527 | $305,019 |

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|---|---|---|---|---|---|---|---|---|---|---|---|
| INSTITUTE FOR CANCER RESEARCH | | | | | | | | | | | |
| Total Awards | $15,290,515 | $8,605,211 | $9,242,516 | $10,329,920 | $9,727,629 | $7,965,219 | $7,743,875 | $7,552,518 | $9,416,267 | $8,920,846 | $94,794,516 |
| No. of Awards | 36 | 35 | 34 | 35 | 32 | 32 | 28 | 27 | 41 | 33 | 333 |
| Average Awards | $424,737 | $245,863 | $271,839 | $295,141 | $303,988 | $248,913 | $276,567 | $279,723 | $229,665 | $270,329 | $284,668 |
| INSTITUTE FOR COGNITIVE PROSTHETICS | | | | | | | | | | | |
| Total Awards | | | | $50,000 | $266,846 | $252,786 | | | | $99,541 | $669,173 |
| No. of Awards | | | | 1 | 1 | 1 | | | | 1 | 4 |
| Average Awards | | | | $50,000 | $266,846 | $252,786 | | | | $99,541 | $167,293 |
| INSTITUTE FOR SCIENTIFIC INFORMATION | | | | | | | | | | | |
| Total Awards | | | | | | | $47,031 | | | $56,000 | $103,031 |
| No. of Awards | | | | | | | 1 | | | 1 | 2 |
| Average Awards | | | | | | | $47,031 | | | $56,000 | $51,516 |
| INTEGRA, INC. | | | | | | | | | | | |
| Total Awards | $180,370 | $160,376 | $311,637 | $210,006 | $563,283 | $234,814 | $398,210 | | | | $2,058,696 |
| No. of Awards | 1 | 1 | 3 | 1 | 3 | 1 | 1 | | | | 11 |
| Average Awards | $180,370 | $160,376 | $103,879 | $210,006 | $187,761 | $234,814 | $398,210 | | | | $187,154 |
| INTERSCIENCES DEVELOPMENT ASSOCIATES | | | | | | | | | | | |
| Total Awards | | | $237,328 | $262,672 | | | | | | | $500,000 |
| No. of Awards | | | 1 | 1 | | | | | | | 2 |
| Average Awards | | | $237,328 | $262,672 | | | | | | | $250,000 |
| INTERSPEC, INC. | | | | | | | | | | | |
| Total Awards | $234,350 | | | | | | | | | | $234,350 |
| No. of Awards | 1 | | | | | | | | | | 1 |
| Average Awards | $234,350 | | | | | | | | | | $234,350 |
| J. C. BLAIR MEMORIAL HOSPITAL | | | | | | | | | | | |
| Total Awards | | | $8,075 | | | | | | | | $8,075 |
| No. of Awards | | | 1 | | | | | | | | 1 |
| Average Awards | | | $8,075 | | | | | | | | $8,075 |
| JMS VISION LOSS REHABILITATION | | | | | | | | | | | |
| Total Awards | $50,000 | $49,115 | | | | | | | | | $99,115 |
| No. of Awards | 1 | 1 | | | | | | | | | 2 |
| Average Awards | $50,000 | $49,115 | | | | | | | | | $49,558 |
| JOSEPH V. LAMBERT ASSOCIATES | | | | | | | | | | | |
| Total Awards | $182,816 | | | | | | | | | | $182,816 |
| No. of Awards | 1 | | | | | | | | | | 1 |
| Average Awards | $182,816 | | | | | | | | | | $182,816 |
| JUNIATA COLLEGE | | | | | | | | | | | |
| Total Awards | | | | | | | | $33,782 | $24,972 | $26,212 | $84,966 |
| No. of Awards | | | | | | | | 1 | 1 | 1 | 3 |
| Average Awards | | | | | | | | $33,782 | $24,972 | $26,212 | $28,322 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| KDL MEDICAL TECHNOLOGIES, INC. | | | | | | | | | | | |
| Total Awards | | | | | $25,000 | | | $345,380 | $348,325 | $22,153 | $740,858 |
| No. of Awards | | | | | 1 | | | 1 | 1 | 1 | 4 |
| Average Awards | | | | | $25,000 | | | $345,380 | $348,325 | $22,153 | $185,215 |
| KESSLER COMMUNICATIONS, INC. | | | | | | | | | | | |
| Total Awards | $168,723 | $139,617 | $177,396 | $162,375 | $179,544 | | | | | | $827,655 |
| No. of Awards | 1 | 1 | 2 | 1 | 1 | | | | | | 6 |
| Average Awards | $168,723 | $139,617 | $88,698 | $162,375 | $179,544 | | | | | | $137,943 |
| KEYSTONE SCIENTIFIC, INC. | | | | | | | | | | | |
| Total Awards | | | | | | | | $98,451 | | | $98,451 |
| No. of Awards | | | | | | | | 1 | | | 1 |
| Average Awards | | | | | | | | $98,451 | | | $98,451 |
| LAKE ERIE COLLEGE/OSTEOPATHIC MEDICINE | | | | | | | | | | | |
| Total Awards | | | | | | | $29,970 | | | | $29,970 |
| No. of Awards | | | | | | | 1 | | | | 1 |
| Average Awards | | | | | | | $29,970 | | | | $29,970 |
| LANCASTER CLEFT PALATE CLINIC | | | | | | | | | | | |
| Total Awards | | | | | | $251,326 | $494,935 | $14,544 | | | $760,805 |
| No. of Awards | | | | | | 1 | 1 | 1 | | | 3 |
| Average Awards | | | | | | $251,326 | $494,935 | $14,544 | | | $253,602 |
| LANKENAU HOSPITAL | | | | | | | | | | | |
| Total Awards | $144,839 | $155,039 | $165,036 | | | $477,725 | $348,047 | $362,258 | $438,019 | $429,994 | $2,520,957 |
| No. of Awards | 1 | 1 | 1 | | | 2 | 2 | 2 | 2 | 2 | 13 |
| Average Awards | $144,839 | $155,039 | $165,036 | | | $238,863 | $174,024 | $181,129 | $219,010 | $214,997 | $193,920 |
| LANKENAU MEDICAL RESEARCH CENTER | | | | | | | | | | | |
| Total Awards | $135,255 | $779,571 | $1,614,018 | $1,421,852 | $1,534,289 | $1,094,904 | $1,315,692 | $1,578,619 | $1,729,587 | $1,908,094 | $13,111,881 |
| No. of Awards | 3 | 5 | 9 | 8 | 8 | 6 | 6 | 9 | 8 | 9 | 71 |
| Average Awards | $45,085 | $155,914 | $179,335 | $177,732 | $191,786 | $182,484 | $219,282 | $175,402 | $216,198 | $212,010 | $184,674 |
| LAUREL HIGHLANDS HEALTH SCIENCES LIBRARY | | | | | | | | | | | |
| Total Awards | | | | | | $68,279 | | | | | $68,279 |
| No. of Awards | | | | | | 1 | | | | | 1 |
| Average Awards | | | | | | $68,279 | | | | | $68,279 |
| LEHIGH UNIVERSITY | | | | | | | | | | | |
| Total Awards | $737,586 | $850,657 | $758,533 | $895,070 | $745,218 | $557,565 | $758,938 | $603,119 | $850,897 | $1,088,928 | $7,846,511 |
| No. of Awards | 10 | 10 | 8 | 8 | 8 | 6 | 7 | 5 | 6 | 7 | 75 |
| Average Awards | $73,759 | $85,066 | $94,817 | $111,884 | $93,152 | $92,928 | $108,420 | $120,624 | $141,816 | $155,561 | $104,620 |
| LIFESPAN TECHNOLOGY | | | | | | | | | | | |
| Total Awards | | | | | $49,982 | $80,994 | | | | | $130,976 |
| No. of Awards | | | | | 1 | 1 | | | | | 2 |
| Average Awards | | | | | $49,982 | $80,994 | | | | | $65,488 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| LINCOLN UNIVERSITY | | | | | | | | | | | |
| Total Awards | $357,452 | $325,705 | $160,052 | $123,820 | $154,872 | $169,292 | $132,698 | $167,610 | $224,341 | $295,227 | $2,111,069 |
| No. of Awards | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 13 |
| Average Awards | $178,726 | $162,853 | $160,052 | $123,820 | $154,872 | $169,292 | $132,698 | $167,610 | $224,341 | $147,614 | $162,390 |
| MAGAININ PHARMACEUTICALS, INC. | | | | | | | | | | | |
| Total Awards | $50,000 | $50,000 | $250,000 | $250,000 | | | | | | | $600,000 |
| No. of Awards | 1 | 1 | 1 | 1 | | | | | | | 4 |
| Average Awards | $50,000 | $50,000 | $250,000 | $250,000 | | | | | | | $150,000 |
| MAGEE-WOMEN'S HOSPITAL | | | | | | | | | | | |
| Total Awards | $1,027,872 | $946,014 | $947,245 | $1,007,467 | $1,770,357 | $2,331,458 | $4,340,292 | $4,623,459 | $7,099,255 | $8,223,367 | $32,316,786 |
| No. of Awards | 11 | 13 | 10 | 9 | 10 | 13 | 16 | 19 | 25 | 29 | 155 |
| Average Awards | $93,443 | $72,770 | $94,725 | $111,941 | $177,036 | $179,343 | $271,268 | $243,340 | $283,970 | $283,564 | $208,495 |
| MATREYA, INC. | | | | | | | | | | | |
| Total Awards | | | | $49,825 | | | | | | | $49,825 |
| No. of Awards | | | | 1 | | | | | | | 1 |
| Average Awards | | | | $49,825 | | | | | | | $49,825 |
| MEDICAL SYSTEMS ASSOCIATES, INC. | | | | | | | | | | | |
| Total Awards | | | | | | | | $192,860 | $87,502 | | $280,362 |
| No. of Awards | | | | | | | | 2 | 1 | | 3 |
| Average Awards | | | | | | | | $96,430 | $87,502 | | $93,454 |
| MEDIMATRIX, INC. | | | | | | | | | | | |
| Total Awards | $212,456 | $409,311 | | | $256,162 | $243,838 | | | | | $1,121,767 |
| No. of Awards | 2 | 2 | | | 1 | 1 | | | | | 6 |
| Average Awards | $106,228 | $204,656 | | | $256,162 | $243,838 | | | | | $186,961 |
| MELLON PITTS CORPORATION (MPC) | | | | | | | | | | | |
| Total Awards | $1,442,156 | $1,444,530 | $2,198,917 | $2,232,536 | $2,242,133 | $2,246,367 | $2,271,119 | $1,522,946 | $2,280,732 | $3,161,658 | $21,043,094 |
| No. of Awards | 2 | 2 | 4 | 4 | 5 | 5 | 3 | 4 | 3 | 5 | 37 |
| Average Awards | $721,078 | $722,265 | $549,729 | $558,134 | $448,427 | $449,273 | $757,040 | $380,737 | $760,244 | $632,332 | $568,732 |
| MERCY CATHOLIC MEDICAL CENTER | | | | | | | | | | | |
| Total Awards | $2,755,689 | $93,631 | | $167,371 | $434,286 | $233,847 | | | | | $3,684,824 |
| No. of Awards | 2 | 1 | | 1 | 1 | 1 | | | | | 6 |
| Average Awards | $1,377,845 | $93,631 | | $167,371 | $434,286 | $233,847 | | | | | $614,137 |
| MERCY HOSPITAL (SCRANTON, PA) | | | | | | | | | | | |
| Total Awards | $125,273 | | $61,970 | $140,123 | $178,408 | $213,083 | $171,447 | $157,441 | | | $1,047,745 |
| No. of Awards | 1 | | 1 | 1 | 1 | 1 | 1 | | | | 6 |
| Average Awards | $125,273 | | $61,970 | $140,123 | $178,408 | $213,083 | $171,447 | | | | $174,624 |
| MERCY HOSPITAL OF PITTSBURGH | | | | | | | | | | | |
| Total Awards | | | | $74,359 | $78,817 | $83,539 | $169,622 | $139,098 | $145,494 | $496,989 | $1,187,918 |
| No. of Awards | | | | 1 | 1 | 1 | 2 | 1 | 2 | 3 | 11 |
| Average Awards | | | | $74,359 | $78,817 | $83,539 | $84,811 | $139,098 | $72,747 | $165,663 | $107,993 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MESSAGE PHARMACEUTICALS, INC. | | | | | | | | | | | |
| Total Awards | | | | | | | | | | $312,120 | $312,120 |
| No. of Awards | | | | | | | | | | 1 | 1 |
| Av erage Awards | | | | | | | | | | $312,120 | $312,120 |
| METAMORPHIC SURGICAL DEVICES | | | | | | | | | | | |
| Total Awards | | | | | | | | $100,000 | | $371,456 | $471,456 |
| No. of Awards | | | | | | | | 1 | | 1 | 2 |
| Average Awards | | | | | | | | $100,000 | | $371,456 | $235,728 |
| MICROSIGNAL CORPORATION | | | | | | | | | | | |
| Total Awards | | | | | | $45,762 | | | | | $45,762 |
| No. of Awards | | | | | | 1 | | | | | 1 |
| Average Awards | | | | | | $45,762 | | | | | $45,762 |
| MOBERG MEDICAL, INC. | | | | | | | | | | | |
| Total Awards | | | | | $50,000 | $100,000 | $100,000 | $547,136 | $296,935 | | $1,094,071 |
| No. of Awards | | | | | 1 | 1 | 1 | 2 | 1 | | 6 |
| Average Awards | | | | | $50,000 | $100,000 | $100,000 | $273,568 | $296,935 | | $182,345 |
| MOBERG RESEARCH, INC. | | | | | | | | | | | |
| Total Awards | | | | | | | | | | $358,719 | $358,719 |
| No. of Awards | | | | | | | | | | 2 | 2 |
| Average Awards | | | | | | | | | | $179,360 | $179,360 |
| MOLECULAR TARGETING TECHNOLOGY, INC. | | | | | | | | | | | |
| Total Awards | | | | | | | $98,500 | | | $100,000 | $198,500 |
| No. of Awards | | | | | | | 1 | | | 1 | 2 |
| Average Awards | | | | | | | $98,500 | | | $100,000 | $99,250 |
| MONELL CHEMICAL SENSES CENTER | | | | | | | | | | | |
| Total Awards | $2,771,686 | $3,174,982 | $3,298,611 | $3,286,877 | $4,185,866 | $3,967,340 | $3,567,234 | $3,453,454 | $3,275,452 | $3,709,571 | $34,691,073 |
| No. of Awards | 22 | 24 | 24 | 23 | 27 | 23 | 21 | 22 | 20 | 21 | 227 |
| Average Awards | $125,986 | $132,291 | $137,442 | $142,908 | $155,032 | $172,493 | $169,868 | $156,975 | $163,773 | $176,646 | $152,824 |
| MONITEC, INC. | | | | | | | | | | | |
| Total Awards | | | | | | | | $100,000 | | | $100,000 |
| No. of Awards | | | | | | | | 1 | | | 1 |
| Average Awards | | | | | | | | $100,000 | | | $100,000 |
| MONTEFIORE UNIVERSITY HOSPITAL | | | | | | | | | | | |
| Total Awards | $1,025,464 | $649,070 | $1,434,230 | $156,420 | $112,420 | $17,551 | | | | | $3,395,155 |
| No. of Awards | 8 | 8 | 12 | 4 | 1 | 1 | | | | | 34 |
| Average Awards | $128,183 | $81,134 | $119,519 | $39,105 | $112,420 | $17,551 | | | | | $99,858 |
| MOSS REHABILITATION HOSPITAL | | | | | | | | | | | |
| Total Awards | $54,000 | $67,500 | $139,462 | $489,134 | $813,478 | $863,373 | $976,834 | $1,031,535 | $681,343 | $824,122 | $5,940,781 |
| No. of Awards | 1 | 1 | 2 | 3 | 5 | 5 | 4 | 3 | 3 | 5 | 32 |
| Average Awards | $54,000 | $67,500 | $69,731 | $163,045 | $162,696 | $172,675 | $244,209 | $343,845 | $227,114 | $164,824 | $185,649 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| NATIONAL DISEASE RESEARCH INTERCHANGE | | | | | | | | | | | |
| Total Awards | $1,145,032 | $1,814,604 | $1,742,115 | $1,707,462 | $1,496,351 | $1,462,722 | $1,501,703 | $1,324,545 | $633,176 | $567,295 | $13,395,005 |
| No. of Awards | 2 | 3 | 2 | 3 | 2 | 1 | 2 | 2 | 1 | | 18 |
| Average Awards | $572,516 | $604,868 | $871,058 | $569,154 | $748,176 | $1,462,722 | $750,852 | $662,273 | $633,176 | | $744,167 |
| NATIONAL UNDERGROUND STORAGE | | | | | | | | | | | |
| Total Awards | $24,172 | $16,254 | $16,253 | $16,286 | $33,225 | $50,035 | $66,794 | $60,039 | $77,586 | $76,790 | $437,434 |
| No. of Awards | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 15 |
| Average Awards | $24,172 | $16,254 | $16,253 | $16,286 | $33,225 | $25,018 | $33,397 | $30,020 | $38,793 | $38,395 | $29,162 |
| NEO GEN SCREENING, INC. | | | | | | | | | | | |
| Total Awards | | | | | | | | $90,037 | $84,670 | $341,573 | $516,280 |
| No. of Awards | | | | | | | | 1 | 1 | 1 | 3 |
| Average Awards | | | | | | | | $90,037 | $84,670 | $341,573 | $172,093 |
| NIM, INC. | | | | | | | | | | | |
| Total Awards | $233,592 | $366,408 | $323,576 | $276,424 | | $230,875 | $895,704 | $704,271 | $351,483 | $372,836 | $3,755,169 |
| No. of Awards | 1 | 3 | 1 | 3 | | 3 | 3 | 2 | 1 | 1 | 18 |
| Average Awards | $233,592 | $122,136 | $323,576 | $92,141 | | $76,958 | $298,568 | $352,136 | $351,483 | $372,836 | $208,621 |
| ONCOLOGY NURSING SOCIETY | | | | | | | | | | | |
| Total Awards | $300,556 | $197,949 | $27,486 | $58,452 | $150,508 | $94,037 | | | $277,148 | $283,237 | $1,389,373 |
| No. of Awards | 2 | 2 | 1 | 2 | 2 | 2 | | | 2 | 2 | 15 |
| Average Awards | $150,278 | $98,975 | $27,486 | $29,226 | $75,254 | $47,019 | | | $138,574 | $141,619 | $92,625 |
| OPTICAL DEVICES, INC. | | | | | | | | | | | |
| Total Awards | | | | | | | | | | $99,980 | $99,980 |
| No. of Awards | | | | | | | | | | 1 | 1 |
| Average Awards | | | | | | | | | | $99,980 | $99,980 |
| ORNITHINE DECARBOXYLASE(ODC)MOUSE GROUP | | | | | | | | | | | |
| Total Awards | | | | | | | | | | $100,000 | $100,000 |
| No. of Awards | | | | | | | | | | 1 | 1 |
| Average Awards | | | | | | | | | | $100,000 | $100,000 |
| OTSUKA ELECTRONICS, USA | | | | | | | | | | | |
| Total Awards | $290,935 | | | | | | | | | | $290,935 |
| No. of Awards | 1 | | | | | | | | | | 1 |
| Average Awards | $290,935 | | | | | | | | | | $290,935 |
| PENNSYLVANIA COLLEGE OF OPTOMETRY | | | | | | | | | | | |
| Total Awards | $234,008 | $451,013 | $403,761 | $269,837 | $442,087 | $648,297 | $545,627 | $98,926 | $269,577 | $620,781 | $3,983,914 |
| No. of Awards | 4 | 5 | 6 | 5 | 5 | 5 | 3 | 1 | 2 | 4 | 40 |
| Average Awards | $58,502 | $90,203 | $67,294 | $53,967 | $88,417 | $129,659 | $181,876 | $98,926 | $134,789 | $155,195 | $99,598 |
| PENNSYLVANIA COLLEGE OF PODIATRIC MED | | | | | | | | | | | |
| Total Awards | | | | $11,939 | | | | $29,594 | | | $41,533 |
| No. of Awards | | | | 1 | | | | 1 | | | 2 |
| Average Awards | | | | $11,939 | | | | $29,594 | | | $20,767 |

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|---|---|---|---|---|---|---|---|---|---|---|---|
| PENNSYLVANIA HOSPITAL (PHILADELPHIA) | | | | | | | | | | | |
| Total Awards | $971,369 | $802,033 | $850,150 | $612,824 | $640,694 | | | | | | $3,877,070 |
| No. of Awards | 5 | 4 | 2 | 1 | 1 | | | | | | 13 |
| Average Awards | $194,274 | $200,508 | $425,075 | $612,824 | $640,694 | | | | | | $298,236 |
| PENNSYLVANIA OFFICE OF MENTAL HEALTH | | | | | | | | | | | |
| Total Awards | | $294,801 | $347,213 | $683,814 | | | | | | | $1,325,828 |
| No. of Awards | | 1 | 1 | 2 | | | | | | | 4 |
| Average Awards | | $294,801 | $347,213 | $341,907 | | | | | | | $331,457 |
| PENNSYLVANIA STATE DEPT OF HEALTH | | | | | | | | | | | |
| Total Awards | $337,142 | $213,939 | $368,773 | $470,728 | $166,416 | $19,341 | $19,117 | | | | $1,595,456 |
| No. of Awards | 2 | 1 | 2 | 2 | 1 | 1 | 1 | | | | 10 |
| Average Awards | $168,571 | $213,939 | $184,387 | $235,364 | $166,416 | $19,341 | $19,117 | | | | $159,546 |
| PENNSYLVANIA STATE DEPT OF PUBL WELFARE | | | | | | | | | | | |
| Total Awards | $461,211 | $452,599 | $463,392 | $23,594 | | | $61,099 | | | | $1,461,895 |
| No. of Awards | 2 | 2 | 2 | | | | 1 | | | | 7 |
| Average Awards | $230,606 | $226,300 | $231,696 | | | | $61,099 | | | | $208,842 |
| PENNSYLVANIA STATE UNIV HERSHEY MED CTR | | | | | | | | | | | |
| Total Awards | $15,866,443 | $18,269,365 | $19,688,414 | $23,714,577 | $23,323,978 | $23,466,104 | $25,374,662 | $30,336,312 | $27,519,635 | $30,001,698 | $237,561,188 |
| No. of Awards | 90 | 93 | 103 | 109 | 109 | 103 | 110 | 116 | 129 | 131 | 1093 |
| Average Awards | $176,294 | $196,445 | $191,150 | $217,565 | $213,981 | $227,826 | $230,679 | $261,520 | $213,331 | $229,021 | $217,348 |
| PENNSYLVANIA STATE UNIVERSITY-UNIV PARK | | | | | | | | | | | |
| Total Awards | $11,978,278 | $14,259,552 | $16,209,412 | $19,015,989 | $18,475,010 | $21,892,718 | $23,151,834 | $25,659,637 | $29,476,502 | $29,608,116 | $209,727,048 |
| No. of Awards | 98 | 100 | 111 | 115 | 104 | 125 | 129 | 129 | 139 | 141 | 1191 |
| Average Awards | $122,227 | $142,596 | $146,031 | $165,356 | $177,644 | $175,142 | $179,472 | $198,912 | $212,061 | $209,987 | $176,093 |
| PHILADELPHIA BIOMEDICAL RESEARCH INST | | | | | | | | | | | |
| Total Awards | | $104,372 | | $183,213 | $160,650 | $131,974 | | | | | $580,209 |
| No. of Awards | | 1 | | 1 | 1 | 1 | | | | | 4 |
| Average Awards | | $104,372 | | $183,213 | $160,650 | $131,974 | | | | | $145,052 |
| PHILADELPHIA CHILD GUIDANCE CLINIC | | | | | | | | | | | |
| Total Awards | | | | | | $81,936 | $93,420 | | $105,352 | $126,672 | $407,380 |
| No. of Awards | | | | | | 1 | 1 | | 1 | 1 | 4 |
| Average Awards | | | | | | $81,936 | $93,420 | | $105,352 | $126,672 | $101,845 |
| PHILADELPHIA COLLEGE OF OSTEOPATHIC MED | | | | | | | | | | | |
| Total Awards | | $73,859 | $101,880 | $104,491 | | | $169,504 | $69,464 | $86,333 | $199,586 | $805,117 |
| No. of Awards | | 1 | 2 | 1 | | | 3 | 2 | 1 | 2 | 12 |
| Average Awards | | $73,859 | $50,940 | $104,491 | | | $56,501 | $34,732 | $86,333 | $99,793 | $67,093 |
| PHILADELPHIA FIGHT | | | | | | | | | | | |
| Total Awards | | | | | | $486,262 | $766,991 | $343,042 | $792,248 | $823,938 | $3,212,481 |
| No. of Awards | | | | | | 1 | 1 | 1 | 1 | 1 | 5 |
| Average Awards | | | | | | $486,262 | $766,991 | $343,042 | $792,248 | $823,938 | $642,496 |

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|---|---|---|---|---|---|---|---|---|---|---|---|
| PHILADELPHIA GERIATRIC CTR-FRIEDMAN HOSP | | | | | | | | | | | |
| Total Awards | $3,624,174 | $2,176,547 | $2,619,541 | $3,254,416 | $2,338,495 | $2,235,581 | $2,214,472 | $2,114,505 | $1,016,556 | $419,703 | $22,013,990 |
| No. of Awards | 7 | 8 | 11 | 13 | 12 | 11 | 9 | 10 | 6 | 2 | 89 |
| Average Awards | $517,739 | $272,068 | $238,140 | $250,340 | $194,875 | $203,235 | $246,052 | $211,451 | $169,426 | $209,852 | $247,348 |
| PHILADELPHIA HEALTH MANAGEMENT CORP | | | | | | | | | | | |
| Total Awards | $1,142,848 | $785,234 | $1,185,056 | $1,284,355 | $1,237,782 | $1,028,196 | | | | | $6,663,471 |
| No. of Awards | 1 | 2 | 2 | 2 | 2 | 2 | | | | | 11 |
| Average Awards | $1,142,848 | $392,617 | $592,528 | $642,178 | $618,891 | $514,098 | | | | | $605,770 |
| POLYPROBE, INC. | | | | | | | | | | | |
| Total Awards | | | | | $34,010 | | | $182,780 | $281,900 | | $498,690 |
| No. of Awards | | | | | 1 | | | 1 | 1 | | 3 |
| Average Awards | | | | | $34,010 | | | $182,780 | $281,900 | | $166,230 |
| POLYSCIENCES, INC. | | | | | | | | | | | |
| Total Awards | $361,055 | $6,618 | | $57,214 | | | | | | | $424,887 |
| No. of Awards | 2 | 1 | | 1 | | | | | | | 4 |
| Average Awards | $180,528 | $6,618 | | $57,214 | | | | | | | $106,222 |
| PRESBYTERIAN MEDICAL CENTER OF PHILA | | | | | | | | | | | |
| Total Awards | $1,473,008 | $824,878 | $964,832 | $790,454 | $988,604 | $723,255 | $1,212,317 | $192,553 | | | $7,169,901 |
| No. of Awards | 11 | 8 | 7 | 5 | 4 | 6 | 6 | 2 | | | 49 |
| Average Awards | $133,910 | $103,110 | $137,833 | $158,091 | $247,151 | $120,543 | $202,053 | $96,277 | | | $146,325 |
| PRESERVATION RESOURCES | | | | | | | | | | | |
| Total Awards | | $79,076 | | | | | $334,847 | $550,977 | $813,736 | $590,875 | $2,369,511 |
| No. of Awards | | 1 | | | | | 1 | 1 | 1 | 1 | 5 |
| Average Awards | | $79,076 | | | | | $334,847 | $550,977 | $813,736 | $590,875 | $473,902 |
| PREVENTIVE MEDICAL TECHNOLOGIES, INC. | | | | | | | | | | | |
| Total Awards | | | | | | | | | | $99,942 | $99,942 |
| No. of Awards | | | | | | | | | | 1 | 1 |
| Average Awards | | | | | | | | | | $99,942 | $99,942 |
| PROLX PHARMACEUTICALS, INC. | | | | | | | | | | | |
| Total Awards | | | | | | | | | $100,000 | $198,000 | $298,000 |
| No. of Awards | | | | | | | | | 1 | 1 | 2 |
| Average Awards | | | | | | | | | $100,000 | $198,000 | $149,000 |
| PROVAC, INC. | | | | | | | | | | | |
| Total Awards | | $50,000 | | | | | | | | | $50,000 |
| No. of Awards | | 1 | | | | | | | | | 1 |
| Average Awards | | $50,000 | | | | | | | | | $50,000 |
| PSYCHOLOGY SOFTWARE TOOLS, INC. | | | | | | | | | | | |
| Total Awards | | | | | $49,118 | | | | $99,994 | $471,860 | $620,972 |
| No. of Awards | | | | | 1 | | | | 1 | 2 | 4 |
| Average Awards | | | | | $49,118 | | | | $99,994 | $235,930 | $155,243 |

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|---|---|---|---|---|---|---|---|---|
| PUBLIC/PRIVATE VENTURES | | | | | | | | |
| Total Awards | | | | $90,585 | | | | $90,585 |
| No. of Awards | | | | 1 | | | | 1 |
| Average Awards | | | | $90,585 | | | | $90,585 |
| PURESYN, INC. | | | | | | | | |
| Total Awards | | | | | | $96,600 | | $96,600 |
| No. of Awards | | | | | | 1 | | 1 |
| Average Awards | | | | | | $96,600 | | $96,600 |
| Q-CHEM, INC. | | | | | | | | |
| Total Awards | | | | | | | $138,697 | $138,697 |
| No. of Awards | | | | | | | 1 | 1 |
| Average Awards | | | | | | | $138,697 | $138,697 |
| QDOT CORPORATION | | | | | | | | |
| Total Awards | | | | | | $99,996 | | $99,996 |
| No. of Awards | | | | | | 1 | | 1 |
| Average Awards | | | | | | $99,996 | | $99,996 |
| QED COMMUNICATIONS, INC. | | | | | | | | |
| Total Awards | | | $187,909 | $194,778 | | | | $382,687 |
| No. of Awards | | | 1 | 1 | | | | 2 |
| Average Awards | | | $187,909 | $194,778 | | | | $191,344 |
| QED IMAGING, INC. | | | | | | | | |
| Total Awards | | | | | | | $99,801 | $99,801 |
| No. of Awards | | | | | | | 1 | 1 |
| Average Awards | | | | | | | $99,801 | $99,801 |
| RJ LEE GROUP | | | | | | | | |
| Total Awards | $349,595 | $200,405 | | | | | | $550,000 |
| No. of Awards | 2 | 1 | | | | | | 3 |
| Average Awards | $174,798 | $200,405 | | | | | | $183,333 |
| ROBERT PACKER HOSPITAL | | | | | | | | |
| Total Awards | | | $103,572 | $89,642 | | | | $193,214 |
| No. of Awards | | | 1 | 1 | | | | 2 |
| Average Awards | | | $103,572 | $89,642 | | | | $96,607 |
| SACRED HEART HOSPITAL | | | | | | | | |
| Total Awards | | | $11,315 | | | | | $11,315 |
| No. of Awards | | | 1 | | | | | 1 |
| Average Awards | | | $11,315 | | | | | $11,315 |
| SEER SYSTEMS, INC. | | | | | | | | |
| Total Awards | | | | | $99,562 | | | $99,562 |
| No. of Awards | | | | | 1 | | | 1 |
| Average Awards | | | | | $99,562 | | | $99,562 |

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|---|---|---|---|---|---|---|---|---|---|---|---|
| SERVICEWARE, INC. | | | | | | | | | | | |
| Total Awards | | | | | | | $74,928 | | | | $74,928 |
| No. of Awards | | | | | | | 1 | | | | 1 |
| Average Awards | | | | | | | $74,928 | | | | $74,928 |
| SHIPPENSBURG UNIVERSITY OF PENNSYLVANIA | | | | | | | | | | | |
| Total Awards | | | | $102,955 | | | | | | $10,000 | $112,955 |
| No. of Awards | | | | 1 | | | | | | 1 | 2 |
| Average Awards | | | | $102,955 | | | | | | $10,000 | $56,478 |
| SMITHKLINE BEECHAM PHARMACEUTICALS | | | | | | | | | | | |
| Total Awards | | | $85,717 | $128,038 | | $148,365 | $154,300 | $259,043 | $307,029 | | $1,082,492 |
| No. of Awards | | | 1 | 1 | | 1 | 1 | 2 | 2 | | 8 |
| Average Awards | | | $85,717 | $128,038 | | $148,365 | $154,300 | $129,522 | $153,515 | | $135,312 |
| SMITHKLINE BEECHAM, PLC | | | | | | | | | | | |
| Total Awards | $260,173 | | $877,288 | | | | | | | | $1,137,461 |
| No. of Awards | 1 | | 2 | | | | | | | | 3 |
| Average Awards | $260,173 | | $438,644 | | | | | | | | $379,154 |
| SONIC TECHNOLOGIES | | | | | | | | | | | |
| Total Awards | | $48,595 | $48,768 | $50,000 | $198,950 | $102,917 | $267,138 | $261,681 | | | $978,049 |
| No. of Awards | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | 7 |
| Average Awards | | $48,595 | $48,768 | $50,000 | $198,950 | $102,917 | $267,138 | $261,681 | | | $139,721 |
| SPARTA PHARMACEUTICAL CORPORATION | | | | | | | | | | | |
| Total Awards | | | | | | $82,875 | $184,739 | $85,435 | $421,443 | $431,513 | $1,206,005 |
| No. of Awards | | | | | | 1 | 2 | 1 | 1 | 2 | 7 |
| Average Awards | | | | | | $82,875 | $92,370 | $85,435 | $421,443 | $215,757 | $172,286 |
| SPECTRASONICS IMAGING | | | | | | | | | | | |
| Total Awards | | | | | | | $98,032 | | $400,875 | $414,086 | $912,993 |
| No. of Awards | | | | | | | 1 | | 1 | 2 | 4 |
| Average Awards | | | | | | | $98,032 | | $400,875 | $207,043 | $228,248 |
| ST. JOSEPH'S UNIVERSITY | | | | | | | | | | | |
| Total Awards | $112,271 | | | $111,545 | | | $215,239 | | | | $439,055 |
| No. of Awards | 1 | | | 1 | | | 2 | | | | 4 |
| Average Awards | $112,271 | | | $111,545 | | | $107,620 | | | | $109,764 |
| ST. PETER'S CHILD DEVELOPMENT CENTERS | | | | | | | | | | | |
| Total Awards | | | | | | $176,015 | | | | | $176,015 |
| No. of Awards | | | | | | 1 | | | | | 1 |
| Average Awards | | | | | | $176,015 | | | | | $176,015 |
| STC TECHNOLOGIES, INC. | | | | | | | | | | | |
| Total Awards | | | | | | | | | $100,000 | | $100,000 |
| No. of Awards | | | | | | | | | 1 | | 1 |
| Average Awards | | | | | | | | | $100,000 | | $100,000 |

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|---|---|---|---|---|---|---|---|---|---|---|---|
| STEMCELL THERAPEUTICS, LLC | | | | | | | | | | | |
| Total Awards | | | | | | | | | $99,326 | | $99,326 |
| No. of Awards | | | | | | | | | 1 | | 1 |
| Average Awards | | | | | | | | | $99,326 | | $99,326 |
| STONY BROOK SCIENTIFIC, LTD. | | | | | | | | | | | |
| Total Awards | | | | $50,000 | | | | | | | $50,000 |
| No. of Awards | | | | 1 | | | | | | | 1 |
| Average Awards | | | | $50,000 | | | | | | | $50,000 |
| SUSQUEHANNA HEALTH SYSTEM | | | | | | | | | | | |
| Total Awards | | | | | | | | $50,000 | | | $50,000 |
| No. of Awards | | | | | | | | 1 | | | 1 |
| Average Awards | | | | | | | | $50,000 | | | $50,000 |
| SUSQUEHANNA UNIVERSITY | | | | | | | | | | | |
| Total Awards | | | | | $114,831 | | | $104,287 | $137,810 | $33,700 | $390,628 |
| No. of Awards | | | | | 1 | | | 1 | 2 | 1 | 5 |
| Average Awards | | | | | $114,831 | | | $104,287 | $68,905 | $33,700 | $78,126 |
| SWARTHMORE COLLEGE | | | | | | | | | | | |
| Total Awards | | | $229,430 | | | | | $110,520 | | $105,003 | $444,953 |
| No. of Awards | | | 2 | | | | | 1 | | 1 | 4 |
| Average Awards | | | $114,715 | | | | | $110,520 | | $105,003 | $111,238 |
| SWETS SUBSCRIPTION SERVICE | | | | | | | | | | | |
| Total Awards | | | | | | | | | $55,812 | $1,480,000 | $1,535,812 |
| No. of Awards | | | | | | | | | 1 | 1 | 2 |
| Average Awards | | | | | | | | | $55,812 | $1,480,000 | $767,906 |
| SYMPOSIA, INC. | | | | | | | | | | | |
| Total Awards | | | $49,470 | | | | | | | | $49,470 |
| No. of Awards | | | 1 | | | | | | | | 1 |
| Average Awards | | | $49,470 | | | | | | | | $49,470 |
| SYNCHROTRONICS, INC. | | | | | | | | | | | |
| Total Awards | | $191,902 | $50,000 | | | | | | | | $241,902 |
| No. of Awards | | 1 | 1 | | | | | | | | 2 |
| Average Awards | | $191,902 | $50,000 | | | | | | | | $120,951 |
| TELEFACTOR CORPORATION | | | | | | | | | | | |
| Total Awards | $50,000 | | | $49,978 | $50,000 | $325,556 | $602,966 | $823,566 | $476,760 | $99,688 | $2,478,514 |
| No. of Awards | 1 | | | 1 | 1 | 2 | 2 | 3 | 2 | 1 | 13 |
| Average Awards | $50,000 | | | $49,978 | $50,000 | $162,778 | $301,483 | $274,522 | $238,380 | $99,688 | $190,655 |
| TELEGRAPHIQUES | | | | | | | | | | | |
| Total Awards | | $50,000 | | | | | | | | | $50,000 |
| No. of Awards | | 1 | | | | | | | | | 1 |
| Average Awards | | $50,000 | | | | | | | | | $50,000 |

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|---|---|---|---|---|---|---|---|---|---|---|---|
| TEMPLE UNIVERSITY | | | | | | | | | | | |
| Total Awards | $19,551,969 | $23,252,596 | $19,066,502 | $20,991,097 | $21,225,949 | $22,533,173 | $22,592,250 | $20,577,828 | $21,680,215 | $23,834,494 | $215,306,073 |
| No. of Awards | 114 | 116 | 102 | 96 | 93 | 97 | 99 | 97 | 97 | 95 | 1006 |
| Average Awards | $171,509 | $200,453 | $186,926 | $218,657 | $228,236 | $232,301 | $228,205 | $212,143 | $223,507 | $250,889 | $214,022 |
| THAR DESIGNS, INC. | | | | | | | | | | | |
| Total Awards | | | | | | $72,150 | | | | | $72,150 |
| No. of Awards | | | | | | 1 | | | | | 1 |
| Average Awards | | | | | | $72,150 | | | | | $72,150 |
| THERACHEM RESEARCH | | | | | | | | | | | |
| Total Awards | | | | | | | | | $100,000 | | $100,000 |
| No. of Awards | | | | | | | | | 1 | | 1 |
| Average Awards | | | | | | | | | $100,000 | | $100,000 |
| THOMAS JEFFERSON UNIVERSITY | | | | | | | | | | | |
| Total Awards | $19,313,554 | $18,706,814 | $25,797,111 | $32,171,363 | $37,741,516 | $44,217,888 | $48,462,145 | $50,538,675 | $50,406,358 | $55,683,204 | $383,038,628 |
| No. of Awards | 108 | 103 | 126 | 152 | 159 | 185 | 193 | 193 | 203 | 211 | 1633 |
| Average Awards | $178,829 | $181,620 | $204,739 | $211,654 | $237,368 | $239,016 | $251,099 | $261,858 | $248,307 | $263,901 | $234,561 |
| THREE-DIMENSIONAL PHARMACEUTICALS, INC. | | | | | | | | | | | |
| Total Awards | | | | | | | $176,549 | $375,000 | $375,000 | | $926,549 |
| No. of Awards | | | | | | | 2 | 1 | 1 | | 4 |
| Average Awards | | | | | | | $88,275 | $375,000 | $375,000 | | $231,637 |
| TOTTS GAP MEDICAL RESEARCH LABORATORIES | | | | | | | | | | | |
| Total Awards | | | | | $183,551 | | | $189,566 | | | $373,117 |
| No. of Awards | | | | | 1 | | | 1 | | | 2 |
| Average Awards | | | | | $183,551 | | | $189,566 | | | $186,559 |
| TRANSICOIL, INC. | | | | | | | | | | | |
| Total Awards | | | | | | | $1,164,997 | $1,467,689 | $1,620,966 | $868,291 | $5,121,943 |
| No. of Awards | | | | | | | 1 | 1 | 1 | 1 | 4 |
| Average Awards | | | | | | | $1,164,997 | $1,467,689 | $1,620,966 | $868,291 | $1,280,486 |
| U.S. BIOSCIENCE, INC. | | | | | | | | | | | |
| Total Awards | | | | | | | | | $368,851 | $383,585 | $752,436 |
| No. of Awards | | | | | | | | | 1 | 1 | 2 |
| Average Awards | | | | | | | | | $368,851 | $383,585 | $376,218 |
| UGM LABORATORY, INC. | | | | | | | | | | | |
| Total Awards | | | | | | | $80,440 | | | | $80,440 |
| No. of Awards | | | | | | | 1 | | | | 1 |
| Average Awards | | | | | | | $80,440 | | | | $80,440 |
| UGM MEDICAL SYSTEMS, INC. | | | | | | | | | | | |
| Total Awards | | $302,857 | $497,140 | $250,000 | $50,000 | $75,000 | $269,998 | $247,263 | | | $1,692,258 |
| No. of Awards | | 2 | 2 | 1 | 1 | 1 | 1 | 1 | | | 9 |
| Average Awards | | $151,429 | $248,570 | $250,000 | $50,000 | $75,000 | $269,998 | $247,263 | | | $188,029 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ULTRA VOICE | | | | | | | | | | | |
| Total Awards | | | $50,000 | | | | $265,000 | $225,000 | | | $540,000 |
| No. of Awards | | | 1 | | | | 1 | 1 | | | 3 |
| Average Awards | | | $50,000 | | | | $265,000 | $225,000 | | | $180,000 |
| UNISYS | | | | | | | | | | | |
| Total Awards | $325,413 | $347,836 | | | | | $268,744 | $201,978 | $213,837 | | $1,357,808 |
| No. of Awards | 1 | 1 | | | | | 1 | 1 | 1 | | 5 |
| Average Awards | $325,413 | $347,836 | | | | | $268,744 | $201,978 | $213,837 | | $271,562 |
| UNIVERSITY CITY SCIENCE CENTER | | | | | | | | | | | |
| Total Awards | $5,119,938 | $3,630,522 | $3,360,164 | $3,171,329 | $3,242,887 | $1,713,543 | $1,881,610 | $1,437,890 | $555,776 | $675,329 | $24,788,988 |
| No. of Awards | 19 | 14 | 13 | 8 | 9 | 7 | 6 | 3 | 4 | 4 | 87 |
| Average Awards | $269,470 | $259,323 | $258,474 | $396,416 | $360,321 | $244,792 | $313,602 | $479,297 | $138,944 | $168,832 | $284,931 |
| UNIVERSITY OF PENNSYLVANIA | | | | | | | | | | | |
| Total Awards | $109,314,170 | $118,917,466 | $133,255,054 | $142,354,728 | $146,907,446 | $158,798,854 | $174,278,318 | $186,727,955 | $217,069,896 | $246,152,782 | $1,633,776,669 |
| No. of Awards | 515 | 555 | 592 | 583 | 597 | 661 | 696 | 738 | 782 | 861 | 6580 |
| Average Awards | $212,261 | $214,266 | $225,093 | $244,176 | $246,076 | $240,240 | $250,400 | $253,019 | $277,583 | $285,892 | $248,294 |
| UNIVERSITY OF PITTSBURGH AT PITTSBURGH | | | | | | | | | | | |
| Total Awards | $75,815,096 | $87,085,688 | $103,578,913 | $127,290,704 | $127,838,294 | $126,045,775 | $140,126,377 | $136,204,607 | $151,872,229 | $169,042,416 | $1,244,900,099 |
| No. of Awards | 377 | 385 | 442 | 469 | 460 | 495 | 506 | 532 | 546 | 580 | 4792 |
| Average Awards | $201,101 | $226,197 | $234,341 | $271,409 | $277,909 | $254,638 | $276,930 | $256,024 | $278,154 | $291,452 | $259,787 |
| UNIVERSITY OF SCRANTON | | | | | | | | | | | |
| Total Awards | | | | $100,243 | | | | | $134,531 | | $234,774 |
| No. of Awards | | | | 1 | | | | | 1 | | 2 |
| Average Awards | | | | $100,243 | | | | | $134,531 | | $117,387 |
| UNIVERSITY OF THE SCIENCES PHILADELPHIA | | | | | | | | | | | |
| Total Awards | $360,675 | $313,543 | $273,012 | $83,409 | $85,903 | $437,346 | $396,233 | $228,051 | $181,615 | $292,444 | $2,652,231 |
| No. of Awards | 3 | 3 | 3 | 1 | 1 | 4 | 4 | 3 | 2 | 3 | 27 |
| Average Awards | $120,225 | $104,514 | $91,004 | $83,409 | $85,903 | $109,337 | $99,058 | $76,017 | $90,808 | $97,481 | $98,231 |
| VILLANOVA UNIVERSITY | | | | | | | | | | | |
| Total Awards | $337,595 | $472,625 | $281,848 | $292,979 | $286,745 | $285,392 | $184,103 | $103,866 | | $121,781 | $2,366,934 |
| No. of Awards | 5 | 6 | 5 | 4 | 3 | 2 | 1 | 1 | | 1 | 28 |
| Average Awards | $67,519 | $78,771 | $56,370 | $73,245 | $95,582 | $142,696 | $184,103 | $103,866 | | $121,781 | $84,533 |
| VIRAL THERAPEUTICS, INC. | | | | | | | | | | | |
| Total Awards | | | | | | | | $80,995 | | | $80,995 |
| No. of Awards | | | | | | | | 1 | | | 1 |
| Average Awards | | | | | | | | $80,995 | | | $80,995 |
| VIROPHARMA, INC. | | | | | | | | | | | |
| Total Awards | | | | | | | $90,813 | $92,881 | | | $183,694 |
| No. of Awards | | | | | | | 1 | 1 | | | 2 |
| Average Awards | | | | | | | $90,813 | $92,881 | | | $91,847 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VISITING NURSES ASSOCIATION SRVS & FDN | | | | | | | | | | | |
| Total Awards | | | | | | | | | | $29,783 | $29,783 |
| No. of Awards | | | | | | | | | | 1 | 1 |
| Average Awards | | | | | | | | | | $29,783 | $29,783 |
| WALTERS SCIENTIFIC INSTRUMENT LABS | | | | | | | | | | | |
| Total Awards | | | | | | $216,981 | $252,700 | | | | $469,681 |
| No. of Awards | | | | | | 1 | 1 | | | | 2 |
| Average Awards | | | | | | $216,981 | $252,700 | | | | $234,841 |
| WEIS CENTER FOR RESEARCH-GEISINGER CLNIC | | | | | | | | | | | |
| Total Awards | $112,440 | $371,841 | $891,858 | $1,571,619 | $2,836,872 | $2,802,427 | $2,829,431 | $2,035,135 | $1,181,976 | $238,295 | $14,871,894 |
| No. of Awards | 1 | 3 | 7 | 11 | 18 | 18 | 16 | 14 | 8 | 1 | 97 |
| Average Awards | $112,440 | $123,947 | $127,408 | $142,874 | $157,604 | $155,690 | $176,839 | $145,367 | $147,747 | $238,295 | $153,318 |
| WEST CHESTER UNIVERSITY OF PENNSYLVANIA | | | | | | | | | | | |
| Total Awards | $112,380 | | | $100,000 | $103,372 | | | | | | $315,752 |
| No. of Awards | 1 | | | 1 | 1 | | | | | | 3 |
| Average Awards | $112,380 | | | $100,000 | $103,372 | | | | | | $105,251 |
| WESTERN PENNSYLVANIA HOSPITAL | | | | | | | | | | | |
| Total Awards | | $200,453 | $262,574 | $276,535 | $296,874 | | | | | | $1,036,436 |
| No. of Awards | | 1 | 1 | 1 | 1 | | | | | | 4 |
| Average Awards | | $200,453 | $262,574 | $276,535 | $296,874 | | | | | | $259,109 |
| WIDENER UNIVERSITY PENNYSLVANIA CAMPUS | | | | | | | | | | | |
| Total Awards | | | $77,727 | | | | | | | | $77,727 |
| No. of Awards | | | 1 | | | | | | | | 1 |
| Average Awards | | | $77,727 | | | | | | | | $77,727 |
| WILHELMY FINE PARTICLES | | | | | | | | | | | |
| Total Awards | | | | $47,625 | | | | | | | $47,625 |
| No. of Awards | | | | 1 | | | | | | | 1 |
| Average Awards | | | | $47,625 | | | | | | | $47,625 |
| WILLS EYE HOSPITAL (PHILADELPHIA) | | | | | | | | | | | |
| Total Awards | $692,912 | $378,571 | $376,001 | $157,242 | $216,308 | $244,324 | $401,790 | $311,697 | $173,845 | $162,981 | $3,115,671 |
| No. of Awards | 10 | 6 | 6 | 2 | 3 | 4 | 4 | 3 | 2 | 2 | 42 |
| Average Awards | $69,291 | $63,095 | $62,667 | $78,621 | $72,103 | $61,081 | $100,448 | $103,899 | $86,923 | $81,491 | $74,183 |
| WISTAR INSTITUTE | | | | | | | | | | | |
| Total Awards | $22,321,981 | $21,172,880 | $21,698,596 | $19,191,557 | $14,205,766 | $12,032,528 | $12,183,153 | $12,461,796 | $12,328,144 | $15,217,175 | $162,813,576 |
| No. of Awards | 77 | 73 | 74 | 59 | 46 | 43 | 40 | 37 | 42 | 50 | 541 |
| Average Awards | $289,896 | $290,039 | $293,224 | $325,281 | $308,821 | $279,826 | $304,579 | $336,805 | $293,527 | $304,344 | $300,949 |
| YORK HOSPITAL (YORK, PA) | | | | | | | | | | | |
| Total Awards | | | | | | | $30,000 | | | | $30,000 |
| No. of Awards | | | | | | | 1 | | | | 1 |
| Average Awards | | | | | | | $30,000 | | | | $30,000 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ZIVIC MILLER LABORATORIES, INC. | | | | | | | | | | | |
| Total Awards | | | | $50,000 | | | | | | | $50,000 |
| No. of Awards | | | | 1 | | | | | | | 1 |
| Average Awards | | | | $50,000 | | | | | | | $50,000 |
| ZYNAXIS, INC. | | | | | | | | | | | |
| Total Awards | $50,000 | $50,000 | $273,112 | $318,365 | | | $329,093 | $441,675 | | | $1,462,245 |
| No. of Awards | 1 | 1 | 2 | 2 | | | 1 | 2 | | | 9 |
| Average Awards | $50,000 | $50,000 | $136,556 | $159,183 | | | $329,093 | $220,838 | | | $162,472 |
| PA TOTAL | | | | | | | | | | | |
| Total Awards | $383,612,649 | $406,994,015 | $464,096,480 | $513,745,945 | $523,370,790 | $543,224,853 | $589,943,373 | $616,757,551 | $681,344,904 | $735,155,571 | $5,458,246,131 |
| No. of Awards | 1,927 | 1,976 | 2,166 | 2,187 | 2,165 | 2,278 | 2,367 | 2,422 | 2,578 | 2,706 | 22,772 |
| Average Awards | $199,072 | $205,969 | $214,264 | $234,909 | $241,742 | $238,466 | $249,237 | $254,648 | $264,292 | $271,676 | $239,691 |

SOURCE: Data provided by the Office of Reports and Analysis, Office of Extramural Research, National Institutes of Health, Bethesda, MD, August 1999.

APPENDIX A - 2
GROWTH OF TOTAL NIH AWARDS TO INDIVIDUAL PENNSYLVANIA INSTITUTIONS
Total Awards, No. of Awards and Average Awards
1989 to 1998

| Institution | 1989 to 1990 | 1990 to 1991 | 1991 to 1992 | 1992 to 1993 | 1993 to 1994 | 1994 to 1995 | 1995 to 1996 | 1996 to 1997 | 1997 to 1998 | 10-Year Growth |
|---|---|---|---|---|---|---|---|---|---|---|
| ACADEMY OF NATURAL SCIENCES | | | | | | | | | | |
| Total Awards | 13.5% | 2.8% | 12.2% | 15.6% | -3.7% | 3.3% | -100.0% | | -100.0% | |
| No. of Awards | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | -100.0% | | -100.0% | |
| Average Awards | 13.5% | 2.8% | 12.2% | 15.6% | -3.7% | 3.3% | | | | |
| ACTUARIAL FORECASTING AND RESEARCH | | | | | | | | | | |
| Total Awards | | | | | | 408.7% | -38.3% | -100.0% | | |
| No. of Awards | | | | | | 0.0% | 0.0% | -100.0% | | |
| Average Awards | | | | | | 408.7% | -38.3% | | | |
| ADOLOR CORPORATION | | | | | | | | | | |
| Total Awards | | | | | | | | | -100.0% | |
| No. of Awards | | | | | | | | | -100.0% | |
| Average Awards | | | | | | | | | | |
| ADVENT HEALTH TECHNOLOGY | | | | | | | | | | |
| Total Awards | | | | | | | -100.0% | | | |
| No. of Awards | | | | | | | -100.0% | | | |
| Average Awards | | | | | | | | | | |
| AIDS COMMUNITY ALLIANCE | | | | | | | | | | |
| Total Awards | | | | | | | | | | |
| No. of Awards | | | | | | | | | | |
| Average Awards | | | | | | | | | | |
| ALBERT EINSTEIN MED CTR (PHILADELPHIA) | | | | | | | | | | |
| Total Awards | -27.1% | -50.2% | 75.4% | 5.6% | 75.1% | 66.3% | -6.6% | -47.0% | -63.6% | -7.2% |
| No. of Awards | 33.3% | 0.0% | 0.0% | -50.0% | 50.0% | 0.0% | 0.0% | -33.3% | -50.0% | -7.4% |
| Average Awards | -45.3% | -50.2% | 75.4% | 111.1% | 16.7% | 66.3% | -6.6% | -20.4% | -27.3% | 0.6% |
| ALLEGHENY COLLEGE | | | | | | | | | | |
| Total Awards | | 61.3% | -100.0% | | -100.0% | | | | | |
| No. of Awards | | 0.0% | -100.0% | | -100.0% | | | | | |
| Average Awards | | 61.3% | | | | | | | | |
| ALLEGHENY COUNTY HUMAN SERVICES DEPT | | | | | | | | | | |
| Total Awards | -11.8% | -56.8% | -100.0% | | | | | | | |
| No. of Awards | 0.0% | -100.0% | | | | | | | | |
| Average Awards | -11.8% | | | | | | | | | |

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|---|---|---|---|---|---|---|---|---|---|---|
| ALLEGHENY GENERAL HOSP (PITTSBURGH) | | | | | | | | | | |
| Total Awards | | | | | 4.7% | -76.3% | 333.1% | 74.3% | -100.0% | |
| No. of Awards | | | | | 0.0% | -50.0% | 100.0% | 50.0% | -100.0% | |
| Average Awards | | | | | 4.7% | -52.6% | 116.6% | 16.2% | | |
| ALLEGHENY UNIVERSITY OF HEALTH SCIENCES | | | | | | | | | | |
| Total Awards | 31.6% | 33.4% | -8.4% | -1.8% | 2.2% | 44.1% | 5.2% | 39.0% | -1.7% | 26.0% |
| No. of Awards | 5.0% | 22.2% | -7.8% | -1.4% | 2.9% | 52.8% | 3.6% | 29.8% | -0.7% | 16.1% |
| Average Awards | 25.4% | 9.1% | -0.7% | -0.4% | -0.7% | -5.7% | 1.5% | 7.1% | -1.0% | 4.0% |
| ALLEGHENY-SINGER RESEARCH INSTITUTE | | | | | | | | | | |
| Total Awards | 12.5% | 44.3% | -13.8% | 28.5% | -15.9% | -10.4% | 831.9% | -0.6% | -72.9% | 26.7% |
| No. of Awards | 14.3% | 37.5% | 9.1% | 0.0% | 0.0% | -25.0% | 44.4% | -7.7% | -25.0% | 3.2% |
| Average Awards | -1.5% | 4.9% | -20.9% | 28.5% | -15.9% | 19.4% | 545.1% | 7.7% | -63.8% | 18.3% |
| AMERICAN AGING ASSOCIATION | | | | | | | | | | |
| Total Awards | | | | | | 61.1% | 10.9% | -100.0% | | |
| No. of Awards | | | | | | 0.0% | 0.0% | -100.0% | | |
| Average Awards | | | | | | 61.1% | 10.9% | | | |
| AMERICAN ASSOCIATION FOR CANCER RESEARCH | | | | | | | | | | |
| Total Awards | 44.5% | -38.4% | 1233.4% | 74.7% | -1.8% | 11.1% | 38.3% | 20.6% | -2.7% | 397.1% |
| No. of Awards | 0.0% | -33.3% | 200.0% | 0.0% | 0.0% | -50.0% | 33.3% | 25.0% | 0.0% | 7.4% |
| Average Awards | 44.5% | -7.6% | 344.5% | 74.7% | -1.8% | 122.2% | 3.7% | -3.5% | -2.7% | 233.8% |
| AMERICAN COLLEGE OF PHYSICIANS | | | | | | | | | | |
| Total Awards | | | | | | | | | -100.0% | |
| No. of Awards | | | | | | | | | -100.0% | |
| Average Awards | | | | | | | | | | |
| AMERICAN MOTILITY SOCIETY | | | | | | | | | | |
| Total Awards | | -100.0% | | | | | | | | |
| No. of Awards | | -100.0% | | | | | | | | |
| Average Awards | | | | | | | | | | |
| ANATEK, INC. | | | | | | | | | | |
| Total Awards | | | | | | | -53.9% | -100.0% | | |
| No. of Awards | | | | | | | -50.0% | -100.0% | | |
| Average Awards | | | | | | | -7.9% | | | |
| ANIMAS CORPORATION | | | | | | | | | | |
| Total Awards | | | | | | | | | | |
| No. of Awards | | | | | | | | | | |
| Average Awards | | | | | | | | | | |
| APOLLON, INC. | | | | | | | | | | |
| Total Awards | | | | | | -100.0% | | | | |
| No. of Awards | | | | | | -100.0% | | | | |
| Average Awards | | | | | | | | | | |

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|---|---|---|---|---|---|---|---|---|
| ARGUS RESEARCH LABORATORIES, INC. | | | | | | | | |
| Total Awards | -100.0% | | | | | | | |
| No. of Awards | -100.0% | | | | | | | |
| Average Awards | | | | | | | | |
| ARRAY VISION ENGINEERING COMPANY | | | | | | | | |
| Total Awards | | | | | | -100.0% | | |
| No. of Awards | | | | | | -100.0% | | |
| Average Awards | | | | | | | | |
| ARTSCO, INC. | | | | | | | | |
| Total Awards | | | | | | | 255.2% | -67.0% |
| No. of Awards | | | | | | | 200.0% | -66.7% |
| Average Awards | | | | | | | 18.4% | -0.9% |
| AT BIOCHEM | | | | | | | | |
| Total Awards | | | -100.0% | | | | | |
| No. of Awards | | | -100.0% | | | | | |
| Average Awards | | | | | | | | |
| AUGMENTECH, INC. | | | | | | | | |
| Total Awards | -100.0% | | | | 17.9% | -100.0% | | 268.3% |
| No. of Awards | -100.0% | | | | 0.0% | -100.0% | | 0.0% |
| Average Awards | | | | | 17.9% | | | 268.3% |
| AUTOMATED CELL TECHNOLOGIES, INC. | | | | | | | | |
| Total Awards | | | | | | | | -100.0% |
| No. of Awards | | | | | | | | -100.0% |
| Average Awards | | | | | | | | |
| AVECON DIAGNOSTICS, INC. | | | | | | | | |
| Total Awards | | | | | | | | -100.0% |
| No. of Awards | | | | | | | | -100.0% |
| Average Awards | | | | | | | | |
| AVID THERAPEUTICS, INC. | | | | | | | | |
| Total Awards | | | | -100.0% | | | | |
| No. of Awards | | | | -100.0% | | | | |
| Average Awards | | | | | | | | |
| AVITECH DIAGNOSTICS | | | | | | | | |
| Total Awards | | | | | 347.1% | -12.3% | -100.0% | |
| No. of Awards | | | | | 0.0% | 0.0% | -100.0% | |
| Average Awards | | | | | 347.1% | -12.3% | | |
| BEARSDEN BIO, INC. | | | | | | | | |
| Total Awards | | | | | | | 112.3% | 19.1% |
| No. of Awards | | | | | | | 100.0% | -50.0% |
| Average Awards | | | | | | | 6.2% | 138.3% |

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|---|---|---|---|---|---|---|---|---|---|---|
| BEAVER COLLEGE | | | | | | | | | | |
| Total Awards | | | | | | 35.7% | -11.0% | -54.2% | -100.0% | |
| No. of Awards | | | | | | 0.0% | 0.0% | 0.0% | -100.0% | |
| Average Awards | | | | | | 35.7% | -11.0% | -54.2% | | |
| BELMONT CENTER/COMPREHENSIVE TREATMENT | | | | | | | | | | |
| Total Awards | 7.9% | -41.1% | -100.0% | | 46.0% | -26.4% | -100.0% | | | |
| No. of Awards | 200.0% | -66.7% | -100.0% | | 0.0% | 0.0% | -100.0% | | | |
| Average Awards | -64.0% | 76.6% | | | 46.0% | -26.4% | | | | |
| BIO MED SCIENCES, INC. | | | | | | | | | | |
| Total Awards | | -50.0% | 0.0% | -100.0% | | | | | | |
| No. of Awards | | -50.0% | 0.0% | -100.0% | | | | | | |
| Average Awards | | 0.0% | 0.0% | | | | | | | |
| BIOFOR, INC. | | | | | | | | | | |
| Total Awards | | | | | -100.0% | | | | | |
| No. of Awards | | | | | -100.0% | | | | | |
| Average Awards | | | | | | | | | | |
| BIOLOGICAL ABSTRACTS | | | | | | | | | | |
| Total Awards | 6.2% | 4.1% | 18.5% | 5.5% | 85.8% | -38.9% | 12.7% | 0.0% | 15.2% | 11.5% |
| No. of Awards | 0.0% | 100.0% | -50.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Average Awards | 6.2% | -47.9% | 136.9% | 5.5% | 85.8% | -38.9% | 12.7% | 0.0% | 15.2% | 11.5% |
| BIOMATION, LTD. | | | | | | | | | | |
| Total Awards | | | | | | | | -100.0% | | |
| No. of Awards | | | | | | | | -100.0% | | |
| Av erage Awards | | | | | | | | | | |
| BIOMED RESEARCH AND TECHNOLOGIES, INC. | | | | | | | | | | |
| Total Awards | | | | | | | | -100.0% | | |
| No. of Awards | | | | | | | | -100.0% | | |
| Average Awards | | | | | | | | | | |
| BIOMOL RESEARCH LABORATORIES, INC. | | | | | | | | | | |
| Total Awards | | -100.0% | | 99.7% | -100.0% | | | | | |
| No. of Awards | | -100.0% | | 100.0% | -100.0% | | | | | |
| Average Awards | | | | -0.2% | | | | | | |
| BIOPORE, INC. | | | | | | | | | | |
| Total Awards | | | | | | | | | 8.6% | |
| No. of Awards | | | | | | | | | 0.0% | |
| Average Awards | | | | | | | | | 8.6% | |
| BIOSYN, INC. | | | | | | | | | | |
| Total Awards | | | | | | -100.0% | | | | |
| No. of Awards | | | | | | -100.0% | | | | |
| Average Awards | | | | | | | | | | |

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|---|---|---|---|---|---|---|---|---|---|---|
| BIPHASICS, INC. | | | | | | | | | | |
| Total Awards | | | -8.2% | -100.0% | | | | | | |
| No. of Awards | | | 0.0% | -100.0% | | | | | | |
| Average Awards | | | -8.2% | | | | | | | |
| BLOOMSBURG UNIVERSITY OF PENNSYLVANIA | | | | | | | | | | |
| Total Awards | -100.0% | | | | | | | | | |
| No. of Awards | -100.0% | | | | | | | | | |
| Average Awards | | | | | | | | | | |
| BLUE LIGHTNING DATA AND SOFTWARE, INC. | | | | | | | | | | |
| Total Awards | | | | | -100.0% | | | | | |
| No. of Awards | | | | | -100.0% | | | | | |
| Average Awards | | | | | | | | | | |
| BROUDY PRINTING, INC. | | | | | | | | | | |
| Total Awards | | | -100.0% | | | | | | | |
| No. of Awards | | | -100.0% | | | | | | | |
| Average Awards | | | | | | | | | | |
| BRYN MAWR COLLEGE | | | | | | | | | | |
| Total Awards | 5.4% | 62.6% | 0.5% | -60.3% | 104.2% | -21.2% | 0.3% | -52.6% | 26.5% | -3.8% |
| No. of Awards | -25.0% | 100.0% | 0.0% | -50.0% | 33.3% | -50.0% | -50.0% | 100.0% | 50.0% | -2.8% |
| Average Awards | 40.6% | -18.7% | 0.5% | -20.7% | 53.1% | 57.6% | 100.7% | -76.3% | -15.6% | -1.3% |
| BUCKNELL UNIVERSITY | | | | | | | | | | |
| Total Awards | 86.5% | 3.7% | -47.0% | -0.2% | 8.7% | -100.0% | | | -100.0% | |
| No. of Awards | 100.0% | 0.0% | -50.0% | 0.0% | 0.0% | -100.0% | | | -100.0% | |
| Average Awards | -6.7% | 3.7% | 6.0% | -0.2% | 8.7% | | | | | |
| C AND L INSTRUMENTS, INC. | | | | | | | | | | |
| Total Awards | | | | | | | -100.0% | | -2.0% | |
| No. of Awards | | | | | | | -100.0% | | 0.0% | |
| Average Awards | | | | | | | | | -2.0% | |
| CARDIOPULMARY TECHNOLOGIES, INC. | | | | | | | | | | |
| Total Awards | | | | | | | | | | |
| No. of Awards | | | | | | | | | | |
| Average Awards | | | | | | | | | | |
| CARLOW COLLEGE | | | | | | | | | | |
| Total Awards | | | | | | -37.0% | -100.0% | | 31.1% | |
| No. of Awards | | | | | | 0.0% | -100.0% | | 0.0% | |
| Average Awards | | | | | | -37.0% | | | 31.1% | |
| CARNEGIE MELLON UNIVERSITY | | | | | | | | | | |
| Total Awards | -12.4% | 24.5% | -2.8% | 22.7% | -1.3% | 0.4% | -0.4% | 11.7% | 1.6% | 5.1% |
| No. of Awards | -16.7% | 15.6% | -13.5% | 13.3% | -5.9% | 16.7% | -1.8% | 7.3% | -13.6% | -0.6% |
| Average Awards | 5.1% | 7.7% | 12.3% | 8.3% | 4.9% | -14.0% | 1.4% | 4.1% | 17.5% | 6.0% |

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| CELLOMICS, INC. | | | | | | | | | | |
| Total Awards | | | | | | | | | | |
| No. of Awards | | | | | | | | | | |
| Average Awards | | | | | | | | | | |
| CENTOCOR, INC. | | | | | | | | | | |
| Total Awards | | | | | 0.0% | 2359.6% | -22.4% | -100.0% | | |
| No. of Awards | | | | | 0.0% | 0.0% | 0.0% | -100.0% | | |
| Average Awards | | | | | 0.0% | 2359.6% | -22.4% | | | |
| CEPHALON, INC. | | | | | | | | | | |
| Total Awards | 0.0% | -100.0% | | -100.0% | | | | | | |
| No. of Awards | 0.0% | -100.0% | | -100.0% | | | | | | |
| Average Awards | 0.0% | | | | | | | | | |
| CHARCOT-MARIE-TOOTH ASSOCIATION | | | | | | | | | | |
| Total Awards | | | | | | | | | | |
| No. of Awards | | | | | | | | | | |
| Average Awards | | | | | | | | | | |
| CHEM-SPACE ASSOCIATES | | | | | | | | | | |
| Total Awards | | | | | | | | -100.0% | | |
| No. of Awards | | | | | | | | -100.0% | | |
| Average Awards | | | | | | | | | | |
| CHERRYSTONE CORPORATION | | | | | | | | | | |
| Total Awards | | | | | -100.0% | | | | | |
| No. of Awards | | | | | -100.0% | | | | | |
| Average Awards | | | | | | | | | | |
| CHESTER COUNTY AIDS SUPPORT SERVICES | | | | | | | | | | |
| Total Awards | | | | | | | | | -100.0% | |
| No. of Awards | | | | | | | | | -100.0% | |
| Average Awards | | | | | | | | | | |
| CHI SYSTEMS, INC. | | | | | | | | | | |
| Total Awards | | | | | | 989.8% | 39.0% | -0.7% | -24.5% | |
| No. of Awards | | | | | | 200.0% | -33.3% | 0.0% | 50.0% | |
| Average Awards | | | | | | 263.3% | 108.5% | -0.7% | -49.7% | |
| CHILDREN'S HOSPITAL OF PHILADELPHIA | | | | | | | | | | |
| Total Awards | 1.4% | 8.8% | 17.3% | 22.8% | 19.4% | 9.8% | 2.6% | 8.8% | 17.0% | 19.1% |
| No. of Awards | 7.7% | 0.0% | 14.3% | 0.0% | 1.6% | 13.8% | 6.8% | 10.1% | 25.3% | 12.2% |
| Average Awards | -5.9% | 8.8% | 2.7% | 22.8% | 17.6% | -3.6% | -3.9% | -1.2% | -6.6% | 3.3% |
| CHILDREN'S HOSPITAL OF PITTSBURGH | | | | | | | | | | |
| Total Awards | 8.4% | -7.0% | 97.4% | 1.4% | 8.2% | -9.1% | 5.5% | -2.7% | -30.3% | 4.7% |
| No. of Awards | -6.7% | 42.9% | 35.0% | -3.7% | -7.7% | 0.0% | -4.2% | 13.0% | -23.1% | 3.7% |
| Average Awards | 16.2% | -34.9% | 46.2% | 5.3% | 17.2% | -9.1% | 10.1% | -13.9% | -9.4% | 0.7% |

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| CHILDREN'S SEASHORE HOUSE | | | | | | | |
| Total Awards | | | | | 12.4% | 22.0% | 2.7% |
| No. of Awards | | | | | 50.0% | -33.3% | 0.0% |
| Average Awards | | | | | -25.1% | 83.0% | 2.7% |
| CITIZENS GENERAL HOSPITAL | | | | | | | |
| Total Awards | -100.0% | | | | | | |
| No. of Awards | -100.0% | | | | | | |
| Average Awards | | | | | | | |
| CLINICAL TOOLS, INC. | | | | | | | |
| Total Awards | | | | | -12.2% | -43.2% | 0.2% |
| No. of Awards | | | | | 0.0% | 100.0% | 0.0% |
| Average Awards | | | | | -12.2% | -71.6% | 0.2% |
| COACT TECHNOLOGIES | | | | | | | |
| Total Awards | -100.0% | | -7.8% | -100.0% | | | |
| No. of Awards | -100.0% | | 0.0% | -100.0% | | | |
| Average Awards | | | -7.8% | | | | |
| COGENICS, INC. | | | | | | | |
| Total Awards | | | | -100.0% | | | |
| No. of Awards | | | | -100.0% | | | |
| Average Awards | | | | | | | |
| COMMUNITY COLLEGE OF ALLEGHENY CNTY ALLE | | | | | | | |
| Total Awards | | | | | | -100.0% | |
| No. of Awards | | | | | | -100.0% | |
| Average Awards | | | | | | | |
| COMMUNITY SERVICES INSTITUTE, INC. | | | | | | | |
| Total Awards | -100.0% | | | | | | |
| No. of Awards | -100.0% | | | | | | |
| Average Awards | | | | | | | |
| COMPASS INFORMATION SERVICES, INC. | | | | | | | |
| Total Awards | | | | | 234.4% | -100.0% | |
| No. of Awards | | | | | 0.0% | -100.0% | |
| Average Awards | | | | | 234.4% | | |
| COMPUTATIONAL DIAGNOSTICS, INC. | | | | | | | |
| Total Awards | | | | | | | -100.0% |
| No. of Awards | | | | | | | -100.0% |
| Average Awards | | | | | | | |
| COMPUTER HUMAN INTERFACE, INC. | | | | | | | |
| Total Awards | | -11.6% | -100.0% | | | | |
| No. of Awards | | 0.0% | -100.0% | | | | |
| Average Awards | | -11.6% | | | | | |

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|---|---|---|---|---|---|---|---|---|---|
| CONREX PHARMACEUTICAL CORPORATION | | | | | | | | | |
| Total Awards | -100.0% | | | | | | | | |
| No. of Awards | -100.0% | | | | | | | | |
| Average Awards | | | | | | | | | |
| CONSAD RESEARCH CORPORATION | | | | | | | | | |
| Total Awards | 73.4% | 137.3% | -41.5% | -100.0% | | | | | |
| No. of Awards | 0.0% | 100.0% | 0.0% | -100.0% | | | | | |
| Average Awards | 73.4% | 18.7% | -41.5% | | | | | | |
| CONSERVATION CENTER/ARTS & HIST ARTIFCTS | | | | | | | | | |
| Total Awards | | | 5.1% | -4.4% | -100.0% | | | | |
| No. of Awards | | | 0.0% | 0.0% | -100.0% | | | | |
| Average Awards | | | 5.1% | -4.4% | | | | | |
| COSTELLO PHARMACEUTICAL | | | | | | | | | |
| Total Awards | | | | | | | | | -100.0% |
| No. of Awards | | | | | | | | | -100.0% |
| Average Awards | | | | | | | | | |
| CROZER-KEYSTONE HEALTH SYSTEM | | | | | | | | | |
| Total Awards | | | | | | | | -100.0% | |
| No. of Awards | | | | | | | | -100.0% | |
| Average Awards | | | | | | | | | |
| CYBERGENETICS COMPANY | | | | | | | | | |
| Total Awards | | | | | | | | | 338.0% |
| No. of Awards | | | | | | | | | 0.0% |
| Average Awards | | | | | | | | | 338.0% |
| DANIEL H. WAGNER ASSOCIATES | | | | | | | | | |
| Total Awards | | | | | 61.4% | 270.4% | -100.0% | | 56.8% |
| No. of Awards | | | | | 0.0% | 200.0% | -100.0% | | 200.0% |
| Average Awards | | | | | 61.4% | 23.5% | | | -47.7% |
| DATING VIOLENCE PREVENTION PROJECT, INC. | | | | | | | | | |
| Total Awards | | | | | | | | | -79.7% |
| No. of Awards | | | | | | | | | -100.0% |
| Average Awards | | | | | | | | | |
| DELAWARE WATER GAP SCIENCE INSTITUTE | | | | | | | | | |
| Total Awards | | | | | | | | | -2.1% |
| No. of Awards | | | | | | | | | 0.0% |
| Average Awards | | | | | | | | | -2.1% |
| DELTAMETRICS | | | | | | | | | |
| Total Awards | | | | | | | | | |
| No. of Awards | | | | | | | | | |
| Average Awards | | | | | | | | | |

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| DEMEGEN, INC. | | | | | | | | | | |
| Total Awards | | | | | | | | | -1.5% | |
| No. of Awards | | | | | | | | | 0.0% | |
| Average Awards | | | | | | | | | -1.5% | |
| DENTALASERS | | | | | | | | | | |
| Total Awards | | -100.0% | | | | | | | | |
| No. of Awards | | -100.0% | | | | | | | | |
| Average Awards | | | | | | | | | | |
| DIAGNOSTIC AND REHABILITATION CENTER | | | | | | | | | | |
| Total Awards | -100.0% | | | | | | | | | |
| No. of Awards | -100.0% | | | | | | | | | |
| Average Awards | | | | | | | | | | |
| DICKINSON COLLEGE | | | | | | | | | | |
| Total Awards | | | -3.3% | -100.0% | | | | | -100.0% | |
| No. of Awards | | | 0.0% | -100.0% | | | | | -100.0% | |
| Average Awards | | | -3.3% | | | | | | | |
| DIGESTIVE CARE, INC. | | | | | | | | | | |
| Total Awards | | | | | | -8.8% | -100.0% | | | |
| No. of Awards | | | | | | 100.0% | -100.0% | | | |
| Average Awards | | | | | | -54.4% | | | | |
| DREXEL UNIVERSITY | | | | | | | | | | |
| Total Awards | 31.0% | 8.0% | 16.7% | -64.2% | 139.8% | -13.8% | -11.1% | -20.6% | 108.0% | 8.8% |
| No. of Awards | 20.0% | 8.3% | -7.7% | -41.7% | 14.3% | 0.0% | -37.5% | 20.0% | 33.3% | -2.2% |
| Average Awards | 9.2% | -0.3% | 26.4% | -38.7% | 109.8% | -13.8% | 42.3% | -33.9% | 56.0% | 13.8% |
| DUBOIS REGIONAL MEDICAL CENTER | | | | | | | | | | |
| Total Awards | | | -100.0% | | | | | | | |
| No. of Awards | | | -100.0% | | | | | | | |
| Average Awards | | | | | | | | | | |
| DUQUESNE LITHO, INC. | | | | | | | | | | |
| Total Awards | | -60.6% | -100.0% | | | | | | | |
| No. of Awards | | 0.0% | -100.0% | | | | | | | |
| Average Awards | | -60.6% | | | | | | | | |
| DUQUESNE UNIVERSITY | | | | | | | | | | |
| Total Awards | 2.2% | 578.6% | -51.6% | 23.6% | -21.0% | -50.3% | 52.0% | 91.4% | 160.0% | 125.7% |
| No. of Awards | 0.0% | 500.0% | -50.0% | 33.3% | -25.0% | -66.7% | 0.0% | 200.0% | 166.7% | 77.8% |
| Average Awards | 2.2% | 13.1% | -3.2% | -7.3% | 5.3% | 49.0% | 52.0% | -36.2% | -2.5% | 6.0% |
| DYMAX CORPORATION | | | | | | | | | | |
| Total Awards | | | | -100.0% | | | | | | |
| No. of Awards | | | | -100.0% | | | | | | |
| Average Awards | | | | | | | | | | |

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| DYNAMIC DIGITAL DISPLAYS, INC. | | | | | | | | |
| Total Awards | -100.0% | | -100.0% | | | | | |
| No. of Awards | -100.0% | | -100.0% | | | | | |
| Average Awards | | | | | | | | |
| EDINBORO UNIVERSITY OF PENNSYLVANIA | | | | | | | | |
| Total Awards | -3.3% | 0.9% | -100.0% | | | | | |
| No. of Awards | 0.0% | 0.0% | -100.0% | | | | | |
| Average Awards | -3.3% | 0.9% | | | | | | |
| ELIZABETHTOWN COLLEGE | | | | | | | | |
| Total Awards | | | | | | | -100.0% | |
| No. of Awards | | | | | | | -100.0% | |
| Average Awards | | | | | | | | |
| EMERGENCY CARE RESEARCH INSTITUTE | | | | | | | | |
| Total Awards | | | 82.7% | -23.0% | -100.0% | 36.2% | 1.0% | -100.0% |
| No. of Awards | | | 0.0% | 0.0% | -100.0% | 0.0% | 0.0% | -100.0% |
| Average Awards | | | 82.7% | -23.0% | | 36.2% | 1.0% | |
| ENZYMATICS, INC. | | | | | | | | |
| Total Awards | 907.9% | -100.0% | | | -100.0% | | | |
| No. of Awards | 0.0% | -100.0% | | | -100.0% | | | |
| Average Awards | 907.9% | | | | | | | |
| EPHRATA COMMUNITY HOSPITAL | | | | | | | | |
| Total Awards | | | | | | | | -100.0% |
| No. of Awards | | | | | | | | -100.0% |
| Average Awards | | | | | | | | |
| EXOCELL, INC. | | | | | | | | |
| Total Awards | | 140.3% | 107.2% | -53.2% | -100.0% | -100.0% | | 98.2% |
| No. of Awards | | 0.0% | 0.0% | -50.0% | -100.0% | -100.0% | | 100.0% |
| Average Awards | | 140.3% | 107.2% | -6.5% | | | | -0.9% |
| EXTREL CORPORATION | | | | | | | | |
| Total Awards | -100.0% | | -100.0% | | | | | |
| No. of Awards | -100.0% | | -100.0% | | | | | |
| Average Awards | | | | | | | | |
| EXZYME, INC. | | | | | | | | |
| Total Awards | | | | | | | 1.1% | -100.0% |
| No. of Awards | | | | | | | 0.0% | -100.0% |
| Average Awards | | | | | | | 1.1% | |
| EYE AND EAR HOSPITAL OF PITTSBURGH | | | | | | | | |
| Total Awards | -92.7% | -100.0% | | | | | | |
| No. of Awards | -72.7% | -100.0% | | | | | | |
| Average Awards | -73.2% | | | | | | | |

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| EYE AND EAR INSTITUTE OF PITTSBURGH | | | | | | | | | | |
| Total Awards | 305.6% | 61.0% | 13.1% | 2.2% | -100.0% | | | | | |
| No. of Awards | 240.0% | 35.3% | 13.0% | -3.8% | -100.0% | | | | | |
| Average Awards | 19.3% | 19.0% | 0.1% | 6.3% | | | | | | |
| FAMILY HEALTH COUNCIL OF CENT PA | | | | | | | | | | |
| Total Awards | -100.0% | | | | | | | | | |
| No. of Awards | -100.0% | | | | | | | | | |
| Average Awards | | | | | | | | | | |
| FERTILITY TESTING LABORATORY | | | | | | | | | | |
| Total Awards | -100.0% | | | | | | | | | |
| No. of Awards | -100.0% | | | | | | | | | |
| Average Awards | | | | | | | | | | |
| FIELD DIAGNOSTIC SERVICES, INC. | | | | | | | | | | |
| Total Awards | | | | | | | | | 39.5% | |
| No. of Awards | | | | | | | | | 100.0% | |
| Average Awards | | | | | | | | | -30.3% | |
| FORSYTH ELECTRO-OPTICS | | | | | | | | | | |
| Total Awards | | | | | | -100.0% | | | | |
| No. of Awards | | | | | | -100.0% | | | | |
| Average Awards | | | | | | | | | | |
| FOX CHASE CANCER CENTER | | | | | | | | | | |
| Total Awards | 84.3% | 6.8% | 4.5% | 4.1% | 21.1% | 3.5% | 0.4% | 3.1% | -1.7% | 19.3% |
| No. of Awards | 8.8% | 16.2% | 20.9% | 11.5% | 6.9% | 12.9% | -11.4% | -1.6% | -9.8% | 6.9% |
| Average Awards | 69.3% | -8.1% | -13.6% | -6.6% | 13.3% | -8.4% | 13.4% | 4.8% | 9.1% | 7.7% |
| FOX FARSIGHT PRODUCTIONS, INC. | | | | | | | | | | |
| Total Awards | | | | | | | | | | |
| No. of Awards | | | | | | | | | | |
| Average Awards | | | | | | | | | | |
| FRANKLIN AND MARSHALL COLLEGE | | | | | | | | | | |
| Total Awards | -100.0% | | | | | | 4.8% | -100.0% | | |
| No. of Awards | -100.0% | | | | | | 0.0% | -100.0% | | |
| Average Awards | | | | | | | 4.8% | | | |
| GEISINGER FOUNDATION | | | | | | | | | | |
| Total Awards | 17.3% | 1286.0% | -2.7% | -100.0% | | -70.1% | 318.5% | 72.5% | -100.0% | |
| No. of Awards | 0.0% | 100.0% | 0.0% | -100.0% | | 0.0% | 0.0% | 0.0% | -100.0% | |
| Average Awards | 17.3% | 593.0% | -2.7% | | | -70.1% | 318.5% | 72.5% | | |
| GEISINGER MEDICAL CENTER | | | | | | | | | | |
| Total Awards | -23.1% | -14.1% | 24.2% | -100.0% | | | | | | |
| No. of Awards | 0.0% | -33.3% | 0.0% | -100.0% | | | | | | |
| Average Awards | -23.1% | 28.8% | 24.2% | | | | | | | |

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| GENE TRANSCRIPTION TECH, INC. | | | | | | | | | | |
| Total Awards | | | | | | | | | | |
| No. of Awards | | | | | | | | | | |
| Average Awards | | | | | | | | | | |
| GENERAL GRAPHIC SERVICES | | | | | | | | | | |
| Total Awards | | | | | | | | -100.0% | | |
| No. of Awards | | | | | | | | -100.0% | | |
| Average Awards | | | | | | | | | | |
| GETTYSBURG COLLEGE | | | | | | | | | | |
| Total Awards | | -100.0% | | -100.0% | | | | | | |
| No. of Awards | | -100.0% | | -100.0% | | | | | | |
| Average Awards | | | | | | | | | | |
| GRADUATE HOSPITAL (PHILADELPHIA) | | | | | | | | | | |
| Total Awards | 14.1% | 4.4% | 45.0% | -10.9% | -5.7% | 12.7% | -40.5% | -12.6% | -68.5% | -8.1% |
| No. of Awards | 20.0% | 0.0% | 16.7% | -14.3% | -16.7% | 10.0% | -36.4% | -28.6% | -80.0% | -10.0% |
| Average Awards | -5.0% | 4.4% | 24.3% | 3.9% | 13.2% | 2.4% | -6.4% | 22.4% | 57.7% | 18.7% |
| GUTHRIE FOUNDATION FOR EDUCATION AND RES | | | | | | | | | | |
| Total Awards | 0.4% | -38.6% | -100.0% | | -32.1% | 37.6% | 1.4% | 164.5% | -17.9% | |
| No. of Awards | 0.0% | 0.0% | -100.0% | | 0.0% | 0.0% | 0.0% | 50.0% | -33.3% | |
| Average Awards | 0.4% | -38.6% | | | -32.1% | 37.6% | 1.4% | 76.3% | 23.2% | |
| HAHNEMANN UNIVERSITY | | | | | | | | | | |
| Total Awards | -25.5% | 49.2% | -0.7% | -3.2% | -11.4% | -100.0% | | | | |
| No. of Awards | -13.0% | 10.0% | -9.1% | 7.5% | -7.0% | -100.0% | | | | |
| Average Awards | -14.3% | 35.7% | 9.2% | -10.0% | -4.8% | | | | | |
| HAVERFORD COLLEGE | | | | | | | | | | |
| Total Awards | | -100.0% | | | | -100.0% | | | | |
| No. of Awards | | -100.0% | | | | -100.0% | | | | |
| Average Awards | | | | | | | | | | |
| HAZLETON RESEARCH PRODUCTS, INC. | | | | | | | | | | |
| Total Awards | -16.0% | -85.0% | 698.0% | 69.2% | 9.8% | -4.0% | -4.9% | -1.3% | -100.0% | |
| No. of Awards | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | -100.0% | | |
| Average Awards | -16.0% | -85.0% | 698.0% | 69.2% | 9.8% | -4.0% | -4.9% | | | |
| HD TECHNOLOGIES, INC. | | | | | | | | | | |
| Total Awards | | | | | | | -100.0% | | | |
| No. of Awards | | | | | | | -100.0% | | | |
| Average Awards | | | | | | | | | | |
| HEALTH FEDERATION OF PHILADELPHIA | | | | | | | | | | |
| Total Awards | | | | | | | -100.0% | | | |
| No. of Awards | | | | | | | -100.0% | | | |
| Average Awards | | | | | | | | | | |

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|---|---|---|---|---|---|---|---|---|---|---|
| HERCON LABORATORIES CORPORATION | | | | | | | | | | |
| Total Awards | -100.0% | | | | | | | | | |
| No. of Awards | -100.0% | | | | | | | | | |
| Average Awards | | | | | | | | | | |
| HORIZON HOUSE | | | | | | | | | | |
| Total Awards | -92.2% | -100.0% | | | | | | | | |
| No. of Awards | -100.0% | | | | | | | | | |
| Average Awards | | | | | | | | | | |
| IMMACULATA COLLEGE | | | | | | | | | | |
| Total Awards | | | | | | | | | | |
| No. of Awards | | | | | | | | | | |
| Average Awards | | | | | | | | | | |
| IMMUNA CARE CORPORATION | | | | | | | | | | |
| Total Awards | | | -100.0% | | -100.0% | | | | | |
| No. of Awards | | | -100.0% | | -100.0% | | | | | |
| Average Awards | | | | | | | | | | |
| IMMUNICON CORPORATION | | | | | | | | | | |
| Total Awards | | | 101.5% | -16.2% | -100.0% | | | | | |
| No. of Awards | | | -50.0% | 0.0% | -100.0% | | | | | |
| Average Awards | | | 303.1% | -16.2% | | | | | | |
| INDIANA UNIVERSITY OF PENNSYLVANIA | | | | | | | | | | |
| Total Awards | | -100.0% | | -100.0% | | | | | | |
| No. of Awards | | -100.0% | | -100.0% | | | | | | |
| Average Awards | | | | | | | | | | |
| INDIVIDUAL AWARD--SPEAKER, SUSAN | | | | | | | | | | |
| Total Awards | | | | | | | | | | |
| No. of Awards | | | | | | | | | | |
| Average Awards | | | | | | | | | | |
| INDUSTRIAL BIOCATALYSIS, INC. | | | | | | | | | | |
| Total Awards | | | | | | | | -100.0% | | |
| No. of Awards | | | | | | | | -100.0% | | |
| Average Awards | | | | | | | | | | |
| INFORMATION SYSTEMS TECHNOLOGY CORP | | | | | | | | | | |
| Total Awards | 33.9% | -100.0% | | | | | | | | |
| No. of Awards | 0.0% | -100.0% | | | | | | | | |
| Average Awards | 33.9% | | | | | | | | | |
| INFORMATION VENTURES, INC. | | | | | | | | | | |
| Total Awards | 7.3% | 4.5% | -44.3% | 16.6% | -10.8% | 9.0% | -2.3% | 8.0% | -14.9% | -4.0% |
| No. of Awards | -40.0% | 33.3% | 0.0% | 25.0% | -40.0% | 0.0% | 33.3% | -25.0% | -33.3% | -6.7% |
| Average Awards | 78.8% | -21.6% | -44.3% | -6.7% | 48.7% | 9.0% | -26.8% | 44.0% | 27.7% | 6.6% |

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|---|---|---|---|---|---|---|---|---|---|---|
| INSTITUTE FOR CANCER RESEARCH | | | | | | | | | | |
| Total Awards | -43.7% | 7.4% | 11.8% | -5.8% | -18.1% | -2.8% | -2.5% | 24.7% | -5.3% | -4.6% |
| No. of Awards | -2.8% | -2.9% | 2.9% | -8.6% | 0.0% | -12.5% | -3.6% | 51.9% | -19.5% | -0.9% |
| Average Awards | -42.1% | 10.6% | 8.6% | 3.0% | -18.1% | 11.1% | 1.1% | -17.9% | 17.7% | -4.0% |
| INSTITUTE FOR COGNITIVE PROSTHETICS | | | | | | | | | | |
| Total Awards | | | | 433.7% | -5.3% | -100.0% | | | | |
| No. of Awards | | | | 0.0% | 0.0% | -100.0% | | | | |
| Average Awards | | | | 433.7% | -5.3% | | | | | |
| INSTITUTE FOR SCIENTIFIC INFORMATION | | | | | | | | | | |
| Total Awards | | | | | | | -100.0% | | | |
| No. of Awards | | | | | | | -100.0% | | | |
| Average Awards | | | | | | | | | | |
| INTEGRA, INC. | | | | | | | | | | |
| Total Awards | -11.1% | 94.3% | -32.6% | 168.2% | -58.3% | 69.6% | -100.0% | | | |
| No. of Awards | 0.0% | 200.0% | -66.7% | 200.0% | -66.7% | 0.0% | -100.0% | | | |
| Average Awards | -11.1% | -35.2% | 102.2% | -10.6% | 25.1% | 69.6% | | | | |
| INTERSCIENCES DEVELOPMENT ASSOCIATES | | | | | | | | | | |
| Total Awards | | | 10.7% | -100.0% | | | | | | |
| No. of Awards | | | 0.0% | -100.0% | | | | | | |
| Average Awards | | | 10.7% | | | | | | | |
| INTERSPEC, INC. | | | | | | | | | | |
| Total Awards | -100.0% | | | | | | | | | |
| No. of Awards | -100.0% | | | | | | | | | |
| Average Awards | | | | | | | | | | |
| J. C. BLAIR MEMORIAL HOSPITAL | | | | | | | | | | |
| Total Awards | | | -100.0% | | | | | | | |
| No. of Awards | | | -100.0% | | | | | | | |
| Average Awards | | | | | | | | | | |
| JMS VISION LOSS REHABILITATION | | | | | | | | | | |
| Total Awards | -1.8% | -100.0% | | | | | | | | |
| No. of Awards | 0.0% | -100.0% | | | | | | | | |
| Average Awards | -1.8% | | | | | | | | | |
| JOSEPH V. LAMBERT ASSOCIATES | | | | | | | | | | |
| Total Awards | -100.0% | | | | | | | | | |
| No. of Awards | -100.0% | | | | | | | | | |
| Average Awards | | | | | | | | | | |
| JUNIATA COLLEGE | | | | | | | | | | |
| Total Awards | | | | | | | | -26.1% | 5.0% | |
| No. of Awards | | | | | | | | 0.0% | 0.0% | |
| Average Awards | | | | | | | | -26.1% | 5.0% | |

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|---|---|---|---|---|---|---|---|---|---|---|
| KDL MEDICAL TECHNOLOGIES, INC. | | | | | | | | | | |
| Total Awards | | | | | -100.0% | | | 0.9% | -93.6% | |
| No. of Awards | | | | | -100.0% | | | 0.0% | 0.0% | |
| Average Awards | | | | | | | | 0.9% | -93.6% | |
| KESSLER COMMUNICATIONS, INC. | | | | | | | | | | |
| Total Awards | -17.3% | 27.1% | -8.5% | 10.6% | -100.0% | | | | | |
| No. of Awards | 0.0% | 100.0% | -50.0% | 0.0% | -100.0% | | | | | |
| Average Awards | -17.3% | -36.5% | 83.1% | 10.6% | | | | | | |
| KEYSTONE SCIENTIFIC, INC. | | | | | | | | | | |
| Total Awards | | | | | | | | -100.0% | | |
| No. of Awards | | | | | | | | -100.0% | | |
| Average Awards | | | | | | | | | | |
| LAKE ERIE COLLEGE/OSTEOPATHIC MEDICINE | | | | | | | | | | |
| Total Awards | | | | | | | -100.0% | | | |
| No. of Awards | | | | | | | -100.0% | | | |
| Average Awards | | | | | | | | | | |
| LANCASTER CLEFT PALATE CLINIC | | | | | | | | | | |
| Total Awards | | | | | | 96.9% | -97.1% | -100.0% | | |
| No. of Awards | | | | | | 0.0% | 0.0% | -100.0% | | |
| Average Awards | | | | | | 96.9% | -97.1% | | | |
| LANKENAU HOSPITAL | | | | | | | | | | |
| Total Awards | 7.0% | 6.4% | -100.0% | | | -27.1% | 4.1% | 20.9% | -1.8% | |
| No. of Awards | 0.0% | 0.0% | -100.0% | | | 0.0% | 0.0% | 0.0% | 0.0% | |
| Average Awards | 7.0% | 6.4% | | | | -27.1% | 4.1% | 20.9% | -1.8% | |
| LANKENAU MEDICAL RESEARCH CENTER | | | | | | | | | | |
| Total Awards | 476.4% | 107.0% | -11.9% | 7.9% | -28.6% | 20.2% | 20.0% | 9.6% | 10.3% | 145.6% |
| No. of Awards | 66.7% | 80.0% | -11.1% | 0.0% | -25.0% | 0.0% | 50.0% | -11.1% | 12.5% | 22.2% |
| Average Awards | 245.8% | 15.0% | -0.9% | 7.9% | -4.9% | 20.2% | -20.0% | 23.3% | -1.9% | 41.1% |
| LAUREL HIGHLANDS HEALTH SCIENCES LIBRARY | | | | | | | | | | |
| Total Awards | | | | | | -100.0% | | | | |
| No. of Awards | | | | | | -100.0% | | | | |
| Average Awards | | | | | | | | | | |
| LEHIGH UNIVERSITY | | | | | | | | | | |
| Total Awards | 15.3% | -10.8% | 18.0% | -16.7% | -25.2% | 36.1% | -20.5% | 41.1% | 28.0% | 5.3% |
| No. of Awards | 0.0% | -20.0% | 0.0% | 0.0% | -25.0% | 16.7% | -28.6% | 20.0% | 16.7% | -3.3% |
| Average Awards | 15.3% | 11.5% | 18.0% | -16.7% | -0.2% | 16.7% | 11.3% | 17.6% | 9.7% | 12.3% |
| LIFESPAN TECHNOLOGY | | | | | | | | | | |
| Total Awards | | | | | 62.0% | -100.0% | | | | |
| No. of Awards | | | | | 0.0% | -100.0% | | | | |
| Average Awards | | | | | 62.0% | | | | | |

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|---|---|---|---|---|---|---|---|---|---|---|
| LINCOLN UNIVERSITY | | | | | | | | | | |
| Total Awards | -8.9% | -50.9% | -22.6% | 25.1% | 9.3% | -21.6% | 26.3% | 33.8% | 31.6% | -1.9% |
| No. of Awards | 0.0% | -50.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 100.0% | 0.0% |
| Average Awards | -8.9% | -1.7% | -22.6% | 25.1% | 9.3% | -21.6% | 26.3% | 33.8% | -34.2% | -1.9% |
| MAGAININ PHARMACEUTICALS, INC. | | | | | | | | | | |
| Total Awards | 0.0% | 400.0% | 0.0% | -100.0% | | | | | | |
| No. of Awards | 0.0% | 0.0% | 0.0% | -100.0% | | | | | | |
| Average Awards | 0.0% | 400.0% | 0.0% | | | | | | | |
| MAGEE-WOMEN'S HOSPITAL | | | | | | | | | | |
| Total Awards | -8.0% | 0.1% | 6.4% | 75.7% | 31.7% | 86.2% | 6.5% | 53.5% | 15.8% | 77.8% |
| No. of Awards | 18.2% | -23.1% | -10.0% | 11.1% | 30.0% | 23.1% | 18.8% | 31.6% | 16.0% | 18.2% |
| Average Awards | -22.1% | 30.2% | 18.2% | 58.2% | 1.3% | 51.3% | -10.3% | 16.7% | -0.1% | 22.6% |
| MATREYA, INC. | | | | | | | | | | |
| Total Awards | | | | -100.0% | | | | | | |
| No. of Awards | | | | -100.0% | | | | | | |
| Average Awards | | | | | | | | | | |
| MEDICAL SYSTEMS ASSOCIATES, INC. | | | | | | | | | | |
| Total Awards | | | | | | | | -54.6% | -100.0% | |
| No. of Awards | | | | | | | | -50.0% | -100.0% | |
| Average Awards | | | | | | | | -9.3% | | |
| MEDIMATRIX, INC. | | | | | | | | | | |
| Total Awards | 92.7% | -100.0% | | | -4.8% | -100.0% | | | | |
| No. of Awards | 0.0% | -100.0% | | | 0.0% | -100.0% | | | | |
| Average Awards | 92.7% | | | | -4.8% | | | | | |
| MELLON PITTS CORPORATION (MPC) | | | | | | | | | | |
| Total Awards | 0.2% | 52.2% | 1.5% | 0.4% | 0.2% | 1.1% | -32.9% | 49.8% | 38.6% | 13.2% |
| No. of Awards | 0.0% | 100.0% | 0.0% | 25.0% | 0.0% | -40.0% | 33.3% | -25.0% | 66.7% | 16.7% |
| Average Awards | 0.2% | -23.9% | 1.5% | -19.7% | 0.2% | 68.5% | -49.7% | 99.7% | -16.8% | -1.4% |
| MERCY CATHOLIC MEDICAL CENTER | | | | | | | | | | |
| Total Awards | -96.6% | -100.0% | | 159.5% | -46.2% | -100.0% | | | | |
| No. of Awards | -50.0% | -100.0% | | 0.0% | 0.0% | -100.0% | | | | |
| Average Awards | -93.2% | | | 159.5% | -46.2% | | | | | |
| MERCY HOSPITAL (SCRANTON, PA) | | | | | | | | | | |
| Total Awards | -100.0% | | 126.1% | 27.3% | 19.4% | -19.5% | -8.2% | -100.0% | | |
| No. of Awards | -100.0% | | 0.0% | 0.0% | 0.0% | 0.0% | -100.0% | | | |
| Average Awards | | | 126.1% | 27.3% | 19.4% | -19.5% | | | | |
| MERCY HOSPITAL OF PITTSBURGH | | | | | | | | | | |
| Total Awards | | | | 6.0% | 6.0% | 103.0% | -18.0% | 4.6% | 241.6% | |
| No. of Awards | | | | 0.0% | 0.0% | 100.0% | -50.0% | 100.0% | 50.0% | |
| Average Awards | | | | 6.0% | 6.0% | 1.5% | 64.0% | -47.7% | 127.7% | |

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|---|---|---|---|---|---|---|---|---|---|---|
| MESSAGE PHARMACEUTICALS, INC. | | | | | | | | | | |
| Total Awards | | | | | | | | | | |
| No. of Awards | | | | | | | | | | |
| Average Awards | | | | | | | | | | |
| METAMORPHIC SURGICAL DEVICES | | | | | | | | | | |
| Total Awards | | | | | | | | -100.0% | | |
| No. of Awards | | | | | | | | -100.0% | | |
| Average Awards | | | | | | | | | | |
| MICROSIGNAL CORPORATION | | | | | | | | | | |
| Total Awards | | | | | | -100.0% | | | | |
| No. of Awards | | | | | | -100.0% | | | | |
| Average Awards | | | | | | | | | | |
| MOBERG MEDICAL, INC. | | | | | | | | | | |
| Total Awards | | | | | 100.0% | 0.0% | 447.1% | -45.7% | -100.0% | |
| No. of Awards | | | | | 0.0% | 0.0% | 100.0% | -50.0% | -100.0% | |
| Average Awards | | | | | 100.0% | 0.0% | 173.6% | 8.5% | | |
| MOBERG RESEARCH, INC. | | | | | | | | | | |
| Total Awards | | | | | | | | | | |
| No. of Awards | | | | | | | | | | |
| Average Awards | | | | | | | | | | |
| MOLECULAR TARGETING TECHNOLOGY, INC. | | | | | | | | | | |
| Total Awards | | | | | | | -100.0% | | | |
| No. of Awards | | | | | | | -100.0% | | | |
| Average Awards | | | | | | | | | | |
| MONELL CHEMICAL SENSES CENTER | | | | | | | | | | |
| Total Awards | 14.6% | 3.9% | -0.4% | 27.4% | -5.2% | -10.1% | -3.2% | -5.2% | 13.3% | 3.8% |
| No. of Awards | 9.1% | 0.0% | -4.2% | 17.4% | -14.8% | -8.7% | 4.8% | -9.1% | 5.0% | -0.5% |
| Average Awards | 5.0% | 3.9% | 4.0% | 8.5% | 11.3% | -1.5% | -7.6% | 4.3% | 7.9% | 4.5% |
| MONITEC, INC. | | | | | | | | | | |
| Total Awards | | | | | | | | -100.0% | | |
| No. of Awards | | | | | | | | -100.0% | | |
| Average Awards | | | | | | | | | | |
| MONTEFIORE UNIVERSITY HOSPITAL | | | | | | | | | | |
| Total Awards | -36.7% | 121.0% | -89.1% | -28.1% | -84.4% | -100.0% | | | | |
| No. of Awards | 0.0% | 50.0% | -66.7% | -75.0% | 0.0% | -100.0% | | | | |
| Average Awards | -36.7% | 47.3% | -67.3% | 187.5% | -84.4% | | | | | |
| MOSS REHABILITATION HOSPITAL | | | | | | | | | | |
| Total Awards | 25.0% | 106.6% | 250.7% | 66.3% | 6.1% | 13.1% | 5.6% | -33.9% | 21.0% | 158.5% |
| No. of Awards | 0.0% | 100.0% | 50.0% | 66.7% | 0.0% | -20.0% | -25.0% | 0.0% | 66.7% | 44.4% |
| Average Awards | 25.0% | 3.3% | 133.8% | -0.2% | 6.1% | 41.4% | 40.8% | -33.9% | -27.4% | 22.8% |

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|---|---|---|---|---|---|---|---|---|---|---|
| NATIONAL DISEASE RESEARCH INTERCHANGE | | | | | | | | | | |
| Total Awards | 58.5% | -4.0% | -2.0% | -12.4% | -2.2% | 2.7% | -11.8% | -52.2% | -10.4% | -5.6% |
| No. of Awards | 50.0% | -33.3% | 50.0% | -33.3% | -50.0% | 100.0% | 0.0% | -50.0% | -100.0% | -11.1% |
| Average Awards | 5.7% | 44.0% | -34.7% | 31.5% | 95.5% | -48.7% | -11.8% | -4.4% | | |
| NATIONAL UNDERGROUND STORAGE | | | | | | | | | | |
| Total Awards | -32.8% | 0.0% | 0.2% | 104.0% | 50.6% | 33.5% | -10.1% | 29.2% | -1.0% | 24.2% |
| No. of Awards | 0.0% | 0.0% | 0.0% | 0.0% | 100.0% | 0.0% | 0.0% | 0.0% | 0.0% | 11.1% |
| Average Awards | -32.8% | 0.0% | 0.2% | 104.0% | -24.7% | 33.5% | -10.1% | 29.2% | -1.0% | 6.5% |
| NEO GEN SCREENING, INC. | | | | | | | | | | |
| Total Awards | | | | | | | | -6.0% | 303.4% | |
| No. of Awards | | | | | | | | 0.0% | 0.0% | |
| Average Awards | | | | | | | | -6.0% | 303.4% | |
| NIM, INC. | | | | | | | | | | |
| Total Awards | 56.9% | -11.7% | -14.6% | -100.0% | | 288.0% | -21.4% | -50.1% | 6.1% | |
| No. of Awards | 200.0% | -66.7% | 200.0% | -100.0% | | 0.0% | -33.3% | -50.0% | 0.0% | |
| Average Awards | -47.7% | 164.9% | -71.5% | | | 288.0% | 17.9% | -0.2% | 6.1% | |
| ONCOLOGY NURSING SOCIETY | | | | | | | | | | |
| Total Awards | -34.1% | -86.1% | 112.7% | 157.5% | -37.5% | -100.0% | | | 2.2% | |
| No. of Awards | 0.0% | -50.0% | 100.0% | 0.0% | 0.0% | -100.0% | | | 0.0% | |
| Average Awards | -34.1% | -72.2% | 6.3% | 157.5% | -37.5% | | | | 2.2% | |
| OPTICAL DEVICES, INC. | | | | | | | | | | |
| Total Awards | | | | | | | | | | |
| No. of Awards | | | | | | | | | | |
| Average Awards | | | | | | | | | | |
| ORNITHINE DECARBOXYLASE(ODC)MOUSE GROUP | | | | | | | | | | |
| Total Awards | | | | | | | | | | |
| No. of Awards | | | | | | | | | | |
| Average Awards | | | | | | | | | | |
| OTSUKA ELECTRONICS, USA | | | | | | | | | | |
| Total Awards | -100.0% | | | | | | | | | |
| No. of Awards | -100.0% | | | | | | | | | |
| Average Awards | | | | | | | | | | |
| PENNSYLVANIA COLLEGE OF OPTOMETRY | | | | | | | | | | |
| Total Awards | 92.7% | -10.5% | -33.2% | 63.8% | 46.6% | -15.8% | -81.9% | 172.5% | 130.3% | 18.4% |
| No. of Awards | 25.0% | 20.0% | -16.7% | 0.0% | 0.0% | -40.0% | -66.7% | 100.0% | 100.0% | 0.0% |
| Average Awards | 54.2% | -25.4% | -19.8% | 63.8% | 46.6% | 40.3% | -45.6% | 36.3% | 15.1% | 18.4% |
| PENNSYLVANIA COLLEGE OF PODIATRIC MED | | | | | | | | | | |
| Total Awards | | | | -100.0% | | | | -100.0% | | |
| No. of Awards | | | | -100.0% | | | | -100.0% | | |
| Average Awards | | | | | | | | | | |

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|---|---|---|---|---|---|---|---|---|---|---|
| PENNSYLVANIA HOSPITAL (PHILADELPHIA) | | | | | | | | | | |
| Total Awards | -17.4% | 6.0% | -27.9% | 4.5% | -100.0% | | | | | |
| No. of Awards | -20.0% | -50.0% | -50.0% | 0.0% | -100.0% | | | | | |
| Average Awards | 3.2% | 112.0% | 44.2% | 4.5% | | | | | | |
| PENNSYLVANIA OFFICE OF MENTAL HEALTH | | | | | | | | | | |
| Total Awards | | 17.8% | 96.9% | -100.0% | | | | | | |
| No. of Awards | | 0.0% | 100.0% | -100.0% | | | | | | |
| Average Awards | | 17.8% | -1.5% | | | | | | | |
| PENNSYLVANIA STATE DEPT OF HEALTH | | | | | | | | | | |
| Total Awards | -36.5% | 72.4% | 27.6% | -64.6% | -88.4% | -1.2% | -100.0% | | | |
| No. of Awards | -50.0% | 100.0% | 0.0% | -50.0% | 0.0% | 0.0% | -100.0% | | | |
| Average Awards | 26.9% | -13.8% | 27.6% | -29.3% | -88.4% | -1.2% | | | | |
| PENNSYLVANIA STATE DEPT OF PUBL WELFARE | | | | | | | | | | |
| Total Awards | -1.9% | 2.4% | -94.9% | -100.0% | | | -100.0% | | | |
| No. of Awards | 0.0% | 0.0% | -100.0% | | | | -100.0% | | | |
| Average Awards | -1.9% | 2.4% | | | | | | | | |
| PENNSYLVANIA STATE UNIV HERSHEY MED CTR | | | | | | | | | | |
| Total Awards | 15.1% | 7.8% | 20.4% | -1.6% | 0.6% | 8.1% | 19.6% | -9.3% | 9.0% | 9.9% |
| No. of Awards | 3.3% | 10.8% | 5.8% | 0.0% | -5.5% | 6.8% | 5.5% | 11.2% | 1.6% | 5.1% |
| Average Awards | 11.4% | -2.7% | 13.8% | -1.6% | 6.5% | 1.3% | 13.4% | -18.4% | 7.4% | 3.3% |
| PENNSYLVANIA STATE UNIVERSITY-UNIV PARK | | | | | | | | | | |
| Total Awards | 19.0% | 13.7% | 17.3% | -2.8% | 18.5% | 5.8% | 10.8% | 14.9% | 0.4% | 16.4% |
| No. of Awards | 2.0% | 11.0% | 3.6% | -9.6% | 20.2% | 3.2% | 0.0% | 7.8% | 1.4% | 4.9% |
| Average Awards | 16.7% | 2.4% | 13.2% | 7.4% | -1.4% | 2.5% | 10.8% | 6.6% | -1.0% | 8.0% |
| PHILADELPHIA BIOMEDICAL RESEARCH INST | | | | | | | | | | |
| Total Awards | | -100.0% | | -12.3% | -17.8% | -100.0% | | | | |
| No. of Awards | | -100.0% | | 0.0% | 0.0% | -100.0% | | | | |
| Average Awards | | | | -12.3% | -17.8% | | | | | |
| PHILADELPHIA CHILD GUIDANCE CLINIC | | | | | | | | | | |
| Total Awards | | | | | | 14.0% | -100.0% | | 20.2% | |
| No. of Awards | | | | | | 0.0% | -100.0% | | 0.0% | |
| Average Awards | | | | | | 14.0% | | | 20.2% | |
| PHILADELPHIA COLLEGE OF OSTEOPATHIC MED | | | | | | | | | | |
| Total Awards | | 37.9% | 2.6% | -100.0% | | | -59.0% | 24.3% | 131.2% | |
| No. of Awards | | 100.0% | -50.0% | -100.0% | | | -33.3% | -50.0% | 100.0% | |
| Average Awards | | -31.0% | 105.1% | | | | -38.5% | 148.6% | 15.6% | |
| PHILADELPHIA FIGHT | | | | | | | | | | |
| Total Awards | | | | | | 57.7% | -55.3% | 130.9% | 4.0% | |
| No. of Awards | | | | | | 0.0% | 0.0% | 0.0% | 0.0% | |
| Average Awards | | | | | | 57.7% | -55.3% | 130.9% | 4.0% | |

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| PHILADELPHIA GERIATRIC CTR-FRIEDMAN HOSP | | | | | | | | | | |
| Total Awards | -39.9% | 20.4% | 24.2% | -28.1% | -4.4% | -0.9% | -4.5% | -51.9% | -58.7% | -9.8% |
| No. of Awards | 14.3% | 37.5% | 18.2% | -7.7% | -8.3% | -18.2% | 11.1% | -40.0% | -66.7% | -7.9% |
| Average Awards | -47.5% | -12.5% | 5.1% | -22.2% | 4.3% | 21.1% | -14.1% | -19.9% | 23.9% | -6.6% |
| PHILADELPHIA HEALTH MANAGEMENT CORP | | | | | | | | | | |
| Total Awards | -31.3% | 50.9% | 8.4% | -3.6% | -16.9% | -100.0% | | | | |
| No. of Awards | 100.0% | 0.0% | 0.0% | 0.0% | 0.0% | -100.0% | | | | |
| Average Awards | -65.6% | 50.9% | 8.4% | -3.6% | -16.9% | | | | | |
| POLYPROBE, INC. | | | | | | | | | | |
| Total Awards | | | | | -100.0% | | | 54.2% | -100.0% | |
| No. of Awards | | | | | -100.0% | | | 0.0% | -100.0% | |
| Average Awards | | | | | | | | 54.2% | | |
| POLYSCIENCES, INC. | | | | | | | | | | |
| Total Awards | -98.2% | -100.0% | | -100.0% | | | | | | |
| No. of Awards | -50.0% | -100.0% | | -100.0% | | | | | | |
| Average Awards | -96.3% | | | | | | | | | |
| PRESBYTERIAN MEDICAL CENTER OF PHILA | | | | | | | | | | |
| Total Awards | -44.0% | 17.0% | -18.1% | 25.1% | -26.8% | 67.6% | -84.1% | -100.0% | | |
| No. of Awards | -27.3% | -12.5% | -28.6% | -20.0% | 50.0% | 0.0% | -66.7% | -100.0% | | |
| Average Awards | -23.0% | 33.7% | 14.7% | 56.3% | -51.2% | 67.6% | -52.4% | | | |
| PRESERVATION RESOURCES | | | | | | | | | | |
| Total Awards | | -100.0% | | | | | 64.5% | 47.7% | -27.4% | |
| No. of Awards | | -100.0% | | | | | 0.0% | 0.0% | 0.0% | |
| Average Awards | | | | | | | 64.5% | 47.7% | -27.4% | |
| PREVENTIVE MEDICAL TECHNOLOGIES, INC. | | | | | | | | | | |
| Total Awards | | | | | | | | | | |
| No. of Awards | | | | | | | | | | |
| Average Awards | | | | | | | | | | |
| PROLX PHARMACEUTICALS, INC. | | | | | | | | | | |
| Total Awards | | | | | | | | | 98.0% | |
| No. of Awards | | | | | | | | | 0.0% | |
| Average Awards | | | | | | | | | 98.0% | |
| PROVAC, INC. | | | | | | | | | | |
| Total Awards | | -100.0% | | | | | | | | |
| No. of Awards | | -100.0% | | | | | | | | |
| Average Awards | | | | | | | | | | |
| PSYCHOLOGY SOFTWARE TOOLS, INC. | | | | | | | | | | |
| Total Awards | | | | | -100.0% | | | | 371.9% | |
| No. of Awards | | | | | -100.0% | | | | 100.0% | |
| Average Awards | | | | | | | | | 135.9% | |

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|---|---|---|---|---|---|---|---|
| PUBLIC/PRIVATE VENTURES | | | | | | | |
| Total Awards | | | | -100.0% | | | |
| No. of Awards | | | | -100.0% | | | |
| Average Awards | | | | | | | |
| PURESYN, INC. | | | | | | | |
| Total Awards | | | | | | | -100.0% |
| No. of Awards | | | | | | | -100.0% |
| Average Awards | | | | | | | |
| Q-CHEM, INC. | | | | | | | |
| Total Awards | | | | | | | |
| No. of Awards | | | | | | | |
| Average Awards | | | | | | | |
| QDOT CORPORATION | | | | | | | |
| Total Awards | | | | | | | -100.0% |
| No. of Awards | | | | | | | -100.0% |
| Average Awards | | | | | | | |
| QED COMMUNICATIONS, INC. | | | | | | | |
| Total Awards | | | 3.7% | -100.0% | | | |
| No. of Awards | | | 0.0% | -100.0% | | | |
| Average Awards | | | 3.7% | | | | |
| QED IMAGING, INC. | | | | | | | |
| Total Awards | | | | | | | |
| No. of Awards | | | | | | | |
| Average Awards | | | | | | | |
| RJ LEE GROUP | | | | | | | |
| Total Awards | -42.7% | -100.0% | | | | | |
| No. of Awards | -50.0% | -100.0% | | | | | |
| Average Awards | 14.6% | | | | | | |
| ROBERT PACKER HOSPITAL | | | | | | | |
| Total Awards | | | -13.4% | -100.0% | | | |
| No. of Awards | | | 0.0% | -100.0% | | | |
| Average Awards | | | -13.4% | | | | |
| SACRED HEART HOSPITAL | | | | | | | |
| Total Awards | | | -100.0% | | | | |
| No. of Awards | | | -100.0% | | | | |
| Average Awards | | | | | | | |
| SEER SYSTEMS, INC. | | | | | | | |
| Total Awards | | | | | -100.0% | | |
| No. of Awards | | | | | -100.0% | | |
| Average Awards | | | | | | | |

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| SERVICEWARE, INC. | | | | | | | | | |
| Total Awards | | | | | | | -100.0% | | |
| No. of Awards | | | | | | | -100.0% | | |
| Average Awards | | | | | | | | | |
| SHIPPENSBURG UNIVERSITY OF PENNSYLVANIA | | | | | | | | | |
| Total Awards | | | | -100.0% | | | | | |
| No. of Awards | | | | -100.0% | | | | | |
| Average Awards | | | | | | | | | |
| SMITHKLINE BEECHAM PHARMACEUTICALS | | | | | | | | | |
| Total Awards | | | 49.4% | -100.0% | | 4.0% | 67.9% | 18.5% | -100.0% |
| No. of Awards | | | 0.0% | -100.0% | | 0.0% | 100.0% | 0.0% | -100.0% |
| Average Awards | | | 49.4% | | | 4.0% | -16.1% | 18.5% | |
| SMITHKLINE BEECHAM, PLC | | | | | | | | | |
| Total Awards | -100.0% | | -100.0% | | | | | | |
| No. of Awards | -100.0% | | -100.0% | | | | | | |
| Average Awards | | | | | | | | | |
| SONIC TECHNOLOGIES | | | | | | | | | |
| Total Awards | | 0.4% | 2.5% | 297.9% | -48.3% | 159.6% | -2.0% | -100.0% | |
| No. of Awards | | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | -100.0% | |
| Average Awards | | 0.4% | 2.5% | 297.9% | -48.3% | 159.6% | -2.0% | | |
| SPARTA PHARMACEUTICAL CORPORATION | | | | | | | | | |
| Total Awards | | | | | | 122.9% | -53.8% | 393.3% | 2.4% |
| No. of Awards | | | | | | 100.0% | -50.0% | 0.0% | 100.0% |
| Average Awards | | | | | | 11.5% | -7.5% | 393.3% | -48.8% |
| SPECTRASONICS IMAGING | | | | | | | | | |
| Total Awards | | | | | | | -100.0% | | 3.3% |
| No. of Awards | | | | | | | -100.0% | | 100.0% |
| Average Awards | | | | | | | | | -48.4% |
| ST. JOSEPH'S UNIVERSITY | | | | | | | | | |
| Total Awards | -100.0% | | | -100.0% | | | -100.0% | | |
| No. of Awards | -100.0% | | | -100.0% | | | -100.0% | | |
| Average Awards | | | | | | | | | |
| ST. PETER'S CHILD DEVELOPMENT CENTERS | | | | | | | | | |
| Total Awards | | | | | | -100.0% | | | |
| No. of Awards | | | | | | -100.0% | | | |
| Average Awards | | | | | | | | | |
| STC TECHNOLOGIES, INC. | | | | | | | | | |
| Total Awards | | | | | | | | | -100.0% |
| No. of Awards | | | | | | | | | -100.0% |
| Average Awards | | | | | | | | | |

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| STEMCELL THERAPEUTICS, LLC | | | | | | | | | |
| Total Awards | | | | | | | | | -100.0% |
| No. of Awards | | | | | | | | | -100.0% |
| Average Awards | | | | | | | | | |
| STONY BROOK SCIENTIFIC, LTD. | | | | | | | | | |
| Total Awards | | | | -100.0% | | | | | |
| No. of Awards | | | | -100.0% | | | | | |
| Average Awards | | | | | | | | | |
| SUSQUEHANNA HEALTH SYSTEM | | | | | | | | | |
| Total Awards | | | | | | | | -100.0% | |
| No. of Awards | | | | | | | | -100.0% | |
| Average Awards | | | | | | | | | |
| SUSQUEHANNA UNIVERSITY | | | | | | | | | |
| Total Awards | | | | | -100.0% | | | 32.1% | -75.5% |
| No. of Awards | | | | | -100.0% | | | 100.0% | -50.0% |
| Average Awards | | | | | | | | -33.9% | -51.1% |
| SWARTHMORE COLLEGE | | | | | | | | | |
| Total Awards | | | -100.0% | | | | | -100.0% | |
| No. of Awards | | | -100.0% | | | | | -100.0% | |
| Average Awards | | | | | | | | | |
| SWETS SUBSCRIPTION SERVICE | | | | | | | | | |
| Total Awards | | | | | | | | | 2551.8% |
| No. of Awards | | | | | | | | | 0.0% |
| Average Awards | | | | | | | | | 2551.8% |
| SYMPOSIA, INC. | | | | | | | | | |
| Total Awards | | | -100.0% | | | | | | |
| No. of Awards | | | -100.0% | | | | | | |
| Average Awards | | | | | | | | | |
| SYNCHROTRONICS, INC. | | | | | | | | | |
| Total Awards | | -73.9% | -100.0% | | | | | | |
| No. of Awards | | 0.0% | -100.0% | | | | | | |
| Average Awards | | -73.9% | | | | | | | |
| TELEFACTOR CORPORATION | | | | | | | | | |
| Total Awards | -100.0% | | | 0.0% | 551.1% | 85.2% | 36.6% | -42.1% | -79.1% |
| No. of Awards | -100.0% | | | 0.0% | 100.0% | 0.0% | 50.0% | -33.3% | -50.0% |
| Average Awards | | | | 0.0% | 225.6% | 85.2% | -8.9% | -13.2% | -58.2% |
| TELEGRAPHIQUES | | | | | | | | | |
| Total Awards | | -100.0% | | | | | | | |
| No. of Awards | | -100.0% | | | | | | | |
| Average Awards | | | | | | | | | |

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|---|---|---|---|---|---|---|---|---|---|---|
| TEMPLE UNIVERSITY | | | | | | | | | | |
| Total Awards | 18.9% | -18.0% | 10.1% | 1.1% | 6.2% | 0.3% | -8.9% | 5.4% | 9.9% | 2.4% |
| No. of Awards | 1.8% | -12.1% | -5.9% | -3.1% | 4.3% | 2.1% | -2.0% | 0.0% | -2.1% | -1.9% |
| Average Awards | 16.9% | -6.7% | 17.0% | 4.4% | 1.8% | -1.8% | -7.0% | 5.4% | 12.3% | 5.1% |
| THAR DESIGNS, INC. | | | | | | | | | | |
| Total Awards | | | | | | -100.0% | | | | |
| No. of Awards | | | | | | -100.0% | | | | |
| Average Awards | | | | | | | | | | |
| THERACHEM RESEARCH | | | | | | | | | | |
| Total Awards | | | | | | | | | -100.0% | |
| No. of Awards | | | | | | | | | -100.0% | |
| Average Awards | | | | | | | | | | |
| THOMAS JEFFERSON UNIVERSITY | | | | | | | | | | |
| Total Awards | -3.1% | 37.9% | 24.7% | 17.3% | 17.2% | 9.6% | 4.3% | -0.3% | 10.5% | 20.9% |
| No. of Awards | -4.6% | 22.3% | 20.6% | 4.6% | 16.4% | 4.3% | 0.0% | 5.2% | 3.9% | 10.6% |
| Average Awards | 1.6% | 12.7% | 3.4% | 12.1% | 0.7% | 5.1% | 4.3% | -5.2% | 6.3% | 5.3% |
| THREE-DIMENSIONAL PHARMACEUTICALS, INC. | | | | | | | | | | |
| Total Awards | | | | | | | 112.4% | 0.0% | -100.0% | |
| No. of Awards | | | | | | | -50.0% | 0.0% | -100.0% | |
| Average Awards | | | | | | | 324.8% | 0.0% | | |
| TOTTS GAP MEDICAL RESEARCH LABORATORIES | | | | | | | | | | |
| Total Awards | | | | | -100.0% | | | -100.0% | | |
| No. of Awards | | | | | -100.0% | | | -100.0% | | |
| Average Awards | | | | | | | | | | |
| TRANSICOIL, INC. | | | | | | | | | | |
| Total Awards | | | | | | | 26.0% | 10.4% | -46.4% | |
| No. of Awards | | | | | | | 0.0% | 0.0% | 0.0% | |
| Average Awards | | | | | | | 26.0% | 10.4% | -46.4% | |
| U.S. BIOSCIENCE, INC. | | | | | | | | | | |
| Total Awards | | | | | | | | | 4.0% | |
| No. of Awards | | | | | | | | | 0.0% | |
| Average Awards | | | | | | | | | 4.0% | |
| UGM LABORATORY, INC. | | | | | | | | | | |
| Total Awards | | | | | | | -100.0% | | | |
| No. of Awards | | | | | | | -100.0% | | | |
| Average Awards | | | | | | | | | | |
| UGM MEDICAL SYSTEMS, INC. | | | | | | | | | | |
| Total Awards | | 64.2% | -49.7% | -80.0% | 50.0% | 260.0% | -8.4% | -100.0% | | |
| No. of Awards | | 0.0% | -50.0% | 0.0% | 0.0% | 0.0% | 0.0% | -100.0% | | |
| Average Awards | | 64.2% | 0.6% | -80.0% | 50.0% | 260.0% | -8.4% | | | |

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| ULTRA VOICE | | | | | | | | | | |
| Total Awards | | | -100.0% | | | | -15.1% | -100.0% | | |
| No. of Awards | | | -100.0% | | | | 0.0% | -100.0% | | |
| Average Awards | | | | | | | -15.1% | | | |
| UNISYS | | | | | | | | | | |
| Total Awards | 6.9% | -100.0% | | | | | -24.8% | 5.9% | -100.0% | |
| No. of Awards | 0.0% | -100.0% | | | | | 0.0% | 0.0% | -100.0% | |
| Average Awards | 6.9% | | | | | | -24.8% | 5.9% | | |
| UNIVERSITY CITY SCIENCE CENTER | | | | | | | | | | |
| Total Awards | -29.1% | -7.4% | -5.6% | 2.3% | -47.2% | 9.8% | -23.6% | -61.3% | 21.5% | -9.6% |
| No. of Awards | -26.3% | -7.1% | -38.5% | 12.5% | -22.2% | -14.3% | -50.0% | 33.3% | 0.0% | -8.8% |
| Average Awards | -3.8% | -0.3% | 53.4% | -9.1% | -32.1% | 28.1% | 52.8% | -71.0% | 21.5% | -4.1% |
| UNIVERSITY OF PENNSYLVANIA | | | | | | | | | | |
| Total Awards | 8.8% | 12.1% | 6.8% | 3.2% | 8.1% | 9.7% | 7.1% | 16.2% | 13.4% | 13.9% |
| No. of Awards | 7.8% | 6.7% | -1.5% | 2.4% | 10.7% | 5.3% | 6.0% | 6.0% | 10.1% | 7.5% |
| Average Awards | 0.9% | 5.1% | 8.5% | 0.8% | -2.4% | 4.2% | 1.0% | 9.7% | 3.0% | 3.9% |
| UNIVERSITY OF PITTSBURGH AT PITTSBURGH | | | | | | | | | | |
| Total Awards | 14.9% | 18.9% | 22.9% | 0.4% | -1.4% | 11.2% | -2.8% | 11.5% | 11.3% | 13.7% |
| No. of Awards | 2.1% | 14.8% | 6.1% | -1.9% | 7.6% | 2.2% | 5.1% | 2.6% | 6.2% | 6.0% |
| Average Awards | 12.5% | 3.6% | 15.8% | 2.4% | -8.4% | 8.8% | -7.5% | 8.6% | 4.8% | 5.0% |
| UNIVERSITY OF SCRANTON | | | | | | | | | | |
| Total Awards | | | | -100.0% | | | | | -100.0% | |
| No. of Awards | | | | -100.0% | | | | | -100.0% | |
| Average Awards | | | | | | | | | | |
| UNIVERSITY OF THE SCIENCES PHILADELPHIA | | | | | | | | | | |
| Total Awards | -13.1% | -12.9% | -69.4% | 3.0% | 409.1% | -9.4% | -42.4% | -20.4% | 61.0% | -2.1% |
| No. of Awards | 0.0% | 0.0% | -66.7% | 0.0% | 300.0% | 0.0% | -25.0% | -33.3% | 50.0% | 0.0% |
| Average Awards | -13.1% | -12.9% | -8.3% | 3.0% | 27.3% | -9.4% | -23.3% | 19.5% | 7.3% | -2.1% |
| VILLANOVA UNIVERSITY | | | | | | | | | | |
| Total Awards | 40.0% | -40.4% | 3.9% | -2.1% | -0.5% | -35.5% | -43.6% | -100.0% | | |
| No. of Awards | 20.0% | -16.7% | -20.0% | -25.0% | -33.3% | -50.0% | 0.0% | -100.0% | | |
| Average Awards | 16.7% | -28.4% | 29.9% | 30.5% | 49.3% | 29.0% | -43.6% | | | |
| VIRAL THERAPEUTICS, INC. | | | | | | | | | | |
| Total Awards | | | | | | | | -100.0% | | |
| No. of Awards | | | | | | | | -100.0% | | |
| Average Awards | | | | | | | | | | |
| VIROPHARMA, INC. | | | | | | | | | | |
| Total Awards | | | | | | | 2.3% | -100.0% | | |
| No. of Awards | | | | | | | 0.0% | -100.0% | | |
| Average Awards | | | | | | | 2.3% | | | |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| VISITING NURSES ASSOCIATION SRVS & FDN | | | | | | | | | | |
| Total Awards | | | | | | | | | | |
| No. of Awards | | | | | | | | | | |
| Average Awards | | | | | | | | | | |
| WALTERS SCIENTIFIC INSTRUMENT LABS | | | | | | | | | | |
| Total Awards | | | | | | 16.5% | -100.0% | | | |
| No. of Awards | | | | | | 0.0% | -100.0% | | | |
| Average Awards | | | | | | 16.5% | | | | |
| WEIS CENTER FOR RESEARCH-GEISINGER CLNIC | | | | | | | | | | |
| Total Awards | 230.7% | 139.8% | 76.2% | 80.5% | -1.2% | 1.0% | -28.1% | -41.9% | -79.8% | 12.4% |
| No. of Awards | 200.0% | 133.3% | 57.1% | 63.6% | 0.0% | -11.1% | -12.5% | -42.9% | -87.5% | 0.0% |
| Average Awards | 10.2% | 2.8% | 12.1% | 10.3% | -1.2% | 13.6% | -17.8% | 1.6% | 61.3% | 12.4% |
| WEST CHESTER UNIVERSITY OF PENNSYLVANIA | | | | | | | | | | |
| Total Awards | -100.0% | | | 3.4% | -100.0% | | | | | |
| No. of Awards | -100.0% | | | 0.0% | -100.0% | | | | | |
| Average Awards | | | | 3.4% | | | | | | |
| WESTERN PENNSYLVANIA HOSPITAL | | | | | | | | | | |
| Total Awards | | 31.0% | 5.3% | 7.4% | -100.0% | | | | | |
| No. of Awards | | 0.0% | 0.0% | 0.0% | -100.0% | | | | | |
| Average Awards | | 31.0% | 5.3% | 7.4% | | | | | | |
| WIDENER UNIVERSITY PENNYSLVANIA CAMPUS | | | | | | | | | | |
| Total Awards | | | -100.0% | | | | | | | |
| No. of Awards | | | -100.0% | | | | | | | |
| Average Awards | | | | | | | | | | |
| WILHELMY FINE PARTICLES | | | | | | | | | | |
| Total Awards | | | | -100.0% | | | | | | |
| No. of Awards | | | | -100.0% | | | | | | |
| Average Awards | | | | | | | | | | |
| WILLS EYE HOSPITAL (PHILADELPHIA) | | | | | | | | | | |
| Total Awards | -45.4% | -0.7% | -58.2% | 37.6% | 13.0% | 64.4% | -22.4% | -44.2% | -6.2% | -8.5% |
| No. of Awards | -40.0% | 0.0% | -66.7% | 50.0% | 33.3% | 0.0% | -25.0% | -33.3% | 0.0% | -8.9% |
| Average Awards | -8.9% | -0.7% | 25.5% | -8.3% | -15.3% | 64.4% | 3.4% | -16.3% | -6.2% | 2.0% |
| WISTAR INSTITUTE | | | | | | | | | | |
| Total Awards | -5.1% | 2.5% | -11.6% | -26.0% | -15.3% | 1.3% | 2.3% | -1.1% | 23.4% | -3.5% |
| No. of Awards | -5.2% | 1.4% | -20.3% | -22.0% | -6.5% | -7.0% | -7.5% | 13.5% | 19.0% | -3.9% |
| Average Awards | 0.0% | 1.1% | 10.9% | -5.1% | -9.4% | 8.8% | 10.6% | -12.8% | 3.7% | 0.6% |
| YORK HOSPITAL (YORK, PA) | | | | | | | | | | |
| Total Awards | | | | | | | -100.0% | | | |
| No. of Awards | | | | | | | -100.0% | | | |
| Average Awards | | | | | | | | | | |

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|---|---|---|---|---|---|---|---|---|---|---|
| ZIVIC MILLER LABORATORIES, INC. | | | | | | | | | | |
| Total Awards | | | | -100.0% | | | | | | |
| No. of Awards | | | | -100.0% | | | | | | |
| Average Awards | | | | | | | | | | |
| ZYNAXIS, INC. | | | | | | | | | | |
| Total Awards | 0.0% | 446.2% | 16.6% | -100.0% | | | 34.2% | -100.0% | | |
| No. of Awards | 0.0% | 100.0% | 0.0% | -100.0% | | | 100.0% | -100.0% | | |
| Average Awards | 0.0% | 173.1% | 16.6% | | | | -32.9% | | | |
| PA TOTAL | | | | | | | | | | |
| Total Awards | 6.1% | 14.0% | 10.7% | 1.9% | 3.8% | 8.6% | 4.5% | 10.5% | 7.9% | 10.2% |
| No. of Awards | 2.5% | 9.6% | 1.0% | -1.0% | 5.2% | 3.9% | 2.3% | 6.4% | 5.0% | 4.5% |
| Average Awards | 3.5% | 4.0% | 9.6% | 2.9% | -1.4% | 4.5% | 2.2% | 3.8% | 2.8% | 4.1% |

SOURCE: Data provided by the Office of Reports and Analysis, Office of Extramural Research, National Institutes of Health, Bethesda, MD, August 1999.

APPENDIX A - 3
STATE SHARES OF TOTAL NIH AWARDS TO INDIVIDUAL PENNSYLVANIA INSTITUTIONS
Total Awards and No. of Awards
1989 to 1998

| Institution | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ACADEMY OF NATURAL SCIENCES | | | | | | | | | | | |
| Total Awards | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | | 0.0% | | 0.0% |
| No. of Awards | 0.1% | 0.1% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | | 0.0% | | 0.0% |
| ACTUARIAL FORECASTING AND RESEARCH | | | | | | | | | | | |
| Total Awards | | | | | | 0.0% | 0.1% | 0.0% | | | 0.0% |
| No. of Awards | | | | | | 0.0% | 0.0% | 0.0% | | | 0.0% |
| ADOLOR CORPORATION | | | | | | | | | | | |
| Total Awards | | | | | | | | | 0.0% | | 0.0% |
| No. of Awards | | | | | | | | | 0.0% | | 0.0% |
| ADVENT HEALTH TECHNOLOGY | | | | | | | | | | | |
| Total Awards | | | | | | | 0.0% | | | | 0.0% |
| No. of Awards | | | | | | | 0.0% | | | | 0.0% |
| AIDS COMMUNITY ALLIANCE | | | | | | | | | | | |
| Total Awards | | | | | | | | | | 0.0% | 0.0% |
| No. of Awards | | | | | | | | | | 0.0% | 0.0% |
| ALBERT EINSTEIN MED CTR (PHILADELPHIA) | | | | | | | | | | | |
| Total Awards | 0.1% | 0.1% | 0.0% | 0.0% | 0.0% | 0.1% | 0.1% | 0.1% | 0.1% | 0.0% | 0.1% |
| No. of Awards | 0.2% | 0.2% | 0.2% | 0.2% | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% | 0.0% | 0.1% |
| ALLEGHENY COLLEGE | | | | | | | | | | | |
| Total Awards | | 0.0% | 0.0% | | 0.0% | | | | | | 0.0% |
| No. of Awards | | 0.1% | 0.0% | | 0.0% | | | | | | 0.0% |
| ALLEGHENY COUNTY HUMAN SERVICES DEPT | | | | | | | | | | | |
| Total Awards | 0.2% | 0.2% | 0.1% | | | | | | | | 0.0% |
| No. of Awards | 0.1% | 0.1% | | | | | | | | | 0.0% |
| ALLEGHENY GENERAL HOSP (PITTSBURGH) | | | | | | | | | | | |
| Total Awards | | | | | 0.1% | 0.1% | 0.0% | 0.1% | 0.1% | | 0.0% |
| No. of Awards | | | | | 0.1% | 0.1% | 0.0% | 0.1% | 0.1% | | 0.0% |
| ALLEGHENY UNIVERSITY OF HEALTH SCIENCES | | | | | | | | | | | |
| Total Awards | 2.6% | 3.3% | 3.8% | 3.2% | 3.0% | 3.0% | 4.0% | 4.0% | 5.0% | 4.6% | 3.8% |
| No. of Awards | 3.1% | 3.2% | 3.6% | 3.2% | 3.2% | 3.2% | 4.6% | 4.7% | 5.7% | 5.4% | 4.1% |
| ALLEGHENY-SINGER RESEARCH INSTITUTE | | | | | | | | | | | |
| Total Awards | 0.3% | 0.3% | 0.4% | 0.3% | 0.4% | 0.3% | 0.2% | 2.2% | 2.0% | 0.5% | 0.8% |
| No. of Awards | 0.4% | 0.4% | 0.5% | 0.5% | 0.6% | 0.5% | 0.4% | 0.5% | 0.5% | 0.3% | 0.5% |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AMERICAN AGING ASSOCIATION | | | | | | | | | | | |
| Total Awards | | | | | | 0.0% | 0.0% | 0.0% | | | 0.0% |
| No. of Awards | | | | | | 0.0% | 0.0% | 0.0% | | | 0.0% |
| AMERICAN ASSOCIATION FOR CANCER RESEARCH | | | | | | | | | | | |
| Total Awards | 0.0% | 0.0% | 0.0% | 0.0% | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% |
| No. of Awards | 0.2% | 0.2% | 0.1% | 0.3% | 0.3% | 0.3% | 0.1% | 0.2% | 0.2% | 0.2% | 0.2% |
| AMERICAN COLLEGE OF PHYSICIANS | | | | | | | | | | | |
| Total Awards | | | | | | | | | 0.0% | | 0.0% |
| No. of Awards | | | | | | | | | 0.0% | | 0.0% |
| AMERICAN MOTILITY SOCIETY | | | | | | | | | | | |
| Total Awards | | 0.0% | | | | | | | | | 0.0% |
| No. of Awards | | 0.1% | | | | | | | | | 0.0% |
| ANATEK, INC. | | | | | | | | | | | |
| Total Awards | | | | | | | 0.0% | 0.0% | | | 0.0% |
| No. of Awards | | | | | | | 0.1% | 0.0% | | | 0.0% |
| ANIMAS CORPORATION | | | | | | | | | | | |
| Total Awards | | | | | | | | | | 0.0% | 0.0% |
| No. of Awards | | | | | | | | | | 0.0% | 0.0% |
| APOLLON, INC. | | | | | | | | | | | |
| Total Awards | | | | | | 0.0% | | | | | 0.0% |
| No. of Awards | | | | | | 0.0% | | | | | 0.0% |
| ARGUS RESEARCH LABORATORIES, INC. | | | | | | | | | | | |
| Total Awards | 0.0% | | | | | | | | | | 0.0% |
| No. of Awards | 0.1% | | | | | | | | | | 0.0% |
| ARRAY VISION ENGINEERING COMPANY | | | | | | | | | | | |
| Total Awards | | | | | | | 0.0% | | | | 0.0% |
| No. of Awards | | | | | | | 0.0% | | | | 0.0% |
| ARTSCO, INC. | | | | | | | | | | | |
| Total Awards | | | | | | | | 0.0% | 0.0% | 0.0% | 0.0% |
| No. of Awards | | | | | | | | 0.0% | 0.1% | 0.0% | 0.0% |
| AT BIOCHEM | | | | | | | | | | | |
| Total Awards | | | | 0.0% | | | | | | | 0.0% |
| No. of Awards | | | | 0.0% | | | | | | | 0.0% |
| AUGMENTECH, INC. | | | | | | | | | | | |
| Total Awards | | 0.0% | | | | 0.0% | 0.0% | | 0.0% | 0.1% | 0.0% |
| No. of Awards | | 0.1% | | | | 0.0% | 0.0% | | 0.0% | 0.0% | 0.0% |
| AUTOMATED CELL TECHNOLOGIES, INC. | | | | | | | | | | | |
| Total Awards | | | | | | | | | 0.0% | | 0.0% |
| No. of Awards | | | | | | | | | 0.1% | | 0.0% |

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|---|---|---|---|---|---|---|---|---|---|---|---|
| AVECON DIAGNOSTICS, INC. | | | | | | | | | | | |
| Total Awards | | | | | | | | | 0.0% | | 0.0% |
| No. of Awards | | | | | | | | | 0.0% | | 0.0% |
| AVID THERAPEUTICS, INC. | | | | | | | | | | | |
| Total Awards | | | | | 0.0% | | | | | 0.0% | 0.0% |
| No. of Awards | | | | | 0.0% | | | | | 0.0% | 0.0% |
| AVITECH DIAGNOSTICS | | | | | | | | | | | |
| Total Awards | | | | | | 0.0% | 0.1% | 0.0% | | | 0.0% |
| No. of Awards | | | | | | 0.0% | 0.0% | 0.0% | | | 0.0% |
| BEARSDEN BIO, INC. | | | | | | | | | | | |
| Total Awards | | | | | | | | 0.0% | 0.1% | 0.1% | 0.0% |
| No. of Awards | | | | | | | | 0.1% | 0.2% | 0.1% | 0.0% |
| BEAVER COLLEGE | | | | | | | | | | | |
| Total Awards | | | | | | 0.0% | 0.0% | 0.0% | 0.0% | | 0.0% |
| No. of Awards | | | | | | 0.0% | 0.0% | 0.0% | 0.0% | | 0.0% |
| BELMONT CENTER/COMPREHENSIVE TREATMENT | | | | | | | | | | | |
| Total Awards | 0.1% | 0.1% | 0.0% | | 0.0% | 0.0% | 0.0% | | | | 0.0% |
| No. of Awards | 0.1% | 0.2% | 0.0% | | 0.0% | 0.0% | 0.0% | | | | 0.0% |
| BIO MED SCIENCES, INC. | | | | | | | | | | | |
| Total Awards | | 0.0% | 0.0% | 0.0% | | | | | | | 0.0% |
| No. of Awards | | 0.1% | 0.0% | 0.0% | | | | | | | 0.0% |
| BIOFOR, INC. | | | | | | | | | | | |
| Total Awards | | | | | 0.0% | | | | | | 0.0% |
| No. of Awards | | | | | 0.0% | | | | | | 0.0% |
| BIOLOGICAL ABSTRACTS | | | | | | | | | | | |
| Total Awards | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.1% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| No. of Awards | 0.1% | 0.1% | 0.1% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| BIOMATION, LTD. | | | | | | | | | | | |
| Total Awards | | | | | | | | 0.0% | | | 0.0% |
| No. of Awards | | | | | | | | 0.0% | | | 0.0% |
| BIOMED RESEARCH AND TECHNOLOGIES, INC. | | | | | | | | | | | |
| Total Awards | | | | | | | | 0.0% | | 0.0% | 0.0% |
| No. of Awards | | | | | | | | 0.0% | | 0.0% | 0.0% |
| BIOMOL RESEARCH LABORATORIES, INC. | | | | | | | | | | | |
| Total Awards | | 0.0% | | 0.0% | 0.0% | | | | | | 0.0% |
| No. of Awards | | 0.1% | | 0.0% | 0.1% | | | | | | 0.0% |
| BIOPORE, INC. | | | | | | | | | | | |
| Total Awards | | | | | | | | | 0.0% | 0.0% | 0.0% |
| No. of Awards | | | | | | | | | 0.0% | 0.0% | 0.0% |

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|---|---|---|---|---|---|---|---|---|---|---|---|
| BIOSYN, INC. | | | | | | | | | | | |
| Total Awards | | | | | | 0.0% | | | | | 0.0% |
| No. of Awards | | | | | | 0.0% | | | | | 0.0% |
| BIPHASICS, INC. | | | | | | | | | | | |
| Total Awards | | | 0.0% | 0.0% | | | | | | | 0.0% |
| No. of Awards | | | 0.0% | 0.0% | | | | | | | 0.0% |
| BLOOMSBURG UNIVERSITY OF PENNSYLVANIA | | | | | | | | | | | |
| Total Awards | 0.0% | | | | | | | | | | 0.0% |
| No. of Awards | 0.1% | | | | | | | | | | 0.0% |
| BLUE LIGHTNING DATA AND SOFTWARE, INC. | | | | | | | | | | | |
| Total Awards | | | | | 0.0% | | | | | | 0.0% |
| No. of Awards | | | | | 0.1% | | | | | | 0.0% |
| BROUDY PRINTING, INC. | | | | | | | | | | | |
| Total Awards | | | 0.2% | | | | | | | | 0.0% |
| No. of Awards | | | 0.1% | | | | | | | | 0.0% |
| BRYN MAWR COLLEGE | | | | | | | | | | | |
| Total Awards | 0.1% | 0.1% | 0.1% | 0.1% | 0.0% | 0.1% | 0.1% | 0.1% | 0.0% | 0.0% | 0.1% |
| No. of Awards | 0.2% | 0.2% | 0.3% | 0.3% | 0.1% | 0.2% | 0.1% | 0.0% | 0.1% | 0.1% | 0.1% |
| BUCKNELL UNIVERSITY | | | | | | | | | | | |
| Total Awards | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | | | 0.0% | | 0.0% |
| No. of Awards | 0.1% | 0.1% | 0.1% | 0.0% | 0.0% | 0.0% | | | 0.1% | | 0.0% |
| C AND L INSTRUMENTS, INC. | | | | | | | | | | | |
| Total Awards | | | | | | | 0.0% | | 0.0% | 0.0% | 0.0% |
| No. of Awards | | | | | | | 0.0% | | 0.0% | 0.0% | 0.0% |
| CARDIOPULMARY TECHNOLOGIES, INC. | | | | | | | | | | | |
| Total Awards | | | | | | | | | | 0.0% | 0.0% |
| No. of Awards | | | | | | | | | | 0.1% | 0.0% |
| CARLOW COLLEGE | | | | | | | | | | | |
| Total Awards | | | | | | 0.0% | 0.0% | | 0.0% | 0.0% | 0.0% |
| No. of Awards | | | | | | 0.0% | 0.0% | | 0.0% | 0.0% | 0.0% |
| CARNEGIE-MELLON UNIVERSITY | | | | | | | | | | | |
| Total Awards | 2.0% | 1.6% | 1.8% | 1.6% | 1.9% | 1.8% | 1.6% | 1.6% | 1.6% | 1.5% | 1.7% |
| No. of Awards | 2.8% | 2.3% | 2.4% | 2.1% | 2.4% | 2.1% | 2.4% | 2.3% | 2.3% | 1.9% | 2.3% |
| CELLOMICS, INC. | | | | | | | | | | | |
| Total Awards | | | | | | | | | | 0.1% | 0.0% |
| No. of Awards | | | | | | | | | | 0.1% | 0.0% |
| CENTOCOR, INC. | | | | | | | | | | | |
| Total Awards | | | | | 0.0% | 0.0% | 0.1% | 0.0% | | | 0.0% |
| No. of Awards | | | | | 0.0% | 0.0% | 0.0% | 0.0% | | | 0.0% |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CEPHALON, INC. | | | | | | | | | | | |
| Total Awards | 0.0% | 0.0% | | 0.0% | | | | | | | 0.0% |
| No. of Awards | 0.1% | 0.1% | | 0.0% | | | | | | | 0.0% |
| CHARCOT-MARIE-TOOTH ASSOCIATION | | | | | | | | | | | |
| Total Awards | | | | | | | | | | 0.0% | 0.0% |
| No. of Awards | | | | | | | | | | 0.0% | 0.0% |
| CHEM-SPACE ASSOCIATES | | | | | | | | | | | |
| Total Awards | | | | | | | | 0.0% | | | 0.0% |
| No. of Awards | | | | | | | | 0.0% | | | 0.0% |
| CHERRYSTONE CORPORATION | | | | | | | | | | | |
| Total Awards | | | | | 0.0% | | | | | 0.0% | 0.0% |
| No. of Awards | | | | | 0.0% | | | | | 0.0% | 0.0% |
| CHESTER COUNTY AIDS SUPPORT SERVICES | | | | | | | | | | | |
| Total Awards | | | | | | | | | 0.0% | | 0.0% |
| No. of Awards | | | | | | | | | 0.0% | | 0.0% |
| CHI SYSTEMS, INC. | | | | | | | | | | | |
| Total Awards | | | | | | 0.0% | 0.1% | 0.1% | 0.1% | 0.1% | 0.0% |
| No. of Awards | | | | | | 0.0% | 0.1% | 0.1% | 0.1% | 0.1% | 0.0% |
| CHILDREN'S HOSPITAL OF PHILADELPHIA | | | | | | | | | | | |
| Total Awards | 3.2% | 3.1% | 2.9% | 3.1% | 3.7% | 4.3% | 4.3% | 4.3% | 4.2% | 4.6% | 3.9% |
| No. of Awards | 2.7% | 2.8% | 2.6% | 2.9% | 3.0% | 2.9% | 3.1% | 3.3% | 3.4% | 4.0% | 3.1% |
| CHILDREN'S HOSPITAL OF PITTSBURGH | | | | | | | | | | | |
| Total Awards | 0.9% | 1.0% | 0.8% | 1.4% | 1.4% | 1.5% | 1.2% | 1.2% | 1.1% | 0.7% | 1.1% |
| No. of Awards | 0.8% | 0.7% | 0.9% | 1.2% | 1.2% | 1.1% | 1.0% | 0.9% | 1.0% | 0.7% | 1.0% |
| CHILDREN'S SEASHORE HOUSE | | | | | | | | | | | |
| Total Awards | | | | | | | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| No. of Awards | | | | | | | 0.1% | 0.1% | 0.1% | 0.1% | 0.0% |
| CITIZENS GENERAL HOSPITAL | | | | | | | | | | | |
| Total Awards | 0.0% | | | | | | | | | | 0.0% |
| No. of Awards | 0.1% | | | | | | | | | | 0.0% |
| CLINICAL TOOLS, INC. | | | | | | | | | | | |
| Total Awards | | | | | | | 0.1% | 0.1% | 0.0% | 0.0% | 0.0% |
| No. of Awards | | | | | | | 0.0% | 0.0% | 0.1% | 0.1% | 0.0% |
| COACT TECHNOLOGIES | | | | | | | | | | | |
| Total Awards | 0.0% | | 0.1% | 0.0% | | | | | | | 0.0% |
| No. of Awards | 0.1% | | 0.0% | 0.0% | | | | | | | 0.0% |
| COGENICS, INC. | | | | | | | | | | | |
| Total Awards | | | | 0.0% | | | | | | | 0.0% |
| No. of Awards | | | | 0.0% | | | | | | | 0.0% |

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| COMMUNITY COLLEGE OF ALLEGHENY CNTY ALLE | | | | | | | | | | | |
| Total Awards | | | | | | | | 0.0% | | | 0.0% |
| No. of Awards | | | | | | | | 0.0% | | | 0.0% |
| COMMUNITY SERVICES INSTITUTE, INC. | | | | | | | | | | | |
| Total Awards | 0.1% | | | | | | | | | | 0.0% |
| No. of Awards | 0.1% | | | | | | | | | | 0.0% |
| COMPASS INFORMATION SERVICES, INC. | | | | | | | | | | | |
| Total Awards | | | | | | | 0.0% | 0.1% | | | 0.0% |
| No. of Awards | | | | | | | 0.0% | 0.0% | | | 0.0% |
| COMPUTATIONAL DIAGNOSTICS, INC. | | | | | | | | | | | |
| Total Awards | | | | | | | | | 0.0% | | 0.0% |
| No. of Awards | | | | | | | | | 0.0% | | 0.0% |
| COMPUTER HUMAN INTERFACE, INC. | | | | | | | | | | | |
| Total Awards | | 0.1% | 0.1% | | | | | | | | 0.0% |
| No. of Awards | | 0.1% | 0.0% | | | | | | | | 0.0% |
| CONREX PHARMACEUTICAL CORPORATION | | | | | | | | | | | |
| Total Awards | 0.0% | | | | | | | | | | 0.0% |
| No. of Awards | 0.1% | | | | | | | | | | 0.0% |
| CONSAD RESEARCH CORPORATION | | | | | | | | | | | |
| Total Awards | 0.0% | 0.1% | 0.1% | 0.1% | | | | | | | 0.0% |
| No. of Awards | 0.1% | 0.1% | 0.1% | 0.1% | | | | | | | 0.0% |
| CONSERVATION CENTER/ARTS & HIST ARTIFCTS | | | | | | | | | | | |
| Total Awards | | | 0.0% | 0.0% | 0.0% | | | | | | 0.0% |
| No. of Awards | | | 0.0% | 0.0% | 0.0% | | | | | | 0.0% |
| COSTELLO PHARMACEUTICAL | | | | | | | | | | | |
| Total Awards | | | | | | | | | 0.0% | | 0.0% |
| No. of Awards | | | | | | | | | 0.0% | | 0.0% |
| CROZER-KEYSTONE HEALTH SYSTEM | | | | | | | | | | | |
| Total Awards | | | | | | | | 0.0% | | | 0.0% |
| No. of Awards | | | | | | | | 0.0% | | | 0.0% |
| CYBERGENETICS COMPANY | | | | | | | | | | | |
| Total Awards | | | | | | | | | 0.0% | 0.1% | 0.0% |
| No. of Awards | | | | | | | | | 0.0% | 0.0% | 0.0% |
| DANIEL H. WAGNER ASSOCIATES | | | | | | | | | | | |
| Total Awards | | | | | 0.0% | 0.0% | 0.1% | | 0.1% | 0.1% | 0.0% |
| No. of Awards | | | | | 0.0% | 0.0% | 0.1% | | 0.0% | 0.1% | 0.0% |
| DATING VIOLENCE PREVENTION PROJECT, INC. | | | | | | | | | | | |
| Total Awards | | | | | | | | | 0.0% | 0.0% | 0.0% |
| No. of Awards | | | | | | | | | 0.0% | | 0.0% |

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| DELAWARE WATER GAP SCIENCE INSTITUTE | | | | | | | | | | | |
| Total Awards | | | | | | | | | 0.0% | 0.0% | 0.0% |
| No. of Awards | | | | | | | | | 0.0% | 0.0% | 0.0% |
| DELTAMETRICS | | | | | | | | | | | |
| Total Awards | | | | | | | | | | 0.0% | 0.0% |
| No. of Awards | | | | | | | | | | 0.0% | 0.0% |
| DEMEGEN, INC. | | | | | | | | | | | |
| Total Awards | | | | | | | | | 0.0% | 0.0% | 0.0% |
| No. of Awards | | | | | | | | | 0.0% | 0.0% | 0.0% |
| DENTALASERS | | | | | | | | | | | |
| Total Awards | | 0.0% | | | | | | | | | 0.0% |
| No. of Awards | | 0.1% | | | | | | | | | 0.0% |
| DIAGNOSTIC AND REHABILITATION CENTER | | | | | | | | | | | |
| Total Awards | 0.2% | | | | | | | | | | 0.0% |
| No. of Awards | 0.1% | | | | | | | | | | 0.0% |
| DICKINSON COLLEGE | | | | | | | | | | | |
| Total Awards | | | 0.0% | 0.0% | | | | | 0.0% | | 0.0% |
| No. of Awards | | | 0.0% | 0.0% | | | | | 0.0% | | 0.0% |
| DIGESTIVE CARE, INC. | | | | | | | | | | | |
| Total Awards | | | | | | 0.1% | 0.0% | | | | 0.0% |
| No. of Awards | | | | | | 0.0% | 0.1% | | | | 0.0% |
| DREXEL UNIVERSITY | | | | | | | | | | | |
| Total Awards | 0.3% | 0.4% | 0.4% | 0.4% | 0.1% | 0.3% | 0.3% | 0.2% | 0.2% | 0.3% | 0.3% |
| No. of Awards | 0.5% | 0.6% | 0.6% | 0.5% | 0.3% | 0.4% | 0.3% | 0.2% | 0.2% | 0.3% | 0.4% |
| DUBOIS REGIONAL MEDICAL CENTER | | | | | | | | | | | |
| Total Awards | | | 0.0% | | | | | | | | 0.0% |
| No. of Awards | | | 0.0% | | | | | | | | 0.0% |
| DUQUESNE LITHO, INC. | | | | | | | | | | | |
| Total Awards | | 0.0% | 0.0% | | | | | | | | 0.0% |
| No. of Awards | | 0.1% | 0.0% | | | | | | | | 0.0% |
| DUQUESNE UNIVERSITY | | | | | | | | | | | |
| Total Awards | 0.0% | 0.0% | 0.1% | 0.1% | 0.1% | 0.0% | 0.0% | 0.0% | 0.1% | 0.1% | 0.1% |
| No. of Awards | 0.1% | 0.1% | 0.3% | 0.1% | 0.2% | 0.1% | 0.0% | 0.0% | 0.1% | 0.3% | 0.1% |
| DYMAX CORPORATION | | | | | | | | | | | |
| Total Awards | | | | 0.0% | | | | | | | 0.0% |
| No. of Awards | | | | 0.0% | | | | | | | 0.0% |
| DYNAMIC DIGITAL DISPLAYS, INC. | | | | | | | | | | | |
| Total Awards | 0.1% | | 0.1% | | | | | | | | 0.0% |
| No. of Awards | 0.1% | | 0.0% | | | | | | | | 0.0% |

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| EDINBORO UNIVERSITY OF PENNSYLVANIA | | | | | | | | | | |
| Total Awards | 0.0% | 0.0% | 0.0% | | | | | | | 0.0% |
| No. of Awards | 0.1% | 0.1% | 0.0% | | | | | | | 0.0% |
| ELIZABETHTOWN COLLEGE | | | | | | | | | | |
| Total Awards | | | | | | | 0.0% | | | 0.0% |
| No. of Awards | | | | | | | 0.0% | | | 0.0% |
| EMERGENCY CARE RESEARCH INSTITUTE | | | | | | | | | | |
| Total Awards | | | 0.0% | 0.1% | 0.0% | 0.0% | 0.0% | 0.0% | | 0.0% |
| No. of Awards | | | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | | 0.0% |
| ENZYMATICS, INC. | | | | | | | | | | |
| Total Awards | 0.0% | 0.1% | | | 0.0% | | | | | 0.0% |
| No. of Awards | 0.1% | 0.1% | | | 0.1% | | | | | 0.0% |
| EPHRATA COMMUNITY HOSPITAL | | | | | | | | | | |
| Total Awards | | | | | | | | 0.0% | | 0.0% |
| No. of Awards | | | | | | | | 0.0% | | 0.0% |
| EXOCELL, INC. | | | | | | | | | | |
| Total Awards | | 0.0% | 0.1% | 0.1% | 0.0% | 0.0% | | 0.1% | 0.1% | 0.0% |
| No. of Awards | | 0.1% | 0.1% | 0.1% | 0.0% | 0.0% | | 0.1% | 0.1% | 0.1% |
| EXTREL CORPORATION | | | | | | | | | | |
| Total Awards | 0.0% | | 0.0% | | | | | | | 0.0% |
| No. of Awards | 0.1% | | 0.1% | | | | | | | 0.0% |
| EXZYME, INC. | | | | | | | | | | |
| Total Awards | | | | | | | 0.0% | 0.0% | | 0.0% |
| No. of Awards | | | | | | | 0.0% | 0.0% | | 0.0% |
| EYE AND EAR HOSPITAL OF PITTSBURGH | | | | | | | | | | |
| Total Awards | 0.4% | 0.0% | | | | | | | | 0.0% |
| No. of Awards | 0.6% | 0.2% | | | | | | | | 0.1% |
| EYE AND EAR INSTITUTE OF PITTSBURGH | | | | | | | | | | |
| Total Awards | 0.2% | 0.6% | 0.8% | 0.9% | 0.9% | | | | | 0.3% |
| No. of Awards | 0.3% | 0.9% | 1.1% | 1.2% | 1.2% | | | | | 0.4% |
| FAMILY HEALTH COUNCIL OF CENT PA | | | | | | | | | | |
| Total Awards | 0.0% | | | | | | | | | 0.0% |
| No. of Awards | 0.1% | | | | | | | | | 0.0% |
| FERTILITY TESTING LABORATORY | | | | | | | | | | |
| Total Awards | 0.0% | | | | | | | | | 0.0% |
| No. of Awards | 0.1% | | | | | | | | | 0.0% |
| FIELD DIAGNOSTIC SERVICES, INC. | | | | | | | | | | |
| Total Awards | | | | | | | | 0.1% | 0.1% | 0.0% |
| No. of Awards | | | | | | | | 0.0% | 0.1% | 0.0% |

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| FORSYTH ELECTRO-OPTICS | | | | | | | | | | | |
| Total Awards | | | | | | 0.0% | | | | | 0.0% |
| No. of Awards | | | | | | 0.0% | | | | | 0.0% |
| FOX CHASE CANCER CENTER | | | | | | | | | | | |
| Total Awards | 2.3% | 4.0% | 3.7% | 3.5% | 3.6% | 4.2% | 4.0% | 3.8% | 3.6% | 3.3% | 3.6% |
| No. of Awards | 1.8% | 1.9% | 2.0% | 2.4% | 2.7% | 2.7% | 3.0% | 2.6% | 2.4% | 2.0% | 2.3% |
| FOX FARSIGHT PRODUCTIONS, INC. | | | | | | | | | | | |
| Total Awards | | | | | | | | | | 0.0% | 0.0% |
| No. of Awards | | | | | | | | | | 0.0% | 0.0% |
| FRANKLIN AND MARSHALL COLLEGE | | | | | | | | | | | |
| Total Awards | 0.1% | | | | | | 0.0% | 0.0% | | | 0.0% |
| No. of Awards | 0.1% | | | | | | 0.0% | 0.0% | | | 0.0% |
| GEISINGER FOUNDATION | | | | | | | | | | | |
| Total Awards | 0.0% | 0.0% | 0.0% | 0.0% | | 0.0% | 0.0% | 0.0% | 0.1% | | 0.0% |
| No. of Awards | 0.1% | 0.1% | 0.1% | 0.1% | | 0.0% | 0.0% | 0.0% | 0.0% | | 0.0% |
| GEISINGER MEDICAL CENTER | | | | | | | | | | | |
| Total Awards | 0.2% | 0.2% | 0.1% | 0.1% | | | | | | 0.0% | 0.1% |
| No. of Awards | 0.3% | 0.3% | 0.2% | 0.2% | | | | | | 0.0% | 0.1% |
| GENE TRANSCRIPTION TECH, INC. | | | | | | | | | | | |
| Total Awards | | | | | | | | | | 0.0% | 0.0% |
| No. of Awards | | | | | | | | | | 0.0% | 0.0% |
| GENERAL GRAPHIC SERVICES | | | | | | | | | | | |
| Total Awards | | | | | | | | 0.0% | | | 0.0% |
| No. of Awards | | | | | | | | 0.1% | | | 0.0% |
| GETTYSBURG COLLEGE | | | | | | | | | | | |
| Total Awards | | 0.0% | | 0.0% | | | | | | | 0.0% |
| No. of Awards | | 0.1% | | 0.0% | | | | | | | 0.0% |
| GRADUATE HOSPITAL (PHILADELPHIA) | | | | | | | | | | | |
| Total Awards | 0.3% | 0.3% | 0.3% | 0.4% | 0.3% | 0.3% | 0.3% | 0.2% | 0.1% | 0.0% | 0.3% |
| No. of Awards | 0.5% | 0.6% | 0.6% | 0.6% | 0.6% | 0.4% | 0.5% | 0.3% | 0.2% | 0.0% | 0.4% |
| GUTHRIE FOUNDATION FOR EDUCATION AND RES | | | | | | | | | | | |
| Total Awards | 0.0% | 0.0% | 0.0% | | 0.0% | 0.0% | 0.0% | 0.0% | 0.1% | 0.1% | 0.0% |
| No. of Awards | 0.1% | 0.1% | 0.0% | | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% |
| HAHNEMANN UNIVERSITY | | | | | | | | | | | |
| Total Awards | 2.2% | 1.5% | 2.0% | 1.8% | 1.7% | 1.5% | | | | | 0.9% |
| No. of Awards | 2.4% | 2.0% | 2.0% | 1.8% | 2.0% | 1.8% | | | | | 1.1% |
| HAVERFORD COLLEGE | | | | | | | | | | | |
| Total Awards | | 0.0% | | | | 0.0% | | | | | 0.0% |
| No. of Awards | | 0.1% | | | | 0.0% | | | | | 0.0% |

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| HAZLETON RESEARCH PRODUCTS, INC. | | | | | | | | | | | |
| Total Awards | 0.1% | 0.1% | 0.0% | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% | | 0.1% |
| No. of Awards | 0.1% | 0.1% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | | | 0.0% |
| HD TECHNOLOGIES, INC. | | | | | | | | | | | |
| Total Awards | | | | | | | 0.0% | | | | 0.0% |
| No. of Awards | | | | | | | 0.0% | | | | 0.0% |
| HEALTH FEDERATION OF PHILADELPHIA | | | | | | | | | | | |
| Total Awards | | | | | | | 0.0% | | | | 0.0% |
| No. of Awards | | | | | | | 0.0% | | | | 0.0% |
| HERCON LABORATORIES CORPORATION | | | | | | | | | | | |
| Total Awards | 0.0% | | | | | | | | | | 0.0% |
| No. of Awards | 0.1% | | | | | | | | | | 0.0% |
| HORIZON HOUSE | | | | | | | | | | | |
| Total Awards | 0.1% | 0.0% | | | | | | | | | 0.0% |
| No. of Awards | 0.1% | | | | | | | | | | 0.0% |
| IMMACULATA COLLEGE | | | | | | | | | | | |
| Total Awards | | | | | | | | | | 0.0% | 0.0% |
| No. of Awards | | | | | | | | | | 0.0% | 0.0% |
| IMMUNA CARE CORPORATION | | | | | | | | | | | |
| Total Awards | | | 0.0% | | 0.1% | | | | | | 0.0% |
| No. of Awards | | | 0.0% | | 0.0% | | | | | | 0.0% |
| IMMUNICON CORPORATION | | | | | | | | | | | |
| Total Awards | | | 0.0% | 0.0% | 0.0% | | | | | | 0.0% |
| No. of Awards | | | 0.1% | 0.0% | 0.0% | | | | | | 0.0% |
| INDIANA UNIVERSITY OF PENNSYLVANIA | | | | | | | | | | | |
| Total Awards | | 0.0% | | 0.0% | | | | | | | 0.0% |
| No. of Awards | | 0.1% | | 0.0% | | | | | | | 0.0% |
| INDIVIDUAL AWARD--SPEAKER, SUSAN | | | | | | | | | | | |
| Total Awards | | | | | | | | | | 0.0% | 0.0% |
| No. of Awards | | | | | | | | | | 0.0% | 0.0% |
| INDUSTRIAL BIOCATALYSIS, INC. | | | | | | | | | | | |
| Total Awards | | | | | | | | 0.0% | | | 0.0% |
| No. of Awards | | | | | | | | 0.1% | | | 0.0% |
| INFORMATION SYSTEMS TECHNOLOGY CORP | | | | | | | | | | | |
| Total Awards | 0.0% | 0.0% | | | | | | | | | 0.0% |
| No. of Awards | 0.1% | 0.1% | | | | | | | | | 0.0% |
| INFORMATION VENTURES, INC. | | | | | | | | | | | |
| Total Awards | 0.4% | 0.4% | 0.3% | 0.2% | 0.2% | 0.2% | 0.2% | 0.2% | 0.2% | 0.1% | 0.2% |
| No. of Awards | 0.3% | 0.2% | 0.2% | 0.2% | 0.2% | 0.1% | 0.1% | 0.2% | 0.1% | 0.1% | 0.2% |

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| INSTITUTE FOR CANCER RESEARCH | | | | | | | | | | | |
| Total Awards | 4.0% | 2.1% | 2.0% | 2.0% | 1.9% | 1.5% | 1.3% | 1.2% | 1.4% | 1.2% | 1.7% |
| No. of Awards | 1.9% | 1.8% | 1.6% | 1.6% | 1.5% | 1.4% | 1.2% | 1.1% | 1.6% | 1.2% | 1.5% |
| INSTITUTE FOR COGNITIVE PROSTHETICS | | | | | | | | | | | |
| Total Awards | | | | 0.0% | 0.1% | 0.0% | | | | 0.0% | 0.0% |
| No. of Awards | | | | 0.0% | 0.0% | 0.0% | | | | 0.0% | 0.0% |
| INSTITUTE FOR SCIENTIFIC INFORMATION | | | | | | | | | | | |
| Total Awards | | | | | | | 0.0% | | | 0.0% | 0.0% |
| No. of Awards | | | | | | | 0.0% | | | 0.0% | 0.0% |
| INTEGRA, INC. | | | | | | | | | | | |
| Total Awards | 0.0% | 0.0% | 0.1% | 0.0% | 0.1% | 0.0% | 0.1% | | | | 0.0% |
| No. of Awards | 0.1% | 0.1% | 0.1% | 0.0% | 0.1% | 0.0% | 0.0% | | | | 0.0% |
| INTERSCIENCES DEVELOPMENT ASSOCIATES | | | | | | | | | | | |
| Total Awards | | | 0.1% | 0.1% | | | | | | | 0.0% |
| No. of Awards | | | 0.0% | 0.0% | | | | | | | 0.0% |
| INTERSPEC, INC. | | | | | | | | | | | |
| Total Awards | 0.1% | | | | | | | | | | 0.0% |
| No. of Awards | 0.1% | | | | | | | | | | 0.0% |
| J. C. BLAIR MEMORIAL HOSPITAL | | | | | | | | | | | |
| Total Awards | | | 0.0% | | | | | | | | 0.0% |
| No. of Awards | | | 0.0% | | | | | | | | 0.0% |
| JMS VISION LOSS REHABILITATION | | | | | | | | | | | |
| Total Awards | 0.0% | 0.0% | | | | | | | | | 0.0% |
| No. of Awards | 0.1% | 0.1% | | | | | | | | | 0.0% |
| JOSEPH V. LAMBERT ASSOCIATES | | | | | | | | | | | |
| Total Awards | 0.0% | | | | | | | | | | 0.0% |
| No. of Awards | 0.1% | | | | | | | | | | 0.0% |
| JUNIATA COLLEGE | | | | | | | | | | | |
| Total Awards | | | | | | | | 0.0% | 0.0% | 0.0% | 0.0% |
| No. of Awards | | | | | | | | 0.0% | 0.0% | 0.0% | 0.0% |
| KDL MEDICAL TECHNOLOGIES, INC. | | | | | | | | | | | |
| Total Awards | | | | | 0.0% | | | 0.1% | 0.1% | 0.0% | 0.0% |
| No. of Awards | | | | | 0.0% | | | 0.0% | 0.0% | 0.0% | 0.0% |
| KESSLER COMMUNICATIONS, INC. | | | | | | | | | | | |
| Total Awards | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | | | | | | 0.0% |
| No. of Awards | 0.1% | 0.1% | 0.1% | 0.0% | 0.0% | | | | | | 0.0% |
| KEYSTONE SCIENTIFIC, INC. | | | | | | | | | | | |
| Total Awards | | | | | | | | 0.0% | | | 0.0% |
| No. of Awards | | | | | | | | 0.0% | | | 0.0% |

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|---|---|---|---|---|---|---|---|---|---|---|---|
| LAKE ERIE COLLEGE/OSTEOPATHIC MEDICINE | | | | | | | | | | | |
| Total Awards | | | | | | | 0.0% | | | | 0.0% |
| No. of Awards | | | | | | | 0.0% | | | | 0.0% |
| LANCASTER CLEFT PALATE CLINIC | | | | | | | | | | | |
| Total Awards | | | | | | 0.0% | 0.1% | 0.0% | | | 0.0% |
| No. of Awards | | | | | | 0.0% | 0.0% | 0.0% | | | 0.0% |
| LANKENAU HOSPITAL | | | | | | | | | | | |
| Total Awards | 0.0% | 0.0% | 0.0% | | | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% | 0.0% |
| No. of Awards | 0.1% | 0.1% | 0.0% | | | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% |
| LANKENAU MEDICAL RESEARCH CENTER | | | | | | | | | | | |
| Total Awards | 0.0% | 0.2% | 0.3% | 0.3% | 0.3% | 0.2% | 0.2% | 0.3% | 0.3% | 0.3% | 0.2% |
| No. of Awards | 0.2% | 0.3% | 0.4% | 0.4% | 0.4% | 0.3% | 0.3% | 0.4% | 0.3% | 0.3% | 0.3% |
| LAUREL HIGHLANDS HEALTH SCIENCES LIBRARY | | | | | | | | | | | |
| Total Awards | | | | | | 0.0% | | | | | 0.0% |
| No. of Awards | | | | | | 0.0% | | | | | 0.0% |
| LEHIGH UNIVERSITY | | | | | | | | | | | |
| Total Awards | 0.2% | 0.2% | 0.2% | 0.2% | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% |
| No. of Awards | 0.5% | 0.5% | 0.4% | 0.4% | 0.4% | 0.3% | 0.3% | 0.2% | 0.2% | 0.3% | 0.3% |
| LIFESPAN TECHNOLOGY | | | | | | | | | | | |
| Total Awards | | | | | 0.0% | 0.0% | | | | | 0.0% |
| No. of Awards | | | | | 0.0% | 0.0% | | | | | 0.0% |
| LINCOLN UNIVERSITY | | | | | | | | | | | |
| Total Awards | 0.1% | 0.1% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| No. of Awards | 0.1% | 0.1% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.1% | 0.1% |
| MAGAININ PHARMACEUTICALS, INC. | | | | | | | | | | | |
| Total Awards | 0.0% | 0.0% | 0.1% | 0.0% | | | | | | | 0.0% |
| No. of Awards | 0.1% | 0.1% | 0.0% | 0.0% | | | | | | | 0.0% |
| MAGEE-WOMEN'S HOSPITAL | | | | | | | | | | | |
| Total Awards | 0.3% | 0.2% | 0.2% | 0.2% | 0.3% | 0.4% | 0.7% | 0.7% | 1.0% | 1.1% | 0.6% |
| No. of Awards | 0.6% | 0.7% | 0.5% | 0.4% | 0.5% | 0.6% | 0.7% | 0.8% | 1.0% | 1.1% | 0.7% |
| MATREYA, INC. | | | | | | | | | | | |
| Total Awards | | | | 0.0% | | | | | | | 0.0% |
| No. of Awards | | | | 0.0% | | | | | | | 0.0% |
| MEDICAL SYSTEMS ASSOCIATES, INC. | | | | | | | | | | | |
| Total Awards | | | | | | | | 0.0% | 0.0% | | 0.0% |
| No. of Awards | | | | | | | | 0.1% | 0.0% | | 0.0% |
| MEDIMATRIX, INC. | | | | | | | | | | | |
| Total Awards | 0.1% | 0.1% | | | 0.0% | 0.0% | | | | | 0.0% |
| No. of Awards | 0.1% | 0.1% | | | 0.0% | 0.0% | | | | | 0.0% |

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| MELLON PITTS CORPORATION (MPC) | | | | | | | | | | | |
| Total Awards | 0.4% | 0.4% | 0.5% | 0.4% | 0.4% | 0.4% | 0.4% | 0.2% | 0.3% | 0.4% | 0.4% |
| No. of Awards | 0.1% | 0.1% | 0.2% | 0.2% | 0.2% | 0.2% | 0.1% | 0.2% | 0.1% | 0.2% | 0.2% |
| MERCY CATHOLIC MEDICAL CENTER | | | | | | | | | | | |
| Total Awards | 0.7% | 0.0% | | 0.0% | 0.1% | 0.0% | | | | | 0.1% |
| No. of Awards | 0.1% | 0.1% | | 0.0% | 0.0% | 0.0% | | | | | 0.0% |
| MERCY HOSPITAL (SCRANTON, PA) | | | | | | | | | | | |
| Total Awards | 0.0% | | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | | | 0.0% |
| No. of Awards | 0.1% | | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | | | | 0.0% |
| MERCY HOSPITAL OF PITTSBURGH | | | | | | | | | | | |
| Total Awards | | | | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.1% | 0.0% |
| No. of Awards | | | | 0.0% | 0.0% | 0.0% | 0.1% | 0.0% | 0.1% | 0.1% | 0.0% |
| MESSAGE PHARMACEUTICALS, INC. | | | | | | | | | | | |
| Total Awards | | | | | | | | | | 0.0% | 0.0% |
| No. of Awards | | | | | | | | | | 0.0% | 0.0% |
| METAMORPHIC SURGICAL DEVICES | | | | | | | | | | | |
| Total Awards | | | | | | | | 0.0% | | 0.1% | 0.0% |
| No. of Awards | | | | | | | | 0.0% | | 0.0% | 0.0% |
| MICROSIGNAL CORPORATION | | | | | | | | | | | |
| Total Awards | | | | | | 0.0% | | | | | 0.0% |
| No. of Awards | | | | | | 0.0% | | | | | 0.0% |
| MOBERG MEDICAL, INC. | | | | | | | | | | | |
| Total Awards | | | | | 0.0% | 0.0% | 0.0% | 0.1% | 0.0% | | 0.0% |
| No. of Awards | | | | | 0.0% | 0.0% | 0.0% | 0.1% | 0.0% | | 0.0% |
| MOBERG RESEARCH, INC. | | | | | | | | | | | |
| Total Awards | | | | | | | | | | 0.0% | 0.0% |
| No. of Awards | | | | | | | | | | 0.1% | 0.0% |
| MOLECULAR TARGETING TECHNOLOGY, INC. | | | | | | | | | | | |
| Total Awards | | | | | | | 0.0% | | | 0.0% | 0.0% |
| No. of Awards | | | | | | | 0.0% | | | 0.0% | 0.0% |
| MONELL CHEMICAL SENSES CENTER | | | | | | | | | | | |
| Total Awards | 0.7% | 0.8% | 0.7% | 0.6% | 0.8% | 0.7% | 0.6% | 0.6% | 0.5% | 0.5% | 0.6% |
| No. of Awards | 1.1% | 1.2% | 1.1% | 1.1% | 1.2% | 1.0% | 0.9% | 0.9% | 0.8% | 0.8% | 1.0% |
| MONITEC, INC. | | | | | | | | | | | |
| Total Awards | | | | | | | | 0.0% | | | 0.0% |
| No. of Awards | | | | | | | | 0.0% | | | 0.0% |
| MONTEFIORE UNIVERSITY HOSPITAL | | | | | | | | | | | |
| Total Awards | 0.3% | 0.2% | 0.3% | 0.0% | 0.0% | 0.0% | | | | | 0.1% |
| No. of Awards | 0.4% | 0.4% | 0.6% | 0.2% | 0.0% | 0.0% | | | | | 0.1% |

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| MOSS REHABILITATION HOSPITAL | | | | | | | | | | | |
| Total Awards | 0.0% | 0.0% | 0.0% | 0.1% | 0.2% | 0.2% | 0.2% | 0.2% | 0.1% | 0.1% | 0.1% |
| No. of Awards | 0.1% | 0.1% | 0.1% | 0.1% | 0.2% | 0.2% | 0.2% | 0.1% | 0.1% | 0.2% | 0.1% |
| NATIONAL DISEASE RESEARCH INTERCHANGE | | | | | | | | | | | |
| Total Awards | 0.3% | 0.4% | 0.4% | 0.3% | 0.3% | 0.3% | 0.3% | 0.2% | 0.1% | 0.1% | 0.2% |
| No. of Awards | 0.1% | 0.2% | 0.1% | 0.1% | 0.1% | 0.0% | 0.1% | 0.1% | 0.0% | | 0.1% |
| NATIONAL UNDERGROUND STORAGE | | | | | | | | | | | |
| Total Awards | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| No. of Awards | 0.1% | 0.1% | 0.0% | 0.0% | 0.0% | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% |
| NEO GEN SCREENING, INC. | | | | | | | | | | | |
| Total Awards | | | | | | | | 0.0% | 0.0% | 0.0% | 0.0% |
| No. of Awards | | | | | | | | 0.0% | 0.0% | 0.0% | 0.0% |
| NIM, INC. | | | | | | | | | | | |
| Total Awards | 0.1% | 0.1% | 0.1% | 0.1% | | 0.0% | 0.2% | 0.1% | 0.1% | 0.1% | 0.1% |
| No. of Awards | 0.1% | 0.2% | 0.0% | 0.1% | | 0.1% | 0.1% | 0.1% | 0.0% | 0.0% | 0.1% |
| ONCOLOGY NURSING SOCIETY | | | | | | | | | | | |
| Total Awards | 0.1% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | | | 0.0% | 0.0% | 0.0% |
| No. of Awards | 0.1% | 0.1% | 0.0% | 0.1% | 0.1% | 0.1% | | | 0.1% | 0.1% | 0.1% |
| OPTICAL DEVICES, INC. | | | | | | | | | | | |
| Total Awards | | | | | | | | | | 0.0% | 0.0% |
| No. of Awards | | | | | | | | | | 0.0% | 0.0% |
| ORNITHINE DECARBOXYLASE(ODC)MOUSE GROUP | | | | | | | | | | | |
| Total Awards | | | | | | | | | | 0.0% | 0.0% |
| No. of Awards | | | | | | | | | | 0.0% | 0.0% |
| OTSUKA ELECTRONICS, USA | | | | | | | | | | | |
| Total Awards | 0.1% | | | | | | | | | | 0.0% |
| No. of Awards | 0.1% | | | | | | | | | | 0.0% |
| PENNSYLVANIA COLLEGE OF OPTOMETRY | | | | | | | | | | | |
| Total Awards | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% | 0.0% | 0.0% | 0.1% | 0.1% |
| No. of Awards | 0.2% | 0.3% | 0.3% | 0.2% | 0.2% | 0.2% | 0.1% | 0.0% | 0.1% | 0.1% | 0.2% |
| PENNSYLVANIA COLLEGE OF PODIATRIC MED | | | | | | | | | | | |
| Total Awards | | | | 0.0% | | | | 0.0% | | | 0.0% |
| No. of Awards | | | | 0.0% | | | | 0.0% | | | 0.0% |
| PENNSYLVANIA HOSPITAL (PHILADELPHIA) | | | | | | | | | | | |
| Total Awards | 0.3% | 0.2% | 0.2% | 0.1% | 0.1% | | | | | | 0.1% |
| No. of Awards | 0.3% | 0.2% | 0.1% | 0.0% | 0.0% | | | | | | 0.1% |
| PENNSYLVANIA OFFICE OF MENTAL HEALTH | | | | | | | | | | | |
| Total Awards | | 0.1% | 0.1% | 0.1% | | | | | | | 0.0% |
| No. of Awards | | 0.1% | 0.0% | 0.1% | | | | | | | 0.0% |

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| PENNSYLVANIA STATE DEPT OF HEALTH | | | | | | | | | | | |
| Total Awards | 0.1% | 0.1% | 0.1% | 0.1% | 0.0% | 0.0% | 0.0% | | | | 0.0% |
| No. of Awards | 0.1% | 0.1% | 0.1% | 0.1% | 0.0% | 0.0% | 0.0% | | | | 0.0% |
| PENNSYLVANIA STATE DEPT OF PUBL WELFARE | | | | | | | | | | | |
| Total Awards | 0.1% | 0.1% | 0.1% | 0.0% | | | 0.0% | | | | 0.0% |
| No. of Awards | 0.1% | 0.1% | 0.1% | | | | 0.0% | | | | 0.0% |
| PENNSYLVANIA STATE UNIV HERSHEY MED CTR | | | | | | | | | | | |
| Total Awards | 4.1% | 4.5% | 4.2% | 4.6% | 4.5% | 4.3% | 4.3% | 4.9% | 4.0% | 4.1% | 4.4% |
| No. of Awards | 4.7% | 4.7% | 4.8% | 5.0% | 5.0% | 4.5% | 4.6% | 4.8% | 5.0% | 4.8% | 4.8% |
| PENNSYLVANIA STATE UNIVERSITY-UNIV PARK | | | | | | | | | | | |
| Total Awards | 3.1% | 3.5% | 3.5% | 3.7% | 3.5% | 4.0% | 3.9% | 4.2% | 4.3% | 4.0% | 3.8% |
| No. of Awards | 5.1% | 5.1% | 5.1% | 5.3% | 4.8% | 5.5% | 5.4% | 5.3% | 5.4% | 5.2% | 5.2% |
| PHILADELPHIA BIOMEDICAL RESEARCH INST | | | | | | | | | | | |
| Total Awards | | 0.0% | | 0.0% | 0.0% | 0.0% | | | | | 0.0% |
| No. of Awards | | 0.1% | | 0.0% | 0.0% | 0.0% | | | | | 0.0% |
| PHILADELPHIA CHILD GUIDANCE CLINIC | | | | | | | | | | | |
| Total Awards | | | | | | 0.0% | 0.0% | | 0.0% | 0.0% | 0.0% |
| No. of Awards | | | | | | 0.0% | 0.0% | | 0.0% | 0.0% | 0.0% |
| PHILADELPHIA COLLEGE OF OSTEOPATHIC MED | | | | | | | | | | | |
| Total Awards | | 0.0% | 0.0% | 0.0% | | | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| No. of Awards | | 0.1% | 0.1% | 0.0% | | | 0.1% | 0.1% | 0.0% | 0.1% | 0.1% |
| PHILADELPHIA FIGHT | | | | | | | | | | | |
| Total Awards | | | | | | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% |
| No. of Awards | | | | | | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| PHILADELPHIA GERIATRIC CTR-FRIEDMAN HOSP | | | | | | | | | | | |
| Total Awards | 0.9% | 0.5% | 0.6% | 0.6% | 0.4% | 0.4% | 0.4% | 0.3% | 0.1% | 0.1% | 0.4% |
| No. of Awards | 0.4% | 0.4% | 0.5% | 0.6% | 0.6% | 0.5% | 0.4% | 0.4% | 0.2% | 0.1% | 0.4% |
| PHILADELPHIA HEALTH MANAGEMENT CORP | | | | | | | | | | | |
| Total Awards | 0.3% | 0.2% | 0.3% | 0.2% | 0.2% | 0.2% | | | | | 0.1% |
| No. of Awards | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% | | | | | 0.0% |
| POLYPROBE, INC. | | | | | | | | | | | |
| Total Awards | | | | | 0.0% | | | 0.0% | 0.0% | | 0.0% |
| No. of Awards | | | | | 0.0% | | | 0.0% | 0.0% | | 0.0% |
| POLYSCIENCES, INC. | | | | | | | | | | | |
| Total Awards | 0.1% | 0.0% | | 0.0% | | | | | | | 0.0% |
| No. of Awards | 0.1% | 0.1% | | 0.0% | | | | | | | 0.0% |
| PRESBYTERIAN MEDICAL CENTER OF PHILA | | | | | | | | | | | |
| Total Awards | 0.4% | 0.2% | 0.2% | 0.2% | 0.2% | 0.1% | 0.2% | 0.0% | | | 0.1% |
| No. of Awards | 0.6% | 0.4% | 0.3% | 0.2% | 0.2% | 0.3% | 0.3% | 0.1% | | | 0.2% |

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|---|---|---|---|---|---|---|---|---|---|---|
| PRESERVATION RESOURCES | | | | | | | | | | |
| Total Awards | | 0.0% | | | | 0.1% | 0.1% | 0.1% | 0.1% | 0.0% |
| No. of Awards | | 0.1% | | | | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| PREVENTIVE MEDICAL TECHNOLOGIES, INC. | | | | | | | | | | |
| Total Awards | | | | | | | | | 0.0% | 0.0% |
| No. of Awards | | | | | | | | | 0.0% | 0.0% |
| PROLX PHARMACEUTICALS, INC. | | | | | | | | | | |
| Total Awards | | | | | | | | 0.0% | 0.0% | 0.0% |
| No. of Awards | | | | | | | | 0.0% | 0.0% | 0.0% |
| PROVAC, INC. | | | | | | | | | | |
| Total Awards | | 0.0% | | | | | | | | 0.0% |
| No. of Awards | | 0.1% | | | | | | | | 0.0% |
| PSYCHOLOGY SOFTWARE TOOLS, INC. | | | | | | | | | | |
| Total Awards | | | | | 0.0% | | | 0.0% | 0.1% | 0.0% |
| No. of Awards | | | | | 0.0% | | | 0.0% | 0.1% | 0.0% |
| PUBLIC/PRIVATE VENTURES | | | | | | | | | | |
| Total Awards | | | | 0.0% | | | | | | 0.0% |
| No. of Awards | | | | 0.0% | | | | | | 0.0% |
| PURESYN, INC. | | | | | | | | | | |
| Total Awards | | | | | | | | 0.0% | | 0.0% |
| No. of Awards | | | | | | | | 0.0% | | 0.0% |
| Q-CHEM, INC. | | | | | | | | | | |
| Total Awards | | | | | | | | | 0.0% | 0.0% |
| No. of Awards | | | | | | | | | 0.0% | 0.0% |
| QDOT CORPORATION | | | | | | | | | | |
| Total Awards | | | | | | | | 0.0% | | 0.0% |
| No. of Awards | | | | | | | | 0.0% | | 0.0% |
| QED COMMUNICATIONS, INC. | | | | | | | | | | |
| Total Awards | | | 0.0% | 0.0% | | | | | | 0.0% |
| No. of Awards | | | 0.0% | 0.0% | | | | | | 0.0% |
| QED IMAGING, INC. | | | | | | | | | | |
| Total Awards | | | | | | | | | 0.0% | 0.0% |
| No. of Awards | | | | | | | | | 0.0% | 0.0% |
| RJ LEE GROUP | | | | | | | | | | |
| Total Awards | 0.1% | 0.0% | | | | | | | | 0.0% |
| No. of Awards | 0.1% | 0.1% | | | | | | | | 0.0% |
| ROBERT PACKER HOSPITAL | | | | | | | | | | |
| Total Awards | | | 0.0% | 0.0% | | | | | | 0.0% |
| No. of Awards | | | 0.0% | 0.0% | | | | | | 0.0% |

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| SACRED HEART HOSPITAL | | | | | | | | | | | |
| Total Awards | | | 0.0% | | | | | | | | 0.0% |
| No. of Awards | | | 0.0% | | | | | | | | 0.0% |
| SEER SYSTEMS, INC. | | | | | | | | | | | |
| Total Awards | | | | | | | 0.0% | | | | 0.0% |
| No. of Awards | | | | | | | 0.0% | | | | 0.0% |
| SERVICEWARE, INC. | | | | | | | | | | | |
| Total Awards | | | | | | | 0.0% | | | | 0.0% |
| No. of Awards | | | | | | | 0.0% | | | | 0.0% |
| SHIPPENSBURG UNIVERSITY OF PENNSYLVANIA | | | | | | | | | | | |
| Total Awards | | | | 0.0% | | | | | | 0.0% | 0.0% |
| No. of Awards | | | | 0.0% | | | | | | 0.0% | 0.0% |
| SMITHKLINE BEECHAM PHARMACEUTICALS | | | | | | | | | | | |
| Total Awards | | | 0.0% | 0.0% | | 0.0% | 0.0% | 0.0% | 0.0% | | 0.0% |
| No. of Awards | | | 0.0% | 0.0% | | 0.0% | 0.0% | 0.1% | 0.1% | | 0.0% |
| SMITHKLINE BEECHAM, PLC | | | | | | | | | | | |
| Total Awards | 0.1% | | 0.2% | | | | | | | | 0.0% |
| No. of Awards | 0.1% | | 0.1% | | | | | | | | 0.0% |
| SONIC TECHNOLOGIES | | | | | | | | | | | |
| Total Awards | | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | | | 0.0% |
| No. of Awards | | 0.1% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | | | 0.0% |
| SPARTA PHARMACEUTICAL CORPORATION | | | | | | | | | | | |
| Total Awards | | | | | | 0.0% | 0.0% | 0.0% | 0.1% | 0.1% | 0.0% |
| No. of Awards | | | | | | 0.0% | 0.1% | 0.0% | 0.0% | 0.1% | 0.0% |
| SPECTRASONICS IMAGING | | | | | | | | | | | |
| Total Awards | | | | | | | 0.0% | | 0.1% | 0.1% | 0.0% |
| No. of Awards | | | | | | | 0.0% | | 0.0% | 0.1% | 0.0% |
| ST. JOSEPH'S UNIVERSITY | | | | | | | | | | | |
| Total Awards | 0.0% | | | 0.0% | | | 0.0% | | | | 0.0% |
| No. of Awards | 0.1% | | | 0.0% | | | 0.1% | | | | 0.0% |
| ST. PETER'S CHILD DEVELOPMENT CENTERS | | | | | | | | | | | |
| Total Awards | | | | | | 0.0% | | | | | 0.0% |
| No. of Awards | | | | | | 0.0% | | | | | 0.0% |
| STC TECHNOLOGIES, INC. | | | | | | | | | | | |
| Total Awards | | | | | | | | 0.0% | | | 0.0% |
| No. of Awards | | | | | | | | 0.0% | | | 0.0% |
| STEMCELL THERAPEUTICS, LLC | | | | | | | | | | | |
| Total Awards | | | | | | | | 0.0% | | | 0.0% |
| No. of Awards | | | | | | | | 0.0% | | | 0.0% |

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| STONY BROOK SCIENTIFIC, LTD. | | | | | | | | | | | |
| Total Awards | | | | 0.0% | | | | | | | 0.0% |
| No. of Awards | | | | 0.0% | | | | | | | 0.0% |
| SUSQUEHANNA HEALTH SYSTEM | | | | | | | | | | | |
| Total Awards | | | | | | | | 0.0% | | | 0.0% |
| No. of Awards | | | | | | | | 0.0% | | | 0.0% |
| SUSQUEHANNA UNIVERSITY | | | | | | | | | | | |
| Total Awards | | | | | 0.0% | | | 0.0% | 0.0% | 0.0% | 0.0% |
| No. of Awards | | | | | 0.0% | | | 0.0% | 0.1% | 0.0% | 0.0% |
| SWARTHMORE COLLEGE | | | | | | | | | | | |
| Total Awards | | | 0.0% | | | | | 0.0% | | 0.0% | 0.0% |
| No. of Awards | | | 0.1% | | | | | 0.0% | | 0.0% | 0.0% |
| SWETS SUBSCRIPTION SERVICE | | | | | | | | | | | |
| Total Awards | | | | | | | | | 0.0% | 0.2% | 0.0% |
| No. of Awards | | | | | | | | | 0.0% | 0.0% | 0.0% |
| SYMPOSIA, INC. | | | | | | | | | | | |
| Total Awards | | | 0.0% | | | | | | | | 0.0% |
| No. of Awards | | | 0.0% | | | | | | | | 0.0% |
| SYNCHROTRONICS, INC. | | | | | | | | | | | |
| Total Awards | | 0.0% | 0.0% | | | | | | | | 0.0% |
| No. of Awards | | 0.1% | 0.0% | | | | | | | | 0.0% |
| TELEFACTOR CORPORATION | | | | | | | | | | | |
| Total Awards | 0.0% | | | 0.0% | 0.0% | 0.1% | 0.1% | 0.1% | 0.1% | 0.0% | 0.0% |
| No. of Awards | 0.1% | | | 0.0% | 0.0% | 0.1% | 0.1% | 0.1% | 0.1% | 0.0% | 0.1% |
| TELEGRAPHIQUES | | | | | | | | | | | |
| Total Awards | | 0.0% | | | | | | | | | 0.0% |
| No. of Awards | | 0.1% | | | | | | | | | 0.0% |
| TEMPLE UNIVERSITY | | | | | | | | | | | |
| Total Awards | 5.1% | 5.7% | 4.1% | 4.1% | 4.1% | 4.1% | 3.8% | 3.3% | 3.2% | 3.2% | 3.9% |
| No. of Awards | 5.9% | 5.9% | 4.7% | 4.4% | 4.3% | 4.3% | 4.2% | 4.0% | 3.8% | 3.5% | 4.4% |
| THAR DESIGNS, INC. | | | | | | | | | | | |
| Total Awards | | | | | | 0.0% | | | | | 0.0% |
| No. of Awards | | | | | | 0.0% | | | | | 0.0% |
| THERACHEM RESEARCH | | | | | | | | | | | |
| Total Awards | | | | | | | | | 0.0% | | 0.0% |
| No. of Awards | | | | | | | | | 0.0% | | 0.0% |
| THOMAS JEFFERSON UNIVERSITY | | | | | | | | | | | |
| Total Awards | 5.0% | 4.6% | 5.6% | 6.3% | 7.2% | 8.1% | 8.2% | 8.2% | 7.4% | 7.6% | 7.0% |
| No. of Awards | 5.6% | 5.2% | 5.8% | 7.0% | 7.3% | 8.1% | 8.2% | 8.0% | 7.9% | 7.8% | 7.2% |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| THREE-DIMENSIONAL PHARMACEUTICALS, INC. | | | | | | | | | | | |
| Total Awards | | | | | | | 0.0% | 0.1% | 0.1% | | 0.0% |
| No. of Awards | | | | | | | 0.1% | 0.0% | 0.0% | | 0.0% |
| TOTTS GAP MEDICAL RESEARCH LABORATORIES | | | | | | | | | | | |
| Total Awards | | | | | 0.0% | | | 0.0% | | | 0.0% |
| No. of Awards | | | | | 0.0% | | | 0.0% | | | 0.0% |
| TRANSICOIL, INC. | | | | | | | | | | | |
| Total Awards | | | | | | | 0.2% | 0.2% | 0.2% | 0.1% | 0.1% |
| No. of Awards | | | | | | | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| U.S. BIOSCIENCE, INC. | | | | | | | | | | | |
| Total Awards | | | | | | | | | 0.1% | 0.1% | 0.0% |
| No. of Awards | | | | | | | | | 0.0% | 0.0% | 0.0% |
| UGM LABORATORY, INC. | | | | | | | | | | | |
| Total Awards | | | | | | | 0.0% | | | | 0.0% |
| No. of Awards | | | | | | | 0.0% | | | | 0.0% |
| UGM MEDICAL SYSTEMS, INC. | | | | | | | | | | | |
| Total Awards | | 0.1% | 0.1% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | | | 0.0% |
| No. of Awards | | 0.1% | 0.1% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | | | 0.0% |
| ULTRA VOICE | | | | | | | | | | | |
| Total Awards | | | 0.0% | | | | 0.0% | 0.0% | | | 0.0% |
| No. of Awards | | | 0.0% | | | | 0.0% | 0.0% | | | 0.0% |
| UNISYS | | | | | | | | | | | |
| Total Awards | 0.1% | 0.1% | | | | | 0.0% | 0.0% | 0.0% | | 0.0% |
| No. of Awards | 0.1% | 0.1% | | | | | 0.0% | 0.0% | 0.0% | | 0.0% |
| UNIVERSITY CITY SCIENCE CENTER | | | | | | | | | | | |
| Total Awards | 1.3% | 0.9% | 0.7% | 0.6% | 0.6% | 0.3% | 0.3% | 0.2% | 0.1% | 0.1% | 0.5% |
| No. of Awards | 1.0% | 0.7% | 0.6% | 0.4% | 0.4% | 0.3% | 0.3% | 0.1% | 0.2% | 0.1% | 0.4% |
| UNIVERSITY OF PENNSYLVANIA | | | | | | | | | | | |
| Total Awards | 28.5% | 29.2% | 28.7% | 27.7% | 28.1% | 29.2% | 29.5% | 30.3% | 31.9% | 33.5% | 29.9% |
| No. of Awards | 26.7% | 28.1% | 27.3% | 26.7% | 27.6% | 29.0% | 29.4% | 30.5% | 30.3% | 31.8% | 28.9% |
| UNIVERSITY OF PITTSBURGH AT PITTSBURGH | | | | | | | | | | | |
| Total Awards | 19.8% | 21.4% | 22.3% | 24.8% | 24.4% | 23.2% | 23.8% | 22.1% | 22.3% | 23.0% | 22.8% |
| No. of Awards | 19.6% | 19.5% | 20.4% | 21.4% | 21.2% | 21.7% | 21.4% | 22.0% | 21.2% | 21.4% | 21.0% |
| UNIVERSITY OF SCRANTON | | | | | | | | | | | |
| Total Awards | | | | 0.0% | | | | | 0.0% | | 0.0% |
| No. of Awards | | | | 0.0% | | | | | 0.0% | | 0.0% |
| UNIVERSITY OF THE SCIENCES PHILADELPHIA | | | | | | | | | | | |
| Total Awards | 0.1% | 0.1% | 0.1% | 0.0% | 0.0% | 0.1% | 0.1% | 0.0% | 0.0% | 0.0% | 0.0% |
| No. of Awards | 0.2% | 0.2% | 0.1% | 0.0% | 0.0% | 0.2% | 0.2% | 0.1% | 0.1% | 0.1% | 0.1% |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VILLANOVA UNIVERSITY | | | | | | | | | | | |
| Total Awards | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% | 0.0% | 0.0% | | 0.0% | 0.0% |
| No. of Awards | 0.3% | 0.3% | 0.2% | 0.2% | 0.1% | 0.1% | 0.0% | 0.0% | | 0.0% | 0.1% |
| VIRAL THERAPEUTICS, INC. | | | | | | | | | | | |
| Total Awards | | | | | | | | 0.0% | | | 0.0% |
| No. of Awards | | | | | | | | 0.0% | | | 0.0% |
| VIROPHARMA, INC. | | | | | | | | | | | |
| Total Awards | | | | | | | 0.0% | 0.0% | | | 0.0% |
| No. of Awards | | | | | | | 0.0% | 0.0% | | | 0.0% |
| VISITING NURSES ASSOCIATION SRVS & FDN | | | | | | | | | | | |
| Total Awards | | | | | | | | | | 0.0% | 0.0% |
| No. of Awards | | | | | | | | | | 0.0% | 0.0% |
| WALTERS SCIENTIFIC INSTRUMENT LABS | | | | | | | | | | | |
| Total Awards | | | | | | 0.0% | 0.0% | | | | 0.0% |
| No. of Awards | | | | | | 0.0% | 0.0% | | | | 0.0% |
| WEIS CENTER FOR RESEARCH-GEISINGER CLNIC | | | | | | | | | | | |
| Total Awards | 0.0% | 0.1% | 0.2% | 0.3% | 0.5% | 0.5% | 0.5% | 0.3% | 0.2% | 0.0% | 0.3% |
| No. of Awards | 0.1% | 0.2% | 0.3% | 0.5% | 0.8% | 0.8% | 0.7% | 0.6% | 0.3% | 0.0% | 0.4% |
| WEST CHESTER UNIVERSITY OF PENNSYLVANIA | | | | | | | | | | | |
| Total Awards | 0.0% | | | 0.0% | 0.0% | | | | | | 0.0% |
| No. of Awards | 0.1% | | | 0.0% | 0.0% | | | | | | 0.0% |
| WESTERN PENNSYLVANIA HOSPITAL | | | | | | | | | | | |
| Total Awards | | 0.0% | 0.1% | 0.1% | 0.1% | | | | | | 0.0% |
| No. of Awards | | 0.1% | 0.0% | 0.0% | 0.0% | | | | | | 0.0% |
| WIDENER UNIVERSITY PENNYSLVANIA CAMPUS | | | | | | | | | | | |
| Total Awards | | | 0.0% | | | | | | | | 0.0% |
| No. of Awards | | | 0.0% | | | | | | | | 0.0% |
| WILHELMY FINE PARTICLES | | | | | | | | | | | |
| Total Awards | | | | 0.0% | | | | | | | 0.0% |
| No. of Awards | | | | 0.0% | | | | | | | 0.0% |
| WILLS EYE HOSPITAL (PHILADELPHIA) | | | | | | | | | | | |
| Total Awards | 0.2% | 0.1% | 0.1% | 0.0% | 0.0% | 0.0% | 0.1% | 0.1% | 0.0% | 0.0% | 0.1% |
| No. of Awards | 0.5% | 0.3% | 0.3% | 0.1% | 0.1% | 0.2% | 0.2% | 0.1% | 0.1% | 0.1% | 0.2% |
| WISTAR INSTITUTE | | | | | | | | | | | |
| Total Awards | 5.8% | 5.2% | 4.7% | 3.7% | 2.7% | 2.2% | 2.1% | 2.0% | 1.8% | 2.1% | 3.0% |
| No. of Awards | 4.0% | 3.7% | 3.4% | 2.7% | 2.1% | 1.9% | 1.7% | 1.5% | 1.6% | 1.8% | 2.4% |
| YORK HOSPITAL (YORK, PA) | | | | | | | | | | | |
| Total Awards | | | | | | | 0.0% | | | | 0.0% |
| No. of Awards | | | | | | | 0.0% | | | | 0.0% |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ZIVIC MILLER LABORATORIES, INC. | | | | | | | | | | | |
| Total Awards | | | | 0.0% | | | | | | | 0.0% |
| No. of Awards | | | | 0.0% | | | | | | | 0.0% |
| ZYNAXIS, INC. | | | | | | | | | | | |
| Total Awards | 0.0% | 0.0% | 0.1% | 0.1% | | | 0.1% | 0.1% | | | 0.0% |
| No. of Awards | 0.1% | 0.1% | 0.1% | 0.1% | | | 0.0% | 0.1% | | | 0.0% |
| PA TOTAL | | | | | | | | | | | |
| Total Awards | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |
| No. of Awards | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |

SOURCE: Data provided by the Office of Reports and Analysis, Office of Extramural Research, National Institutes of Health, Bethesda, MD, August 1999.

APPENDIX B - 1
TOTAL NIH AWARDS TO INDIVIDUAL PENNSYLVANIA MEDICAL SCHOOLS*
Total Awards, No. of Awards and Average Awards
1989 to 1998

| Institution | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 10-Year Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ALLEGHENY UNIVERSITY OF HEALTH SCIENCES | | | | | | | | | | | |
| Total Awards | $9,764,413 | $13,256,722 | $17,679,996 | $16,195,987 | $15,896,544 | $16,243,949 | $23,166,539 | $24,141,791 | $29,778,248 | $29,162,204 | $195,286,393 |
| No. of Awards | 58 | 63 | 77 | 71 | 70 | 72 | 109 | 111 | 127 | 123 | 881 |
| Average Awards | $168,352 | $210,424 | $229,610 | $228,112 | $227,093 | $225,610 | $212,537 | $217,494 | $234,474 | $237,091 | $221,664 |
| HAHNEMANN UNIVERSITY | | | | | | | | | | | |
| Total Awards | $8,125,296 | $6,060,597 | $9,118,518 | $9,052,506 | $8,802,447 | $7,821,988 | | | | | $48,981,352 |
| No. of Awards | 43 | 36 | 39 | 37 | 41 | 39 | | | | | 235 |
| Average Awards | $188,960 | $168,350 | $233,808 | $244,662 | $214,694 | $200,564 | | | | | $208,431 |
| PENNSYLVANIA STATE UNIVERSITY HERSHEY MEDICAL CENTER | | | | | | | | | | | |
| Total Awards | $15,866,443 | $18,269,365 | $19,688,414 | $23,714,577 | $23,293,978 | $23,466,104 | $25,374,662 | $30,336,312 | $27,259,603 | $29,423,619 | $236,693,077 |
| No. of Awards | 90 | 93 | 103 | 109 | 108 | 103 | 110 | 116 | 127 | 128 | 1,087 |
| Average Awards | $176,294 | $196,445 | $191,150 | $217,565 | $215,685 | $227,826 | $230,679 | $261,520 | $214,643 | $229,872 | $217,749 |
| TEMPLE UNIVERSITY | | | | | | | | | | | |
| Total Awards | $17,675,040 | $19,878,719 | $14,640,229 | $15,950,155 | $17,260,255 | $18,111,171 | $18,926,661 | $17,898,227 | $18,335,513 | $19,918,178 | $178,594,148 |
| No. of Awards | 96 | 97 | 85 | 80 | 79 | 82 | 84 | 86 | 85 | 82 | 856 |
| Average Awards | $184,115 | $204,935 | $172,238 | $199,377 | $218,484 | $220,868 | $225,317 | $208,119 | $215,712 | $242,905 | $208,638 |
| THOMAS JEFFERSON UNIVERSITY | | | | | | | | | | | |
| Total Awards | $18,726,943 | $18,706,814 | $25,797,111 | $31,742,291 | $37,382,730 | $43,661,957 | $48,445,150 | $49,623,476 | $50,011,137 | $55,112,741 | $379,210,350 |
| No. of Awards | 106 | 103 | 126 | 149 | 158 | 183 | 193 | 190 | 202 | 208 | 1,618 |
| Average Awards | $176,669 | $181,620 | $204,739 | $213,036 | $236,600 | $238,590 | $251,011 | $261,176 | $247,580 | $264,965 | $234,370 |
| UNIVERSITY OF PENNSYLVANIA | | | | | | | | | | | |
| Total Awards | $81,746,415 | $90,711,576 | $102,297,223 | $109,640,682 | $117,178,447 | $126,077,654 | $140,513,320 | $148,991,761 | $175,260,976 | $201,025,270 | $1,293,443,324 |
| No. of Awards | 348 | 388 | 414 | 427 | 445 | 491 | 530 | 558 | 595 | 666 | 4,862 |
| Average Awards | $234,903 | $233,793 | $247,095 | $256,770 | $263,322 | $256,777 | $265,119 | $267,010 | $294,556 | $301,840 | $266,031 |
| UNIVERSITY OF PITTSBURGH | | | | | | | | | | | |
| Total Awards | $51,421,149 | $59,114,545 | $73,416,885 | $95,096,028 | $92,154,535 | $92,157,390 | $106,860,236 | $99,134,775 | $108,218,209 | $123,807,877 | $901,381,629 |
| No. of Awards | 256 | 255 | 294 | 318 | 306 | 339 | 365 | 383 | 396 | 419 | 3,331 |
| Average Awards | $200,864 | $231,822 | $249,717 | $299,044 | $301,159 | $271,851 | $292,768 | $258,838 | $273,278 | $295,484 | $270,604 |
| PA TOTAL | | | | | | | | | | | |
| Total Awards | $203,325,699 | $225,998,338 | $262,638,376 | $301,392,226 | $311,968,936 | $327,540,213 | $363,286,568 | $370,126,342 | $408,863,686 | $458,449,889 | $3,233,590,273 |
| No. of Awards | 997 | 1,035 | 1,138 | 1,191 | 1,207 | 1,309 | 1,391 | 1,444 | 1,532 | 1,626 | 12,870 |
| Average Awards | $203,938 | $218,356 | $230,789 | $253,058 | $258,466 | $250,222 | $261,169 | $256,320 | $266,882 | $281,950 | $251,250 |

*Awards include research and non-research awards.

SOURCE: Data provided by the Office of Reports and Analysis, Office of Extramural Research, National Institutes of Health, Bethesda, MD, August 1999.

APPENDIX B - 2

GROWTH OF TOTAL NIH AWARDS TO INDIVIDUAL PENNSYLVANIA MEDICAL SCHOOLS*

Total Awards, No. of Awards and Average Awards

1989 to 1998

| Institution | 1989 to 1990 | 1990 to 1991 | 1991 to 1992 | 1992 to 1993 | 1993 to 1994 | 1994 to 1995 | 1995 to 1996 | 1996 to 1997 | 1997 to 1998 | 10-Year Growth** |
|---|---|---|---|---|---|---|---|---|---|---|
| ALLEGHENY UNIVERSITY OF HEALTH SCIENCES | | | | | | | | | | |
| Total Awards | 35.8% | 33.4% | -8.4% | -1.8% | 2.2% | 42.6% | 4.2% | 23.3% | -2.1% | 22.1% |
| No. of Awards | 8.6% | 22.2% | -7.8% | -1.4% | 2.9% | 51.4% | 1.8% | 14.4% | -3.1% | 12.5% |
| Average Awards | 25.0% | 9.1% | -0.7% | -0.4% | -0.7% | -5.8% | 2.3% | 7.8% | 1.1% | 4.5% |
| HAHNEMANN UNIVERSITY | | | | | | | | | | |
| Total Awards | -25.4% | 50.5% | -0.7% | -2.8% | -11.1% | | | | | -0.7% |
| No. of Awards | -16.3% | 8.3% | -5.1% | 10.8% | -4.9% | | | | | -1.9% |
| Average Awards | -10.9% | 38.9% | 4.6% | -12.2% | -6.6% | | | | | 1.2% |
| PENNSYLVANIA STATE UNIVERSITY HERSHEY MEDICAL CENTER | | | | | | | | | | |
| Total Awards | 15.1% | 7.8% | 20.4% | -1.8% | 0.7% | 8.1% | 19.6% | -10.1% | 7.9% | 9.5% |
| No. of Awards | 3.3% | 10.8% | 5.8% | -0.9% | -4.6% | 6.8% | 5.5% | 9.5% | 0.8% | 4.7% |
| Average Awards | 11.4% | -2.7% | 13.8% | -0.9% | 5.6% | 1.3% | 13.4% | -17.9% | 7.1% | 3.4% |
| TEMPLE UNIVERSITY | | | | | | | | | | |
| Total Awards | 12.5% | -26.4% | 8.9% | 8.2% | 4.9% | 4.5% | -5.4% | 2.4% | 8.6% | 1.4% |
| No. of Awards | 1.0% | -12.4% | -5.9% | -1.3% | 3.8% | 2.4% | 2.4% | -1.2% | -3.5% | -1.6% |
| Average Awards | 11.3% | -16.0% | 15.8% | 9.6% | 1.1% | 2.0% | -7.6% | 3.6% | 12.6% | 3.5% |
| THOMAS JEFFERSON UNIVERSITY | | | | | | | | | | |
| Total Awards | -0.1% | 37.9% | 23.0% | 17.8% | 16.8% | 11.0% | 2.4% | 0.8% | 10.2% | 21.6% |
| No. of Awards | -2.8% | 22.3% | 18.3% | 6.0% | 15.8% | 5.5% | -1.6% | 6.3% | 3.0% | 10.7% |
| Average Awards | 2.8% | 12.7% | 4.1% | 11.1% | 0.8% | 5.2% | 4.0% | -5.2% | 7.0% | 5.6% |
| UNIVERSITY OF PENNSYLVANIA | | | | | | | | | | |
| Total Awards | 11.0% | 12.8% | 7.2% | 6.9% | 7.6% | 11.4% | 6.0% | 17.6% | 14.7% | 16.2% |
| No. of Awards | 11.5% | 6.7% | 3.1% | 4.2% | 10.3% | 7.9% | 5.3% | 6.6% | 11.9% | 10.2% |
| Average Awards | -0.5% | 5.7% | 3.9% | 2.6% | -2.5% | 3.2% | 0.7% | 10.3% | 2.5% | 3.2% |
| UNIVERSITY OF PITTSBURGH | | | | | | | | | | |
| Total Awards | 15.0% | 24.2% | 29.5% | -3.1% | 0.0% | 16.0% | -7.2% | 9.2% | 14.4% | 15.6% |
| No. of Awards | -0.4% | 15.3% | 8.2% | -3.8% | 10.8% | 7.7% | 4.9% | 3.4% | 5.8% | 7.1% |
| Average Awards | 15.4% | 7.7% | 19.8% | 0.7% | -9.7% | 7.7% | -11.6% | 5.6% | 8.1% | 5.2% |
| PA TOTAL | | | | | | | | | | |
| Total Awards | 11.2% | 16.2% | 14.8% | 3.5% | 5.0% | 10.9% | 1.9% | 10.5% | 12.1% | 13.9% |
| No. of Awards | 3.8% | 10.0% | 4.7% | 1.3% | 8.5% | 6.3% | 3.8% | 6.1% | 6.1% | 7.0% |
| Average Awards | 7.1% | 5.7% | 9.6% | 2.1% | -3.2% | 4.4% | -1.9% | 4.1% | 5.6% | 4.3% |

*Awards include research and non-research awards.

**Average annual growth rate.

SOURCE: Calculations based on data provided by the Office of Reports and Analysis, Office of Extramural Research, National Institutes of Health, Bethesda, MD, August 1999.

APPENDIX B - 3
STATE SHARES OF TOTAL NIH AWARDS TO INDIVIDUAL PENNSYLVANIA MEDICAL SCHOOLS*
Total Awards and No. of Awards
1989 to 1998

| Institution | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 10-Year Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ALLEGHENY UNIVERSITY OF HEALTH SCIENCES | | | | | | | | | | | |
| Total Awards | 4.8% | 5.9% | 6.7% | 5.4% | 5.1% | 5.0% | 6.4% | 6.5% | 7.3% | 6.4% | 6.0% |
| No. of Awards | 5.8% | 6.1% | 6.8% | 6.0% | 5.8% | 5.5% | 7.8% | 7.7% | 8.3% | 7.6% | 6.8% |
| HAHNEMANN UNIVERSITY | | | | | | | | | | | |
| Total Awards | 4.0% | 2.7% | 3.5% | 3.0% | 2.8% | 2.4% | | | | | 1.5% |
| No. of Awards | 4.3% | 3.5% | 3.4% | 3.1% | 3.4% | 3.0% | | | | | 1.8% |
| PENNSYLVANIA STATE UNIVERSITY HERSHEY MEDICAL CENTER | | | | | | | | | | | |
| Total Awards | 7.8% | 8.1% | 7.5% | 7.9% | 7.5% | 7.2% | 7.0% | 8.2% | 6.7% | 6.4% | 7.3% |
| No. of Awards | 9.0% | 9.0% | 9.1% | 9.2% | 8.9% | 7.9% | 7.9% | 8.0% | 8.3% | 7.9% | 8.4% |
| TEMPLE UNIVERSITY | | | | | | | | | | | |
| Total Awards | 8.7% | 8.8% | 5.6% | 5.3% | 5.5% | 5.5% | 5.2% | 4.8% | 4.5% | 4.3% | 5.5% |
| No. of Awards | 9.6% | 9.4% | 7.5% | 6.7% | 6.5% | 6.3% | 6.0% | 6.0% | 5.5% | 5.0% | 6.7% |
| THOMAS JEFFERSON UNIVERSITY | | | | | | | | | | | |
| Total Awards | 9.2% | 8.3% | 9.8% | 10.5% | 12.0% | 13.3% | 13.3% | 13.4% | 12.2% | 12.0% | 11.7% |
| No. of Awards | 10.6% | 10.0% | 11.1% | 12.5% | 13.1% | 14.0% | 13.9% | 13.2% | 13.2% | 12.8% | 12.6% |
| UNIVERSITY OF PENNSYLVANIA | | | | | | | | | | | |
| Total Awards | 40.2% | 40.1% | 38.9% | 36.4% | 37.6% | 38.5% | 38.7% | 40.3% | 42.9% | 43.8% | 40.0% |
| No. of Awards | 34.9% | 37.5% | 36.4% | 35.9% | 36.9% | 37.5% | 38.1% | 38.6% | 38.8% | 41.0% | 37.8% |
| UNIVERSITY OF PITTSBURGH | | | | | | | | | | | |
| Total Awards | 25.3% | 26.2% | 28.0% | 31.6% | 29.5% | 28.1% | 29.4% | 26.8% | 26.5% | 27.0% | 27.9% |
| No. of Awards | 25.7% | 24.6% | 25.8% | 26.7% | 25.4% | 25.9% | 26.2% | 26.5% | 25.8% | 25.8% | 25.9% |
| PA TOTAL | | | | | | | | | | | |
| Total Awards | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |
| No. of Awards | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |

*Awards include research and non-research awards.

SOURCE: Data provided by the Office of Reports and Analysis, Office of Extramural Research, National Institutes of Health, Bethesda, MD, August 1999.

APPENDIX C - 1
TOTAL NIH AWARDS TO ALL INSTITUTIONS IN ALL STATES
Total Awards, No. of Awards and Average Awards
1989 to 1998

| State | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ALABAMA | | | | | | | | | | | |
| Total Awards | $94,983,413 | $97,295,904 | $107,279,300 | $110,786,291 | $114,706,719 | $134,537,211 | $135,379,644 | $152,908,618 | $154,559,742 | $166,254,553 | $1,268,691,395 |
| No. of Awards | 485 | 467 | 496 | 481 | 499 | 523 | 532 | 547 | 554 | 559 | 5,143 |
| Average Awards | $195,842 | $208,342 | $216,289 | $230,325 | $229,873 | $257,241 | $254,473 | $279,540 | $278,989 | $297,414 | $246,683 |
| ALASKA | | | | | | | | | | | |
| Total Awards | $755,848 | $800,975 | $1,487,450 | $1,839,495 | $2,167,681 | $2,307,618 | $1,551,202 | $2,636,262 | $2,463,940 | $2,552,699 | $18,563,170 |
| No. of Awards | 9 | 10 | 13 | 12 | 14 | 16 | 11 | 17 | 12 | 10 | 124 |
| Average Awards | $83,983 | $80,098 | $114,419 | $153,291 | $154,834 | $144,226 | $141,018 | $155,074 | $205,328 | $255,270 | $149,703 |
| ARIZONA | | | | | | | | | | | |
| Total Awards | $49,617,145 | $57,664,041 | $64,236,625 | $68,522,632 | $69,840,858 | $71,135,308 | $74,170,420 | $71,502,948 | $77,015,380 | $86,449,876 | $690,155,233 |
| No. of Awards | 273 | 303 | 347 | 328 | 309 | 298 | 296 | 289 | 315 | 347 | 3,105 |
| Average Awards | $181,748 | $190,310 | $185,120 | $208,910 | $226,022 | $238,709 | $250,576 | $247,415 | $244,493 | $249,135 | $222,272 |
| ARKANSAS | | | | | | | | | | | |
| Total Awards | $8,298,364 | $9,405,846 | $12,237,013 | $14,488,469 | $15,517,669 | $18,899,010 | $20,776,500 | $20,963,174 | $20,251,276 | $24,841,589 | $165,678,910 |
| No. of Awards | 83 | 84 | 98 | 88 | 92 | 107 | 111 | 107 | 97 | 113 | 980 |
| Average Awards | $99,980 | $111,974 | $124,867 | $164,642 | $168,670 | $176,626 | $187,176 | $195,918 | $208,776 | $219,837 | $169,060 |
| CALIFORNIA | | | | | | | | | | | |
| Total Awards | $966,709,302 | $1,025,210,701 | $1,060,148,409 | $1,159,603,014 | $1,186,522,434 | $1,254,842,000 | $1,411,017,015 | $1,474,469,534 | $1,582,756,101 | $1,662,476,656 | $12,783,755,166 |
| No. of Awards | 4,581 | 4,685 | 4,822 | 4,799 | 4,749 | 4,866 | 4,915 | 4,959 | 5,103 | 5,303 | 48,782 |
| Average Awards | $211,026 | $218,828 | $219,857 | $241,634 | $249,847 | $257,880 | $287,084 | $297,332 | $310,162 | $313,497 | $262,059 |
| COLORADO | | | | | | | | | | | |
| Total Awards | $95,276,780 | $107,662,766 | $116,982,219 | $129,274,294 | $145,038,087 | $163,806,628 | $155,983,109 | $163,666,723 | $181,947,532 | $192,406,027 | $1,452,044,165 |
| No. of Awards | 596 | 620 | 643 | 634 | 647 | 715 | 673 | 692 | 758 | 777 | 6,755 |
| Average Awards | $159,860 | $173,650 | $181,932 | $203,903 | $224,170 | $229,100 | $231,773 | $236,513 | $240,036 | $247,627 | $214,958 |
| CONNECTICUT | | | | | | | | | | | |
| Total Awards | $174,000,826 | $180,784,719 | $193,550,709 | $211,436,259 | $209,227,768 | $218,784,271 | $224,402,151 | $234,369,577 | $246,757,143 | $253,977,940 | $2,147,291,363 |
| No. of Awards | 829 | 818 | 851 | 853 | 843 | 875 | 843 | 853 | 881 | 879 | 8,525 |
| Average Awards | $209,892 | $221,008 | $227,439 | $247,874 | $248,194 | $250,039 | $266,195 | $274,759 | $280,088 | $288,940 | $251,882 |
| DELAWARE | | | | | | | | | | | |
| Total Awards | $4,047,034 | $6,226,281 | $6,113,473 | $5,642,494 | $4,614,861 | $6,292,291 | $5,178,464 | $7,496,970 | $7,172,636 | $7,584,821 | $60,369,325 |
| No. of Awards | 32 | 30 | 32 | 24 | 24 | 27 | 25 | 33 | 35 | 37 | 299 |
| Average Awards | $126,470 | $207,543 | $191,046 | $235,104 | $192,286 | $233,048 | $207,139 | $227,181 | $204,932 | $204,995 | $201,904 |
| DIST. OF COLUMBIA | | | | | | | | | | | |
| Total Awards | $82,452,457 | $91,212,858 | $104,838,813 | $111,203,798 | $127,694,923 | $140,306,606 | $145,921,855 | $141,268,927 | $137,800,412 | $147,224,801 | $1,229,925,450 |
| No. of Awards | 351 | 364 | 407 | 404 | 424 | 448 | 404 | 403 | 400 | 404 | 4,009 |
| Average Awards | $234,907 | $250,585 | $257,589 | $275,257 | $301,167 | $313,184 | $361,193 | $350,543 | $344,501 | $364,418 | $306,791 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| FLORIDA | | | | | | | | | | | |
| Total Awards | $101,252,859 | $102,343,134 | $110,353,080 | $118,680,647 | $125,161,447 | $136,873,882 | $132,590,935 | $135,887,956 | $148,271,853 | $160,398,609 | $1,271,814,402 |
| No. of Awards | 613 | 590 | 616 | 611 | 617 | 604 | 572 | 563 | 605 | 614 | 6,005 |
| Average Awards | $165,176 | $173,463 | $179,145 | $194,240 | $202,855 | $226,612 | $231,802 | $241,364 | $245,077 | $261,236 | $211,793 |
| GEORGIA | | | | | | | | | | | |
| Total Awards | $82,510,379 | $87,556,360 | $97,800,950 | $107,272,908 | $118,058,666 | $123,994,954 | $123,208,261 | $128,282,859 | $148,400,819 | $165,461,654 | $1,182,547,810 |
| No. of Awards | 494 | 491 | 530 | 539 | 578 | 580 | 573 | 567 | 621 | 667 | 5,640 |
| Average Awards | $167,025 | $178,323 | $184,530 | $199,022 | $204,254 | $213,784 | $215,023 | $226,248 | $238,971 | $248,068 | $209,672 |
| HAWAII | | | | | | | | | | | |
| Total Awards | $12,075,820 | $15,114,280 | $15,561,175 | $16,585,947 | $19,601,671 | $24,749,103 | $21,685,367 | $20,286,337 | $20,829,970 | $21,612,342 | $188,102,012 |
| No. of Awards | 64 | 65 | 67 | 69 | 65 | 69 | 53 | 50 | 50 | 51 | 603 |
| Average Awards | $188,685 | $232,527 | $232,256 | $240,376 | $301,564 | $358,683 | $409,158 | $405,727 | $416,599 | $423,771 | $311,944 |
| IDAHO | | | | | | | | | | | |
| Total Awards | $1,325,013 | $1,641,792 | $1,281,120 | $1,325,985 | $1,085,417 | $1,191,756 | $1,068,421 | $1,586,642 | $1,402,333 | $1,370,466 | $13,278,945 |
| No. of Awards | 19 | 20 | 17 | 15 | 11 | 13 | 9 | 12 | 9 | 10 | 135 |
| Average Awards | $69,738 | $82,090 | $75,360 | $88,399 | $98,674 | $91,674 | $118,713 | $132,220 | $155,815 | $137,047 | $98,363 |
| ILLINOIS | | | | | | | | | | | |
| Total Awards | $209,552,930 | $213,417,454 | $229,996,623 | $245,246,665 | $248,583,156 | $266,104,091 | $282,814,638 | $302,330,415 | $321,311,322 | $348,452,107 | $2,667,809,401 |
| No. of Awards | 1,298 | 1,265 | 1,304 | 1,285 | 1,228 | 1,272 | 1,275 | 1,295 | 1,336 | 1,423 | 12,981 |
| Average Awards | $161,443 | $168,709 | $176,378 | $190,853 | $202,429 | $209,201 | $221,815 | $233,460 | $240,502 | $244,871 | $205,516 |
| INDIANA | | | | | | | | | | | |
| Total Awards | $62,336,210 | $66,377,408 | $75,342,335 | $83,727,102 | $87,669,651 | $89,897,547 | $93,664,483 | $97,875,179 | $104,481,264 | $110,791,640 | $872,162,819 |
| No. of Awards | 401 | 412 | 447 | 470 | 458 | 453 | 429 | 442 | 463 | 472 | 4,447 |
| Average Awards | $155,452 | $161,110 | $168,551 | $178,143 | $191,418 | $198,449 | $218,332 | $221,437 | $225,661 | $234,728 | $196,124 |
| IOWA | | | | | | | | | | | |
| Total Awards | $65,825,601 | $71,381,929 | $76,742,538 | $81,366,732 | $85,628,567 | $85,216,611 | $89,359,741 | $91,915,355 | $97,691,968 | $109,481,025 | $854,610,067 |
| No. of Awards | 403 | 374 | 384 | 378 | 373 | 342 | 336 | 338 | 360 | 405 | 3,693 |
| Average Awards | $163,339 | $190,861 | $199,850 | $215,256 | $229,567 | $249,171 | $265,952 | $271,939 | $271,367 | $270,324 | $231,414 |
| KANSAS | | | | | | | | | | | |
| Total Awards | $20,670,203 | $23,428,882 | $29,860,413 | $26,063,582 | $29,578,576 | $29,880,840 | $33,870,367 | $35,682,906 | $33,672,338 | $43,936,082 | $306,644,189 |
| No. of Awards | 175 | 171 | 183 | 162 | 176 | 169 | 171 | 169 | 164 | 187 | 1,727 |
| Average Awards | $118,115 | $137,011 | $163,172 | $160,886 | $168,060 | $176,810 | $198,072 | $211,141 | $205,319 | $234,952 | $177,559 |
| KENTUCKY | | | | | | | | | | | |
| Total Awards | $22,972,435 | $23,145,606 | $28,147,106 | $34,882,668 | $37,279,084 | $38,329,361 | $38,136,693 | $43,167,946 | $47,426,183 | $47,835,106 | $361,322,188 |
| No. of Awards | 169 | 170 | 198 | 233 | 238 | 231 | 218 | 246 | 252 | 261 | 2,216 |
| Average Awards | $135,932 | $136,151 | $142,157 | $149,711 | $156,635 | $165,928 | $174,939 | $175,479 | $188,199 | $183,276 | $163,052 |
| LOUISIANA | | | | | | | | | | | |
| Total Awards | $47,326,598 | $48,816,040 | $58,254,980 | $59,719,594 | $55,623,366 | $59,386,193 | $54,517,778 | $57,882,478 | $62,263,902 | $66,487,576 | $570,278,505 |
| No. of Awards | 276 | 261 | 277 | 261 | 236 | 267 | 249 | 266 | 287 | 285 | 2,665 |
| Average Awards | $171,473 | $187,035 | $210,307 | $228,811 | $235,692 | $222,420 | $218,947 | $217,603 | $216,947 | $233,290 | $213,988 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MAINE | | | | | | | | | | | |
| Total Awards | $13,173,822 | $21,984,346 | $22,598,690 | $13,808,146 | $16,111,244 | $19,171,460 | $21,343,509 | $23,791,566 | $25,296,737 | $30,481,756 | $207,761,276 |
| No. of Awards | 74 | 69 | 73 | 59 | 60 | 71 | 84 | 83 | 94 | 108 | 775 |
| Average Awards | $178,025 | $318,614 | $309,571 | $234,036 | $268,521 | $270,021 | $254,089 | $286,645 | $269,114 | $282,238 | $268,079 |
| MARYLAND | | | | | | | | | | | |
| Total Awards | $462,885,440 | $415,092,407 | $473,148,334 | $508,139,161 | $560,097,682 | $617,533,624 | $594,435,828 | $648,244,926 | $636,374,788 | $681,605,722 | $5,597,557,912 |
| No. of Awards | 1,532 | 1,584 | 1,652 | 1,660 | 1,687 | 1,756 | 1,699 | 1,692 | 1,737 | 1,827 | 16,826 |
| Average Awards | $302,145 | $262,053 | $286,409 | $306,108 | $332,008 | $351,671 | $349,874 | $383,123 | $366,364 | $373,074 | $332,673 |
| MASSACHUSETTS | | | | | | | | | | | |
| Total Awards | $667,603,287 | $707,097,728 | $767,915,365 | $817,391,512 | $851,405,642 | $900,170,912 | $932,404,594 | $1,016,643,137 | $1,084,244,633 | $1,175,256,246 | $8,920,133,056 |
| No. of Awards | 3,061 | 3,123 | 3,248 | 3,282 | 3,279 | 3,408 | 3,437 | 3,676 | 3,828 | 3,995 | 34,337 |
| Average Awards | $218,100 | $226,416 | $236,427 | $249,053 | $259,654 | $264,135 | $271,284 | $276,562 | $283,240 | $294,182 | $259,782 |
| MICHIGAN | | | | | | | | | | | |
| Total Awards | $180,264,034 | $193,878,886 | $217,035,290 | $241,385,239 | $250,847,930 | $266,853,407 | $267,830,422 | $281,113,449 | $299,932,265 | $322,679,630 | $2,521,820,552 |
| No. of Awards | 1,034 | 1,040 | 1,093 | 1,147 | 1,138 | 1,151 | 1,120 | 1,115 | 1,136 | 1,185 | 11,159 |
| Average Awards | $174,337 | $186,422 | $198,568 | $210,449 | $220,429 | $231,845 | $239,134 | $252,120 | $264,025 | $272,303 | $225,990 |
| MINNESOTA | | | | | | | | | | | |
| Total Awards | $138,039,409 | $146,435,534 | $167,806,745 | $172,293,138 | $184,920,282 | $188,148,032 | $201,771,625 | $203,732,251 | $204,282,355 | $213,471,709 | $1,820,901,080 |
| No. of Awards | 705 | 696 | 752 | 749 | 754 | 762 | 775 | 767 | 784 | 827 | 7,571 |
| Average Awards | $195,801 | $210,396 | $223,147 | $230,031 | $245,252 | $246,913 | $260,350 | $265,622 | $260,564 | $258,128 | $240,510 |
| MISSISSIPPI | | | | | | | | | | | |
| Total Awards | $10,525,079 | $10,931,260 | $10,037,846 | $9,084,358 | $13,103,038 | $13,809,830 | $14,039,967 | $12,855,557 | $14,964,185 | $16,172,808 | $125,523,928 |
| No. of Awards | 90 | 90 | 83 | 69 | 82 | 82 | 75 | 72 | 75 | 81 | 799 |
| Average Awards | $116,945 | $121,458 | $120,938 | $131,657 | $159,793 | $168,413 | $187,200 | $178,549 | $199,522 | $199,664 | $157,101 |
| MISSOURI | | | | | | | | | | | |
| Total Awards | $146,497,214 | $168,335,639 | $177,448,592 | $180,428,115 | $186,296,035 | $203,204,379 | $216,079,106 | $232,113,911 | $246,730,948 | $273,803,441 | $2,030,937,380 |
| No. of Awards | 794 | 836 | 829 | 822 | 794 | 845 | 874 | 888 | 923 | 960 | 8,565 |
| Average Awards | $184,505 | $201,358 | $214,051 | $219,499 | $234,630 | $240,479 | $247,230 | $261,390 | $267,314 | $285,212 | $237,121 |
| MONTANA | | | | | | | | | | | |
| Total Awards | $3,496,465 | $4,095,231 | $3,803,573 | $4,049,456 | $3,829,533 | $5,104,602 | $4,868,911 | $5,999,935 | $6,918,378 | $6,894,032 | $49,060,116 |
| No. of Awards | 38 | 40 | 38 | 37 | 32 | 38 | 35 | 37 | 42 | 43 | 380 |
| Average Awards | $92,012 | $102,381 | $100,094 | $109,445 | $119,673 | $134,332 | $139,112 | $162,160 | $164,723 | $160,326 | $129,106 |
| NEBRASKA | | | | | | | | | | | |
| Total Awards | $16,847,485 | $19,656,577 | $20,768,094 | $23,209,336 | $24,779,407 | $23,782,093 | $26,638,873 | $27,448,720 | $28,385,524 | $30,244,903 | $241,761,012 |
| No. of Awards | 137 | 130 | 143 | 145 | 149 | 134 | 149 | 133 | 139 | 144 | 1,403 |
| Average Awards | $122,974 | $151,204 | $145,231 | $160,064 | $166,305 | $177,478 | $178,784 | $206,381 | $204,212 | $210,034 | $172,317 |
| NEVADA | | | | | | | | | | | |
| Total Awards | $4,284,512 | $3,988,149 | $4,743,719 | $7,199,235 | $6,967,797 | $9,115,320 | $5,916,292 | $7,667,953 | $8,723,709 | $9,272,103 | $67,878,789 |
| No. of Awards | 31 | 32 | 37 | 48 | 43 | 39 | 32 | 34 | 39 | 41 | 376 |
| Average Awards | $138,210 | $124,630 | $128,209 | $149,984 | $162,042 | $233,726 | $184,884 | $225,528 | $223,685 | $226,149 | $180,529 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| NEW HAMPSHIRE | | | | | | | | | | | |
| Total Awards | $21,756,733 | $28,112,575 | $32,114,256 | $36,766,152 | $34,068,890 | $34,874,475 | $37,110,216 | $41,135,071 | $42,065,068 | $38,576,209 | $346,579,645 |
| No. of Awards | 135 | 146 | 158 | 162 | 156 | 150 | 154 | 174 | 180 | 167 | 1,582 |
| Average Awards | $161,161 | $192,552 | $203,255 | $226,952 | $218,390 | $232,497 | $240,975 | $236,408 | $233,695 | $230,995 | $219,077 |
| NEW JERSEY | | | | | | | | | | | |
| Total Awards | $75,411,553 | $85,871,268 | $89,549,048 | $89,148,487 | $95,921,098 | $98,178,473 | $106,024,100 | $109,264,374 | $115,428,975 | $124,431,200 | $989,228,576 |
| No. of Awards | 433 | 443 | 482 | 452 | 464 | 464 | 451 | 457 | 485 | 495 | 4,626 |
| Average Awards | $174,161 | $193,840 | $185,786 | $197,231 | $206,727 | $211,592 | $235,087 | $239,091 | $237,998 | $251,376 | $213,841 |
| NEW MEXICO | | | | | | | | | | | |
| Total Awards | $20,610,513 | $22,260,327 | $26,529,513 | $28,642,571 | $29,843,716 | $36,462,177 | $34,790,976 | $34,499,071 | $41,883,972 | $41,750,846 | $317,273,682 |
| No. of Awards | 121 | 128 | 151 | 149 | 150 | 152 | 146 | 129 | 137 | 142 | 1,405 |
| Average Awards | $170,335 | $173,909 | $175,692 | $192,232 | $198,958 | $239,883 | $238,294 | $267,435 | $305,722 | $294,020 | $225,818 |
| NEW YORK | | | | | | | | | | | |
| Total Awards | $800,461,541 | $825,261,278 | $879,223,119 | $931,588,711 | $919,403,600 | $959,927,735 | $955,621,609 | $985,132,790 | $1,045,184,444 | $1,130,845,532 | $9,432,650,359 |
| No. of Awards | 3,714 | 3,671 | 3,785 | 3,728 | 3,572 | 3,668 | 3,511 | 3,548 | 3,719 | 3,870 | 36,786 |
| Average Awards | $215,525 | $224,806 | $232,291 | $249,890 | $257,392 | $261,703 | $272,179 | $277,659 | $281,039 | $292,208 | $256,420 |
| NORTH CAROLINA | | | | | | | | | | | |
| Total Awards | $250,092,052 | $254,458,435 | $291,037,930 | $311,788,807 | $340,953,729 | $366,809,100 | $384,287,565 | $406,293,719 | $424,099,613 | $440,425,288 | $3,470,246,238 |
| No. of Awards | 1,156 | 1,175 | 1,238 | 1,320 | 1,348 | 1,389 | 1,383 | 1,427 | 1,479 | 1,476 | 13,391 |
| Average Awards | $216,343 | $216,560 | $235,087 | $236,204 | $252,933 | $264,081 | $277,865 | $284,719 | $286,748 | $298,391 | $259,148 |
| NORTH DAKOTA | | | | | | | | | | | |
| Total Awards | $2,168,455 | $1,357,750 | $2,007,358 | $1,994,947 | $2,073,123 | $1,770,585 | $3,251,300 | $3,045,691 | $3,226,109 | $2,229,689 | $23,125,007 |
| No. of Awards | 25 | 15 | 14 | 15 | 15 | 16 | 24 | 18 | 22 | 17 | 181 |
| Average Awards | $86,738 | $90,517 | $143,383 | $132,996 | $138,208 | $110,662 | $135,471 | $169,205 | $146,641 | $131,158 | $127,762 |
| OHIO | | | | | | | | | | | |
| Total Awards | $173,634,989 | $183,048,162 | $206,713,489 | $223,762,200 | $224,603,107 | $250,118,998 | $262,771,423 | $275,249,539 | $306,723,614 | $339,048,569 | $2,445,674,090 |
| No. of Awards | 998 | 990 | 1,072 | 1,073 | 1,043 | 1,089 | 1,106 | 1,137 | 1,221 | 1,313 | 11,042 |
| Average Awards | $173,983 | $184,897 | $192,830 | $208,539 | $215,343 | $229,678 | $237,587 | $242,084 | $251,207 | $258,224 | $221,488 |
| OKLAHOMA | | | | | | | | | | | |
| Total Awards | $16,096,261 | $16,630,410 | $19,712,239 | $21,745,152 | $21,729,018 | $23,689,696 | $26,889,023 | $31,248,927 | $31,282,176 | $35,362,397 | $244,385,299 |
| No. of Awards | 143 | 139 | 157 | 155 | 151 | 152 | 152 | 154 | 143 | 140 | 1,486 |
| Average Awards | $112,561 | $119,643 | $125,556 | $140,291 | $143,901 | $155,853 | $176,901 | $202,915 | $218,756 | $252,589 | $164,458 |
| OREGON | | | | | | | | | | | |
| Total Awards | $69,812,688 | $69,772,826 | $76,309,403 | $86,369,459 | $87,184,293 | $97,760,117 | $101,257,618 | $103,687,460 | $118,776,576 | $133,498,520 | $944,428,960 |
| No. of Awards | 420 | 440 | 449 | 461 | 449 | 458 | 464 | 471 | 500 | 531 | 4,643 |
| Average Awards | $166,221 | $158,575 | $169,954 | $187,352 | $194,174 | $213,450 | $218,228 | $220,143 | $237,553 | $251,410 | $203,409 |
| PENNSYLVANIA | | | | | | | | | | | |
| Total Awards | $383,612,649 | $406,994,015 | $464,096,480 | $513,745,945 | $523,370,790 | $543,224,853 | $589,943,373 | $616,757,551 | $681,344,904 | $735,155,571 | $5,458,246,131 |
| No. of Awards | 1,927 | 1,976 | 2,166 | 2,187 | 2,165 | 2,278 | 2,367 | 2,422 | 2,578 | 2,706 | 22,772 |
| Average Awards | $199,072 | $205,969 | $214,264 | $234,909 | $241,742 | $238,466 | $249,237 | $254,648 | $264,292 | $271,676 | $239,691 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| RHODE ISLAND | | | | | | | | | | | |
| Total Awards | $31,203,216 | $33,633,633 | $36,842,234 | $39,242,046 | $39,284,203 | $38,505,683 | $41,116,248 | $43,318,177 | $53,184,283 | $51,927,891 | $408,257,614 |
| No. of Awards | 211 | 207 | 223 | 212 | 205 | 205 | 203 | 218 | 255 | 248 | 2,187 |
| Average Awards | $147,883 | $162,481 | $165,212 | $185,104 | $191,630 | $187,833 | $202,543 | $198,707 | $208,566 | $209,387 | $186,675 |
| SOUTH CAROLINA | | | | | | | | | | | |
| Total Awards | $21,745,695 | $24,738,163 | $29,371,869 | $27,724,495 | $27,093,804 | $33,461,095 | $32,982,737 | $35,342,235 | $39,184,487 | $45,601,615 | $317,246,195 |
| No. of Awards | 165 | 175 | 187 | 171 | 157 | 177 | 171 | 166 | 165 | 194 | 1,728 |
| Average Awards | $131,792 | $141,361 | $157,069 | $162,132 | $172,572 | $189,046 | $192,882 | $212,905 | $237,482 | $235,060 | $183,592 |
| SOUTH DAKOTA | | | | | | | | | | | |
| Total Awards | $817,689 | $885,784 | $1,268,959 | $1,722,226 | $1,530,923 | $1,858,591 | $1,566,925 | $1,654,137 | $2,631,690 | $2,508,831 | $16,445,755 |
| No. of Awards | 12 | 14 | 16 | 14 | 10 | 15 | 14 | 12 | 16 | 17 | 140 |
| Average Awards | $68,141 | $63,270 | $79,310 | $123,016 | $153,092 | $123,906 | $111,923 | $137,845 | $164,481 | $147,578 | $117,470 |
| TENNESSEE | | | | | | | | | | | |
| Total Awards | $103,180,529 | $114,006,248 | $127,108,020 | $135,833,789 | $140,942,667 | $144,440,098 | $148,973,102 | $157,458,396 | $166,850,030 | $174,358,203 | $1,413,151,082 |
| No. of Awards | 551 | 592 | 636 | 634 | 620 | 638 | 625 | 646 | 676 | 704 | 6,322 |
| Average Awards | $187,260 | $192,578 | $199,855 | $214,249 | $227,327 | $226,395 | $238,357 | $243,744 | $246,820 | $247,668 | $223,529 |
| TEXAS | | | | | | | | | | | |
| Total Awards | $297,896,967 | $308,419,289 | $347,841,112 | $381,681,699 | $409,314,160 | $454,861,552 | $450,421,510 | $495,681,941 | $511,116,775 | $552,006,241 | $4,209,241,246 |
| No. of Awards | 1,770 | 1,731 | 1,858 | 1,875 | 1,881 | 1,958 | 1,929 | 1,928 | 1,991 | 2,070 | 18,991 |
| Average Awards | $168,303 | $178,174 | $187,213 | $203,564 | $217,605 | $232,309 | $233,500 | $257,096 | $256,714 | $266,670 | $221,644 |
| UTAH | | | | | | | | | | | |
| Total Awards | $50,277,563 | $52,215,038 | $58,938,874 | $63,851,303 | $60,811,365 | $60,633,035 | $72,400,120 | $67,456,276 | $77,547,402 | $78,199,114 | $642,330,090 |
| No. of Awards | 289 | 304 | 311 | 322 | 319 | 301 | 302 | 307 | 321 | 330 | 3,106 |
| Average Awards | $173,971 | $171,760 | $189,514 | $198,296 | $190,631 | $201,439 | $239,735 | $219,727 | $241,581 | $236,967 | $206,803 |
| VERMONT | | | | | | | | | | | |
| Total Awards | $28,921,341 | $30,478,237 | $35,295,666 | $32,907,602 | $32,247,815 | $29,180,704 | $26,294,941 | $26,872,368 | $26,289,574 | $29,956,598 | $298,444,846 |
| No. of Awards | 150 | 146 | 153 | 140 | 139 | 125 | 116 | 119 | 101 | 121 | 1,310 |
| Average Awards | $192,809 | $208,755 | $230,691 | $235,054 | $231,999 | $233,446 | $226,681 | $225,818 | $260,293 | $247,575 | $227,820 |
| VIRGINIA | | | | | | | | | | | |
| Total Awards | $105,565,797 | $241,979,114 | $214,247,543 | $243,494,942 | $224,234,130 | $238,004,364 | $170,567,555 | $161,098,376 | $162,247,263 | $173,262,059 | $1,934,701,143 |
| No. of Awards | 581 | 588 | 640 | 622 | 634 | 630 | 644 | 658 | 634 | 719 | 6,350 |
| Average Awards | $181,697 | $411,529 | $334,762 | $391,471 | $353,682 | $377,785 | $264,856 | $244,830 | $255,911 | $240,976 | $304,677 |
| WASHINGTON | | | | | | | | | | | |
| Total Awards | $212,349,501 | $232,594,776 | $261,586,813 | $304,147,150 | $275,523,057 | $299,139,182 | $343,642,830 | $343,121,365 | $393,028,224 | $397,352,159 | $3,062,485,057 |
| No. of Awards | 890 | 929 | 1,031 | 1,031 | 974 | 1,049 | 1,088 | 1,146 | 1,205 | 1,219 | 10,562 |
| Average Awards | $238,595 | $250,371 | $253,721 | $295,002 | $282,878 | $285,166 | $315,848 | $299,408 | $326,165 | $325,966 | $289,953 |
| WEST VIRGINIA | | | | | | | | | | | |
| Total Awards | $6,725,839 | $5,874,007 | $6,620,900 | $7,759,120 | $9,535,690 | $8,088,980 | $7,951,292 | $7,365,300 | $7,637,304 | $9,660,150 | $77,218,582 |
| No. of Awards | 57 | 55 | 53 | 55 | 57 | 54 | 43 | 45 | 46 | 47 | 512 |
| Average Awards | $117,997 | $106,800 | $124,923 | $141,075 | $167,293 | $149,796 | $184,914 | $163,673 | $166,028 | $205,535 | $150,818 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| WISCONSIN | | | | | | | | | | | |
| Total Awards | $119,986,476 | $123,204,436 | $132,164,254 | $144,051,230 | $151,979,328 | $160,901,572 | $168,708,924 | $171,883,922 | $179,490,953 | $191,272,382 | $1,543,643,477 |
| No. of Awards | 705 | 715 | 712 | 718 | 695 | 719 | 727 | 747 | 765 | 789 | 7,292 |
| Average Awards | $170,194 | $172,314 | $185,624 | $200,628 | $218,675 | $223,785 | $232,062 | $230,099 | $234,629 | $242,424 | $211,690 |
| WYOMING | | | | | | | | | | | |
| Total Awards | $1,218,202 | $1,106,895 | $1,460,276 | $1,616,206 | $1,253,278 | $669,608 | $814,633 | $955,487 | $1,164,343 | $1,907,709 | $12,166,637 |
| No. of Awards | 16 | 13 | 15 | 14 | 11 | 7 | 7 | 8 | 8 | 13 | 112 |
| Average Awards | $76,138 | $85,146 | $97,352 | $115,443 | $113,934 | $95,658 | $116,376 | $119,436 | $145,543 | $146,747 | $108,631 |
| U. S. TOTAL | | | | | | | | | | | |
| Total Awards | $6,539,152,213 | $6,983,885,399 | $7,595,559,934 | $8,194,240,511 | $8,434,860,975 | $8,995,989,613 | $9,298,014,191 | $9,762,314,384 | $10,382,717,415 | $11,108,814,692 | $87,295,549,327 |
| No. of Awards | 33,116 | 33,432 | 35,187 | 35,174 | 34,814 | 35,855 | 35,602 | 36,282 | 37,746 | 39,343 | 356,551 |
| Average Awards | $197,462 | $208,898 | $215,863 | $232,963 | $242,284 | $250,899 | $261,166 | $269,068 | $275,068 | $282,358 | $244,833 |

SOURCE: Data provided by the Office of Reports and Analysis, Office of Extramural Research, National Institutes of Health, Bethesda, MD, August 1999.

APPENDIX C - 2

GROWTH OF TOTAL NIH AWARDS TO ALL INSTITUTIONS IN ALL STATES

Total Awards, No. of Awards and Average Awards

1989 to 1998

| State | 1989 to 1990 | 1990 to 1991 | 1991 to 1992 | 1992 to 1993 | 1993 to 1994 | 1994 to 1995 | 1995 to 1996 | 1996 to 1997 | 1997 to 1998 | 10-Year Growth |
|---|---|---|---|---|---|---|---|---|---|---|
| ALABAMA | | | | | | | | | | |
| Total Awards | 2.4% | 10.3% | 3.3% | 3.5% | 17.3% | 0.6% | 12.9% | 1.1% | 7.6% | 8.3% |
| No. of Awards | -3.7% | 6.2% | -3.0% | 3.7% | 4.8% | 1.7% | 2.8% | 1.3% | 0.9% | 1.7% |
| Average Awards | 6.4% | 3.8% | 6.5% | -0.2% | 11.9% | -1.1% | 9.9% | -0.2% | 6.6% | 5.8% |
| ALASKA | | | | | | | | | | |
| Total Awards | 6.0% | 85.7% | 23.7% | 17.8% | 6.5% | -32.8% | 69.9% | -6.5% | 3.6% | 26.4% |
| No. of Awards | 11.1% | 30.0% | -7.7% | 16.7% | 14.3% | -31.3% | 54.5% | -29.4% | -16.7% | 1.2% |
| Average Awards | -4.6% | 42.8% | 34.0% | 1.0% | -6.9% | -2.2% | 10.0% | 32.4% | 24.3% | 22.7% |
| ARIZONA | | | | | | | | | | |
| Total Awards | 16.2% | 11.4% | 6.7% | 1.9% | 1.9% | 4.3% | -3.6% | 7.7% | 12.3% | 8.2% |
| No. of Awards | 11.0% | 14.5% | -5.5% | -5.8% | -3.6% | -0.7% | -2.4% | 9.0% | 10.2% | 3.0% |
| Average Awards | 4.7% | -2.7% | 12.9% | 8.2% | 5.6% | 5.0% | -1.3% | -1.2% | 1.9% | 4.1% |
| ARKANSAS | | | | | | | | | | |
| Total Awards | 13.3% | 30.1% | 18.4% | 7.1% | 21.8% | 9.9% | 0.9% | -3.4% | 22.7% | 22.2% |
| No. of Awards | 1.2% | 16.7% | -10.2% | 4.5% | 16.3% | 3.7% | -3.6% | -9.3% | 16.5% | 4.0% |
| Average Awards | 12.0% | 11.5% | 31.9% | 2.4% | 4.7% | 6.0% | 4.7% | 6.6% | 5.3% | 13.3% |
| CALIFORNIA | | | | | | | | | | |
| Total Awards | 6.1% | 3.4% | 9.4% | 2.3% | 5.8% | 12.4% | 4.5% | 7.3% | 5.0% | 8.0% |
| No. of Awards | 2.3% | 2.9% | -0.5% | -1.0% | 2.5% | 1.0% | 0.9% | 2.9% | 3.9% | 1.8% |
| Average Awards | 3.7% | 0.5% | 9.9% | 3.4% | 3.2% | 11.3% | 3.6% | 4.3% | 1.1% | 5.4% |
| COLORADO | | | | | | | | | | |
| Total Awards | 13.0% | 8.7% | 10.5% | 12.2% | 12.9% | -4.8% | 4.9% | 11.2% | 5.7% | 11.3% |
| No. of Awards | 4.0% | 3.7% | -1.4% | 2.1% | 10.5% | -5.9% | 2.8% | 9.5% | 2.5% | 3.4% |
| Average Awards | 8.6% | 4.8% | 12.1% | 9.9% | 2.2% | 1.2% | 2.0% | 1.5% | 3.2% | 6.1% |
| CONNECTICUT | | | | | | | | | | |
| Total Awards | 3.9% | 7.1% | 9.2% | -1.0% | 4.6% | 2.6% | 4.4% | 5.3% | 2.9% | 5.1% |
| No. of Awards | -1.3% | 4.0% | 0.2% | -1.2% | 3.8% | -3.7% | 1.2% | 3.3% | -0.2% | 0.7% |
| Average Awards | 5.3% | 2.9% | 9.0% | 0.1% | 0.7% | 6.5% | 3.2% | 1.9% | 3.2% | 4.2% |
| DELAWARE | | | | | | | | | | |
| Total Awards | 53.8% | -1.8% | -7.7% | -18.2% | 36.3% | -17.7% | 44.8% | -4.3% | 5.7% | 9.7% |
| No. of Awards | -6.3% | 6.7% | -25.0% | 0.0% | 12.5% | -7.4% | 32.0% | 6.1% | 5.7% | 1.7% |
| Average Awards | 64.1% | -7.9% | 23.1% | -18.2% | 21.2% | -11.1% | 9.7% | -9.8% | 0.0% | 6.9% |
| DIST. OF COLUMBIA | | | | | | | | | | |
| Total Awards | 10.6% | 14.9% | 6.1% | 14.8% | 9.9% | 4.0% | -3.2% | -2.5% | 6.8% | 8.7% |
| No. of Awards | 3.7% | 11.8% | -0.7% | 5.0% | 5.7% | -9.8% | -0.2% | -0.7% | 1.0% | 1.7% |
| Average Awards | 6.7% | 2.8% | 6.9% | 9.4% | 4.0% | 15.3% | -2.9% | -1.7% | 5.8% | 6.1% |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| FLORIDA | | | | | | | | | | |
| Total Awards | 1.1% | 7.8% | 7.5% | 5.5% | 9.4% | -3.1% | 2.5% | 9.1% | 8.2% | 6.5% |
| No. of Awards | -3.8% | 4.4% | -0.8% | 1.0% | -2.1% | -5.3% | -1.6% | 7.5% | 1.5% | 0.0% |
| Average Awards | 5.0% | 3.3% | 8.4% | 4.4% | 11.7% | 2.3% | 4.1% | 1.5% | 6.6% | 6.5% |
| GEORGIA | | | | | | | | | | |
| Total Awards | 6.1% | 11.7% | 9.7% | 10.1% | 5.0% | -0.6% | 4.1% | 15.7% | 11.5% | 11.2% |
| No. of Awards | -0.6% | 7.9% | 1.7% | 7.2% | 0.3% | -1.2% | -1.0% | 9.5% | 7.4% | 3.9% |
| Average Awards | 6.8% | 3.5% | 7.9% | 2.6% | 4.7% | 0.6% | 5.2% | 5.6% | 3.8% | 5.4% |
| HAWAII | | | | | | | | | | |
| Total Awards | 25.2% | 3.0% | 6.6% | 18.2% | 26.3% | -12.4% | -6.5% | 2.7% | 3.8% | 8.8% |
| No. of Awards | 1.6% | 3.1% | 3.0% | -5.8% | 6.2% | -23.2% | -5.7% | 0.0% | 2.0% | -2.3% |
| Average Awards | 23.2% | -0.1% | 3.5% | 25.5% | 18.9% | 14.1% | -0.8% | 2.7% | 1.7% | 13.8% |
| IDAHO | | | | | | | | | | |
| Total Awards | 23.9% | -22.0% | 3.5% | -18.1% | 9.8% | -10.3% | 48.5% | -11.6% | -2.3% | 0.4% |
| No. of Awards | 5.3% | -15.0% | -11.8% | -26.7% | 18.2% | -30.8% | 33.3% | -25.0% | 11.1% | -5.3% |
| Average Awards | 17.7% | -8.2% | 17.3% | 11.6% | -7.1% | 29.5% | 11.4% | 17.8% | -12.0% | 10.7% |
| ILLINOIS | | | | | | | | | | |
| Total Awards | 1.8% | 7.8% | 6.6% | 1.4% | 7.0% | 6.3% | 6.9% | 6.3% | 8.4% | 7.4% |
| No. of Awards | -2.5% | 3.1% | -1.5% | -4.4% | 3.6% | 0.2% | 1.6% | 3.2% | 6.5% | 1.1% |
| Average Awards | 4.5% | 4.5% | 8.2% | 6.1% | 3.3% | 6.0% | 5.2% | 3.0% | 1.8% | 5.7% |
| INDIANA | | | | | | | | | | |
| Total Awards | 6.5% | 13.5% | 11.1% | 4.7% | 2.5% | 4.2% | 4.5% | 6.7% | 6.0% | 8.6% |
| No. of Awards | 2.7% | 8.5% | 5.1% | -2.6% | -1.1% | -5.3% | 3.0% | 4.8% | 1.9% | 2.0% |
| Average Awards | 3.6% | 4.6% | 5.7% | 7.5% | 3.7% | 10.0% | 1.4% | 1.9% | 4.0% | 5.7% |
| IOWA | | | | | | | | | | |
| Total Awards | 8.4% | 7.5% | 6.0% | 5.2% | -0.5% | 4.9% | 2.9% | 6.3% | 12.1% | 7.4% |
| No. of Awards | -7.2% | 2.7% | -1.6% | -1.3% | -8.3% | -1.8% | 0.6% | 6.5% | 12.5% | 0.1% |
| Average Awards | 16.8% | 4.7% | 7.7% | 6.6% | 8.5% | 6.7% | 2.3% | -0.2% | -0.4% | 7.3% |
| KANSAS | | | | | | | | | | |
| Total Awards | 13.3% | 27.5% | -12.7% | 13.5% | 1.0% | 13.4% | 5.4% | -5.6% | 30.5% | 12.5% |
| No. of Awards | -2.3% | 7.0% | -11.5% | 8.6% | -4.0% | 1.2% | -1.2% | -3.0% | 14.0% | 0.8% |
| Average Awards | 16.0% | 19.1% | -1.4% | 4.5% | 5.2% | 12.0% | 6.6% | -2.8% | 14.4% | 11.0% |
| KENTUCKY | | | | | | | | | | |
| Total Awards | 0.8% | 21.6% | 23.9% | 6.9% | 2.8% | -0.5% | 13.2% | 9.9% | 0.9% | 12.0% |
| No. of Awards | 0.6% | 16.5% | 17.7% | 2.1% | -2.9% | -5.6% | 12.8% | 2.4% | 3.6% | 6.0% |
| Average Awards | 0.2% | 4.4% | 5.3% | 4.6% | 5.9% | 5.4% | 0.3% | 7.2% | -2.6% | 3.9% |
| LOUISIANA | | | | | | | | | | |
| Total Awards | 3.1% | 19.3% | 2.5% | -6.9% | 6.8% | -8.2% | 6.2% | 7.6% | 6.8% | 4.5% |
| No. of Awards | -5.4% | 6.1% | -5.8% | -9.6% | 13.1% | -6.7% | 6.8% | 7.9% | -0.7% | 0.4% |
| Average Awards | 9.1% | 12.4% | 8.8% | 3.0% | -5.6% | -1.6% | -0.6% | -0.3% | 7.5% | 4.0% |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| MAINE | | | | | | | | | | |
| Total Awards | 66.9% | 2.8% | -38.9% | 16.7% | 19.0% | 11.3% | 11.5% | 6.3% | 20.5% | 14.6% |
| No. of Awards | -6.8% | 5.8% | -19.2% | 1.7% | 18.3% | 18.3% | -1.2% | 13.3% | 14.9% | 5.1% |
| Average Awards | 79.0% | -2.8% | -24.4% | 14.7% | 0.6% | -5.9% | 12.8% | -6.1% | 4.9% | 6.5% |
| MARYLAND | | | | | | | | | | |
| Total Awards | -10.3% | 14.0% | 7.4% | 10.2% | 10.3% | -3.7% | 9.1% | -1.8% | 7.1% | 5.3% |
| No. of Awards | 3.4% | 4.3% | 0.5% | 1.6% | 4.1% | -3.2% | -0.4% | 2.7% | 5.2% | 2.1% |
| Average Awards | -13.3% | 9.3% | 6.9% | 8.5% | 5.9% | -0.5% | 9.5% | -4.4% | 1.8% | 2.6% |
| MASSACHUSETTS | | | | | | | | | | |
| Total Awards | 5.9% | 8.6% | 6.4% | 4.2% | 5.7% | 3.6% | 9.0% | 6.6% | 8.4% | 8.4% |
| No. of Awards | 2.0% | 4.0% | 1.0% | -0.1% | 3.9% | 0.9% | 7.0% | 4.1% | 4.4% | 3.4% |
| Average Awards | 3.8% | 4.4% | 5.3% | 4.3% | 1.7% | 2.7% | 1.9% | 2.4% | 3.9% | 3.9% |
| MICHIGAN | | | | | | | | | | |
| Total Awards | 7.6% | 11.9% | 11.2% | 3.9% | 6.4% | 0.4% | 5.0% | 6.7% | 7.6% | 8.8% |
| No. of Awards | 0.6% | 5.1% | 4.9% | -0.8% | 1.1% | -2.7% | -0.4% | 1.9% | 4.3% | 1.6% |
| Average Awards | 6.9% | 6.5% | 6.0% | 4.7% | 5.2% | 3.1% | 5.4% | 4.7% | 3.1% | 6.2% |
| MINNESOTA | | | | | | | | | | |
| Total Awards | 6.1% | 14.6% | 2.7% | 7.3% | 1.7% | 7.2% | 1.0% | 0.3% | 4.5% | 6.1% |
| No. of Awards | -1.3% | 8.0% | -0.4% | 0.7% | 1.1% | 1.7% | -1.0% | 2.2% | 5.5% | 1.9% |
| Average Awards | 7.5% | 6.1% | 3.1% | 6.6% | 0.7% | 5.4% | 2.0% | -1.9% | -0.9% | 3.5% |
| MISSISSIPPI | | | | | | | | | | |
| Total Awards | 3.9% | -8.2% | -9.5% | 44.2% | 5.4% | 1.7% | -8.4% | 16.4% | 8.1% | 6.0% |
| No. of Awards | 0.0% | -7.8% | -16.9% | 18.8% | 0.0% | -8.5% | -4.0% | 4.2% | 8.0% | -1.1% |
| Average Awards | 3.9% | -0.4% | 8.9% | 21.4% | 5.4% | 11.2% | -4.6% | 11.7% | 0.1% | 7.9% |
| MISSOURI | | | | | | | | | | |
| Total Awards | 14.9% | 5.4% | 1.7% | 3.3% | 9.1% | 6.3% | 7.4% | 6.3% | 11.0% | 9.7% |
| No. of Awards | 5.3% | -0.8% | -0.8% | -3.4% | 6.4% | 3.4% | 1.6% | 3.9% | 4.0% | 2.3% |
| Average Awards | 9.1% | 6.3% | 2.5% | 6.9% | 2.5% | 2.8% | 5.7% | 2.3% | 6.7% | 6.1% |
| MONTANA | | | | | | | | | | |
| Total Awards | 17.1% | -7.1% | 6.5% | -5.4% | 33.3% | -4.6% | 23.2% | 15.3% | -0.4% | 10.8% |
| No. of Awards | 5.3% | -5.0% | -2.6% | -13.5% | 18.8% | -7.9% | 5.7% | 13.5% | 2.4% | 1.5% |
| Average Awards | 11.3% | -2.2% | 9.3% | 9.3% | 12.2% | 3.6% | 16.6% | 1.6% | -2.7% | 8.2% |
| NEBRASKA | | | | | | | | | | |
| Total Awards | 16.7% | 5.7% | 11.8% | 6.8% | -4.0% | 12.0% | 3.0% | 3.4% | 6.6% | 8.8% |
| No. of Awards | -5.1% | 10.0% | 1.4% | 2.8% | -10.1% | 11.2% | -10.7% | 4.5% | 3.6% | 0.6% |
| Average Awards | 23.0% | -4.0% | 10.2% | 3.9% | 6.7% | 0.7% | 15.4% | -1.1% | 2.9% | 7.9% |
| NEVADA | | | | | | | | | | |
| Total Awards | -6.9% | 18.9% | 51.8% | -3.2% | 30.8% | -35.1% | 29.6% | 13.8% | 6.3% | 12.9% |
| No. of Awards | 3.2% | 15.6% | 29.7% | -10.4% | -9.3% | -17.9% | 6.3% | 14.7% | 5.1% | 3.6% |
| Average Awards | -9.8% | 2.9% | 17.0% | 8.0% | 44.2% | -20.9% | 22.0% | -0.8% | 1.1% | 7.1% |

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|---|---|---|---|---|---|---|---|---|---|---|
| NEW HAMPSHIRE | | | | | | | | | | |
| Total Awards | 29.2% | 14.2% | 14.5% | -7.3% | 2.4% | 6.4% | 10.8% | 2.3% | -8.3% | 8.6% |
| No. of Awards | 8.1% | 8.2% | 2.5% | -3.7% | -3.8% | 2.7% | 13.0% | 3.4% | -7.2% | 2.6% |
| Average Awards | 19.5% | 5.6% | 11.7% | -3.8% | 6.5% | 3.6% | -1.9% | -1.1% | -1.2% | 4.8% |
| NEW JERSEY | | | | | | | | | | |
| Total Awards | 13.9% | 4.3% | -0.4% | 7.6% | 2.4% | 8.0% | 3.1% | 5.6% | 7.8% | 7.2% |
| No. of Awards | 2.3% | 8.8% | -6.2% | 2.7% | 0.0% | -2.8% | 1.3% | 6.1% | 2.1% | 1.6% |
| Average Awards | 11.3% | -4.2% | 6.2% | 4.8% | 2.4% | 11.1% | 1.7% | -0.5% | 5.6% | 4.9% |
| NEW MEXICO | | | | | | | | | | |
| Total Awards | 8.0% | 19.2% | 8.0% | 4.2% | 22.2% | -4.6% | -0.8% | 21.4% | -0.3% | 11.4% |
| No. of Awards | 5.8% | 18.0% | -1.3% | 0.7% | 1.3% | -3.9% | -11.6% | 6.2% | 3.6% | 1.9% |
| Average Awards | 2.1% | 1.0% | 9.4% | 3.5% | 20.6% | -0.7% | 12.2% | 14.3% | -3.8% | 8.1% |
| NEW YORK | | | | | | | | | | |
| Total Awards | 3.1% | 6.5% | 6.0% | -1.3% | 4.4% | -0.4% | 3.1% | 6.1% | 8.2% | 4.6% |
| No. of Awards | -1.2% | 3.1% | -1.5% | -4.2% | 2.7% | -4.3% | 1.1% | 4.8% | 4.1% | 0.5% |
| Average Awards | 4.3% | 3.3% | 7.6% | 3.0% | 1.7% | 4.0% | 2.0% | 1.2% | 4.0% | 4.0% |
| NORTH CAROLINA | | | | | | | | | | |
| Total Awards | 1.7% | 14.4% | 7.1% | 9.4% | 7.6% | 4.8% | 5.7% | 4.4% | 3.8% | 8.5% |
| No. of Awards | 1.6% | 5.4% | 6.6% | 2.1% | 3.0% | -0.4% | 3.2% | 3.6% | -0.2% | 3.1% |
| Average Awards | 0.1% | 8.6% | 0.5% | 7.1% | 4.4% | 5.2% | 2.5% | 0.7% | 4.1% | 4.2% |
| NORTH DAKOTA | | | | | | | | | | |
| Total Awards | -37.4% | 47.8% | -0.6% | 3.9% | -14.6% | 83.6% | -6.3% | 5.9% | -30.9% | 0.3% |
| No. of Awards | -40.0% | -6.7% | 7.1% | 0.0% | 6.7% | 50.0% | -25.0% | 22.2% | -22.7% | -3.6% |
| Average Awards | 4.4% | 58.4% | -7.2% | 3.9% | -19.9% | 22.4% | 24.9% | -13.3% | -10.6% | 5.7% |
| OHIO | | | | | | | | | | |
| Total Awards | 5.4% | 12.9% | 8.2% | 0.4% | 11.4% | 5.1% | 4.7% | 11.4% | 10.5% | 10.6% |
| No. of Awards | -0.8% | 8.3% | 0.1% | -2.8% | 4.4% | 1.6% | 2.8% | 7.4% | 7.5% | 3.5% |
| Average Awards | 6.3% | 4.3% | 8.1% | 3.3% | 6.7% | 3.4% | 1.9% | 3.8% | 2.8% | 5.4% |
| OKLAHOMA | | | | | | | | | | |
| Total Awards | 3.3% | 18.5% | 10.3% | -0.1% | 9.0% | 13.5% | 16.2% | 0.1% | 13.0% | 13.3% |
| No. of Awards | -2.8% | 12.9% | -1.3% | -2.6% | 0.7% | 0.0% | 1.3% | -7.1% | -2.1% | -0.2% |
| Average Awards | 6.3% | 4.9% | 11.7% | 2.6% | 8.3% | 13.5% | 14.7% | 7.8% | 15.5% | 13.8% |
| OREGON | | | | | | | | | | |
| Total Awards | -0.1% | 9.4% | 13.2% | 0.9% | 12.1% | 3.6% | 2.4% | 14.6% | 12.4% | 10.1% |
| No. of Awards | 4.8% | 2.0% | 2.7% | -2.6% | 2.0% | 1.3% | 1.5% | 6.2% | 6.2% | 2.9% |
| Average Awards | -4.6% | 7.2% | 10.2% | 3.6% | 9.9% | 2.2% | 0.9% | 7.9% | 5.8% | 5.7% |
| PENNSYLVANIA | | | | | | | | | | |
| Total Awards | 6.1% | 14.0% | 10.7% | 1.9% | 3.8% | 8.6% | 4.5% | 10.5% | 7.9% | 10.2% |
| No. of Awards | 2.5% | 9.6% | 1.0% | -1.0% | 5.2% | 3.9% | 2.3% | 6.4% | 5.0% | 4.5% |
| Average Awards | 3.5% | 4.0% | 9.6% | 2.9% | -1.4% | 4.5% | 2.2% | 3.8% | 2.8% | 4.1% |

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|---|---|---|---|---|---|---|---|---|---|---|
| RHODE ISLAND | | | | | | | | | | |
| Total Awards | 7.8% | 9.5% | 6.5% | 0.1% | -2.0% | 6.8% | 5.4% | 22.8% | -2.4% | 7.4% |
| No. of Awards | -1.9% | 7.7% | -4.9% | -3.3% | 0.0% | -1.0% | 7.4% | 17.0% | -2.7% | 1.9% |
| Average Awards | 9.9% | 1.7% | 12.0% | 3.5% | -2.0% | 7.8% | -1.9% | 5.0% | 0.4% | 4.6% |
| SOUTH CAROLINA | | | | | | | | | | |
| Total Awards | 13.8% | 18.7% | -5.6% | -2.3% | 23.5% | -1.4% | 7.2% | 10.9% | 16.4% | 12.2% |
| No. of Awards | 6.1% | 6.9% | -8.6% | -8.2% | 12.7% | -3.4% | -2.9% | -0.6% | 17.6% | 2.0% |
| Average Awards | 7.3% | 11.1% | 3.2% | 6.4% | 9.5% | 2.0% | 10.4% | 11.5% | -1.0% | 8.7% |
| SOUTH DAKOTA | | | | | | | | | | |
| Total Awards | 8.3% | 43.3% | 35.7% | -11.1% | 21.4% | -15.7% | 5.6% | 59.1% | -4.7% | 23.0% |
| No. of Awards | 16.7% | 14.3% | -12.5% | -28.6% | 50.0% | -6.7% | -14.3% | 33.3% | 6.3% | 4.6% |
| Average Awards | -7.1% | 25.4% | 55.1% | 24.4% | -19.1% | -9.7% | 23.2% | 19.3% | -10.3% | 13.0% |
| TENNESSEE | | | | | | | | | | |
| Total Awards | 10.5% | 11.5% | 6.9% | 3.8% | 2.5% | 3.1% | 5.7% | 6.0% | 4.5% | 7.7% |
| No. of Awards | 7.4% | 7.4% | -0.3% | -2.2% | 2.9% | -2.0% | 3.4% | 4.6% | 4.1% | 3.1% |
| Average Awards | 2.8% | 3.8% | 7.2% | 6.1% | -0.4% | 5.3% | 2.3% | 1.3% | 0.3% | 3.6% |
| TEXAS | | | | | | | | | | |
| Total Awards | 3.5% | 12.8% | 9.7% | 7.2% | 11.1% | -1.0% | 10.0% | 3.1% | 8.0% | 9.5% |
| No. of Awards | -2.2% | 7.3% | 0.9% | 0.3% | 4.1% | -1.5% | -0.1% | 3.3% | 4.0% | 1.9% |
| Average Awards | 5.9% | 5.1% | 8.7% | 6.9% | 6.8% | 0.5% | 10.1% | -0.1% | 3.9% | 6.5% |
| UTAH | | | | | | | | | | |
| Total Awards | 3.9% | 12.9% | 8.3% | -4.8% | -0.3% | 19.4% | -6.8% | 15.0% | 0.8% | 6.2% |
| No. of Awards | 5.2% | 2.3% | 3.5% | -0.9% | -5.6% | 0.3% | 1.7% | 4.6% | 2.8% | 1.6% |
| Average Awards | -1.3% | 10.3% | 4.6% | -3.9% | 5.7% | 19.0% | -8.3% | 9.9% | -1.9% | 4.0% |
| VERMONT | | | | | | | | | | |
| Total Awards | 5.4% | 15.8% | -6.8% | -2.0% | -9.5% | -9.9% | 2.2% | -2.2% | 13.9% | 0.4% |
| No. of Awards | -2.7% | 4.8% | -8.5% | -0.7% | -10.1% | -7.2% | 2.6% | -15.1% | 19.8% | -2.1% |
| Average Awards | 8.3% | 10.5% | 1.9% | -1.3% | 0.6% | -2.9% | -0.4% | 15.3% | -4.9% | 3.2% |
| VIRGINIA | | | | | | | | | | |
| Total Awards | 129.2% | -11.5% | 13.7% | -7.9% | 6.1% | -28.3% | -5.6% | 0.7% | 6.8% | 7.1% |
| No. of Awards | 1.2% | 8.8% | -2.8% | 1.9% | -0.6% | 2.2% | 2.2% | -3.6% | 13.4% | 2.6% |
| Average Awards | 126.5% | -18.7% | 16.9% | -9.7% | 6.8% | -29.9% | -7.6% | 4.5% | -5.8% | 3.6% |
| WASHINGTON | | | | | | | | | | |
| Total Awards | 9.5% | 12.5% | 16.3% | -9.4% | 8.6% | 14.9% | -0.2% | 14.5% | 1.1% | 9.7% |
| No. of Awards | 4.4% | 11.0% | 0.0% | -5.5% | 7.7% | 3.7% | 5.3% | 5.1% | 1.2% | 4.1% |
| Average Awards | 4.9% | 1.3% | 16.3% | -4.1% | 0.8% | 10.8% | -5.2% | 8.9% | -0.1% | 4.1% |
| WEST VIRGINIA | | | | | | | | | | |
| Total Awards | -12.7% | 12.7% | 17.2% | 22.9% | -15.2% | -1.7% | -7.4% | 3.7% | 26.5% | 4.8% |
| No. of Awards | -3.5% | -3.6% | 3.8% | 3.6% | -5.3% | -20.4% | 4.7% | 2.2% | 2.2% | -1.9% |
| Average Awards | -9.5% | 17.0% | 12.9% | 18.6% | -10.5% | 23.4% | -11.5% | 1.4% | 23.8% | 8.2% |

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|---|---|---|---|---|---|---|---|---|---|---|
| WISCONSIN | | | | | | | | | | |
| Total Awards | 2.7% | 7.3% | 9.0% | 5.5% | 5.9% | 4.9% | 1.9% | 4.4% | 6.6% | 6.6% |
| No. of Awards | 1.4% | -0.4% | 0.8% | -3.2% | 3.5% | 1.1% | 2.8% | 2.4% | 3.1% | 1.3% |
| Average Awards | 1.2% | 7.7% | 8.1% | 9.0% | 2.3% | 3.7% | -0.8% | 2.0% | 3.3% | 4.7% |
| WYOMING | | | | | | | | | | |
| Total Awards | -9.1% | 31.9% | 10.7% | -22.5% | -46.6% | 21.7% | 17.3% | 21.9% | 63.8% | 6.3% |
| No. of Awards | -18.8% | 15.4% | -6.7% | -21.4% | -36.4% | 0.0% | 14.3% | 0.0% | 62.5% | -2.1% |
| Average Awards | 11.8% | 14.3% | 18.6% | -1.3% | -16.0% | 21.7% | 2.6% | 21.9% | 0.8% | 10.3% |
| U. S. TOTAL | | | | | | | | | | |
| Total Awards | 6.8% | 8.8% | 7.9% | 2.9% | 6.7% | 3.4% | 5.0% | 6.4% | 7.0% | 7.8% |
| No. of Awards | 1.0% | 5.2% | 0.0% | -1.0% | 3.0% | -0.7% | 1.9% | 4.0% | 4.2% | 2.1% |
| Average Awards | 5.8% | 3.3% | 7.9% | 4.0% | 3.6% | 4.1% | 3.0% | 2.2% | 2.7% | 4.8% |

SOURCE: Data provided by the Office of Reports and Analysis, Office of Extramural Research, National Institutes of Health, Bethesda, MD, August 1999.

APPENDIX C - 3
STATE SHARES OF TOTAL NIH AWARDS TO ALL INSTITUTIONS IN ALL STATES
Total Awards and No. of Awards
1989 to 1998

| State | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ALABAMA | | | | | | | | | | | |
| Total Awards | 1.5% | 1.4% | 1.4% | 1.4% | 1.4% | 1.5% | 1.5% | 1.6% | 1.5% | 1.5% | 1.5% |
| No. of Awards | 1.5% | 1.4% | 1.4% | 1.4% | 1.4% | 1.5% | 1.5% | 1.5% | 1.5% | 1.4% | 1.4% |
| ALASKA | | | | | | | | | | | |
| Total Awards | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| No. of Awards | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| ARIZONA | | | | | | | | | | | |
| Total Awards | 0.8% | 0.8% | 0.8% | 0.8% | 0.8% | 0.8% | 0.8% | 0.7% | 0.7% | 0.8% | 0.8% |
| No. of Awards | 0.8% | 0.9% | 1.0% | 0.9% | 0.9% | 0.8% | 0.8% | 0.8% | 0.8% | 0.9% | 0.9% |
| ARKANSAS | | | | | | | | | | | |
| Total Awards | 0.1% | 0.1% | 0.2% | 0.2% | 0.2% | 0.2% | 0.2% | 0.2% | 0.2% | 0.2% | 0.2% |
| No. of Awards | 0.3% | 0.3% | 0.3% | 0.3% | 0.3% | 0.3% | 0.3% | 0.3% | 0.3% | 0.3% | 0.3% |
| CALIFORNIA | | | | | | | | | | | |
| Total Awards | 14.8% | 14.7% | 14.0% | 14.2% | 14.1% | 13.9% | 15.2% | 15.1% | 15.2% | 15.0% | 14.6% |
| No. of Awards | 13.8% | 14.0% | 13.7% | 13.6% | 13.6% | 13.6% | 13.8% | 13.7% | 13.5% | 13.5% | 13.7% |
| COLORADO | | | | | | | | | | | |
| Total Awards | 1.5% | 1.5% | 1.5% | 1.6% | 1.7% | 1.8% | 1.7% | 1.7% | 1.8% | 1.7% | 1.7% |
| No. of Awards | 1.8% | 1.9% | 1.8% | 1.8% | 1.9% | 2.0% | 1.9% | 1.9% | 2.0% | 2.0% | 1.9% |
| CONNECTICUT | | | | | | | | | | | |
| Total Awards | 2.7% | 2.6% | 2.5% | 2.6% | 2.5% | 2.4% | 2.4% | 2.4% | 2.4% | 2.3% | 2.5% |
| No. of Awards | 2.5% | 2.4% | 2.4% | 2.4% | 2.4% | 2.4% | 2.4% | 2.4% | 2.3% | 2.2% | 2.4% |
| DELAWARE | | | | | | | | | | | |
| Total Awards | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% |
| No. of Awards | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% |
| DIST. OF COLUMBIA | | | | | | | | | | | |
| Total Awards | 1.3% | 1.3% | 1.4% | 1.4% | 1.5% | 1.6% | 1.6% | 1.4% | 1.3% | 1.3% | 1.4% |
| No. of Awards | 1.1% | 1.1% | 1.2% | 1.1% | 1.2% | 1.2% | 1.1% | 1.1% | 1.1% | 1.0% | 1.1% |
| FLORIDA | | | | | | | | | | | |
| Total Awards | 1.5% | 1.5% | 1.5% | 1.4% | 1.5% | 1.5% | 1.4% | 1.4% | 1.4% | 1.4% | 1.5% |
| No. of Awards | 1.9% | 1.8% | 1.8% | 1.7% | 1.8% | 1.7% | 1.6% | 1.6% | 1.6% | 1.6% | 1.7% |

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|---|---|---|---|---|---|---|---|---|---|---|---|
| GEORGIA | | | | | | | | | | | |
| Total Awards | 1.3% | 1.3% | 1.3% | 1.3% | 1.4% | 1.4% | 1.3% | 1.3% | 1.4% | 1.5% | 1.4% |
| No. of Awards | 1.5% | 1.5% | 1.5% | 1.5% | 1.7% | 1.6% | 1.6% | 1.6% | 1.6% | 1.7% | 1.6% |
| HAWAII | | | | | | | | | | | |
| Total Awards | 0.2% | 0.2% | 0.2% | 0.2% | 0.2% | 0.3% | 0.2% | 0.2% | 0.2% | 0.2% | 0.2% |
| No. of Awards | 0.2% | 0.2% | 0.2% | 0.2% | 0.2% | 0.2% | 0.1% | 0.1% | 0.1% | 0.1% | 0.2% |
| IDAHO | | | | | | | | | | | |
| Total Awards | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| No. of Awards | 0.1% | 0.1% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| ILLINOIS | | | | | | | | | | | |
| Total Awards | 3.2% | 3.1% | 3.0% | 3.0% | 2.9% | 3.0% | 3.0% | 3.1% | 3.1% | 3.1% | 3.1% |
| No. of Awards | 3.9% | 3.8% | 3.7% | 3.7% | 3.5% | 3.5% | 3.6% | 3.6% | 3.5% | 3.6% | 3.6% |
| INDIANA | | | | | | | | | | | |
| Total Awards | 1.0% | 1.0% | 1.0% | 1.0% | 1.0% | 1.0% | 1.0% | 1.0% | 1.0% | 1.0% | 1.0% |
| No. of Awards | 1.2% | 1.2% | 1.3% | 1.3% | 1.3% | 1.3% | 1.2% | 1.2% | 1.2% | 1.2% | 1.2% |
| IOWA | | | | | | | | | | | |
| Total Awards | 1.0% | 1.0% | 1.0% | 1.0% | 1.0% | 0.9% | 1.0% | 0.9% | 0.9% | 1.0% | 1.0% |
| No. of Awards | 1.2% | 1.1% | 1.1% | 1.1% | 1.1% | 1.0% | 0.9% | 0.9% | 1.0% | 1.0% | 1.0% |
| KANSAS | | | | | | | | | | | |
| Total Awards | 0.3% | 0.3% | 0.4% | 0.3% | 0.4% | 0.3% | 0.4% | 0.4% | 0.3% | 0.4% | 0.4% |
| No. of Awards | 0.5% | 0.5% | 0.5% | 0.5% | 0.5% | 0.5% | 0.5% | 0.5% | 0.4% | 0.5% | 0.5% |
| KENTUCKY | | | | | | | | | | | |
| Total Awards | 0.4% | 0.3% | 0.4% | 0.4% | 0.4% | 0.4% | 0.4% | 0.4% | 0.5% | 0.4% | 0.4% |
| No. of Awards | 0.5% | 0.5% | 0.6% | 0.7% | 0.7% | 0.6% | 0.6% | 0.7% | 0.7% | 0.7% | 0.6% |
| LOUISIANA | | | | | | | | | | | |
| Total Awards | 0.7% | 0.7% | 0.8% | 0.7% | 0.7% | 0.7% | 0.6% | 0.6% | 0.6% | 0.6% | 0.7% |
| No. of Awards | 0.8% | 0.8% | 0.8% | 0.7% | 0.7% | 0.7% | 0.7% | 0.7% | 0.8% | 0.7% | 0.7% |
| MAINE | | | | | | | | | | | |
| Total Awards | 0.2% | 0.3% | 0.3% | 0.2% | 0.2% | 0.2% | 0.2% | 0.2% | 0.2% | 0.3% | 0.2% |
| No. of Awards | 0.2% | 0.2% | 0.2% | 0.2% | 0.2% | 0.2% | 0.2% | 0.2% | 0.2% | 0.3% | 0.2% |
| MARYLAND | | | | | | | | | | | |
| Total Awards | 7.1% | 5.9% | 6.2% | 6.2% | 6.6% | 6.9% | 6.4% | 6.6% | 6.1% | 6.1% | 6.4% |
| No. of Awards | 4.6% | 4.7% | 4.7% | 4.7% | 4.8% | 4.9% | 4.8% | 4.7% | 4.6% | 4.6% | 4.7% |
| MASSACHUSETTS | | | | | | | | | | | |
| Total Awards | 10.2% | 10.1% | 10.1% | 10.0% | 10.1% | 10.0% | 10.0% | 10.4% | 10.4% | 10.6% | 10.2% |
| No. of Awards | 9.2% | 9.3% | 9.2% | 9.3% | 9.4% | 9.5% | 9.7% | 10.1% | 10.1% | 10.2% | 9.6% |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MICHIGAN | | | | | | | | | | | |
| Total Awards | 2.8% | 2.8% | 2.9% | 2.9% | 3.0% | 3.0% | 2.9% | 2.9% | 2.9% | 2.9% | 2.9% |
| No. of Awards | 3.1% | 3.1% | 3.1% | 3.3% | 3.3% | 3.2% | 3.1% | 3.1% | 3.0% | 3.0% | 3.1% |
| MINNESOTA | | | | | | | | | | | |
| Total Awards | 2.1% | 2.1% | 2.2% | 2.1% | 2.2% | 2.1% | 2.2% | 2.1% | 2.0% | 1.9% | 2.1% |
| No. of Awards | 2.1% | 2.1% | 2.1% | 2.1% | 2.2% | 2.1% | 2.2% | 2.1% | 2.1% | 2.1% | 2.1% |
| MISSISSIPPI | | | | | | | | | | | |
| Total Awards | 0.2% | 0.2% | 0.1% | 0.1% | 0.2% | 0.2% | 0.2% | 0.1% | 0.1% | 0.1% | 0.1% |
| No. of Awards | 0.3% | 0.3% | 0.2% | 0.2% | 0.2% | 0.2% | 0.2% | 0.2% | 0.2% | 0.2% | 0.2% |
| MISSOURI | | | | | | | | | | | |
| Total Awards | 2.2% | 2.4% | 2.3% | 2.2% | 2.2% | 2.3% | 2.3% | 2.4% | 2.4% | 2.5% | 2.3% |
| No. of Awards | 2.4% | 2.5% | 2.4% | 2.3% | 2.3% | 2.4% | 2.5% | 2.4% | 2.4% | 2.4% | 2.4% |
| MONTANA | | | | | | | | | | | |
| Total Awards | 0.1% | 0.1% | 0.1% | 0.0% | 0.0% | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% |
| No. of Awards | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% |
| NEBRASKA | | | | | | | | | | | |
| Total Awards | 0.3% | 0.3% | 0.3% | 0.3% | 0.3% | 0.3% | 0.3% | 0.3% | 0.3% | 0.3% | 0.3% |
| No. of Awards | 0.4% | 0.4% | 0.4% | 0.4% | 0.4% | 0.4% | 0.4% | 0.4% | 0.4% | 0.4% | 0.4% |
| NEVADA | | | | | | | | | | | |
| Total Awards | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% |
| No. of Awards | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% |
| NEW HAMPSHIRE | | | | | | | | | | | |
| Total Awards | 0.3% | 0.4% | 0.4% | 0.4% | 0.4% | 0.4% | 0.4% | 0.4% | 0.4% | 0.3% | 0.4% |
| No. of Awards | 0.4% | 0.4% | 0.4% | 0.5% | 0.4% | 0.4% | 0.4% | 0.5% | 0.5% | 0.4% | 0.4% |
| NEW JERSEY | | | | | | | | | | | |
| Total Awards | 1.2% | 1.2% | 1.2% | 1.1% | 1.1% | 1.1% | 1.1% | 1.1% | 1.1% | 1.1% | 1.1% |
| No. of Awards | 1.3% | 1.3% | 1.4% | 1.3% | 1.3% | 1.3% | 1.3% | 1.3% | 1.3% | 1.3% | 1.3% |
| NEW MEXICO | | | | | | | | | | | |
| Total Awards | 0.3% | 0.3% | 0.3% | 0.3% | 0.4% | 0.4% | 0.4% | 0.4% | 0.4% | 0.4% | 0.4% |
| No. of Awards | 0.4% | 0.4% | 0.4% | 0.4% | 0.4% | 0.4% | 0.4% | 0.4% | 0.4% | 0.4% | 0.4% |
| NEW YORK | | | | | | | | | | | |
| Total Awards | 12.2% | 11.8% | 11.6% | 11.4% | 10.9% | 10.7% | 10.3% | 10.1% | 10.1% | 10.2% | 10.8% |
| No. of Awards | 11.2% | 11.0% | 10.8% | 10.6% | 10.3% | 10.2% | 9.9% | 9.8% | 9.9% | 9.8% | 10.3% |
| NORTH CAROLINA | | | | | | | | | | | |
| Total Awards | 3.8% | 3.6% | 3.8% | 3.8% | 4.0% | 4.1% | 4.1% | 4.2% | 4.1% | 4.0% | 4.0% |
| No. of Awards | 3.5% | 3.5% | 3.5% | 3.8% | 3.9% | 3.9% | 3.9% | 3.9% | 3.9% | 3.8% | 3.8% |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| NORTH DAKOTA | | | | | | | | | | | |
| Total Awards | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| No. of Awards | 0.1% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.1% | 0.0% | 0.1% | 0.0% | 0.1% |
| OHIO | | | | | | | | | | | |
| Total Awards | 2.7% | 2.6% | 2.7% | 2.7% | 2.7% | 2.8% | 2.8% | 2.8% | 3.0% | 3.1% | 2.8% |
| No. of Awards | 3.0% | 3.0% | 3.0% | 3.1% | 3.0% | 3.0% | 3.1% | 3.1% | 3.2% | 3.3% | 3.1% |
| OKLAHOMA | | | | | | | | | | | |
| Total Awards | 0.2% | 0.2% | 0.3% | 0.3% | 0.3% | 0.3% | 0.3% | 0.3% | 0.3% | 0.3% | 0.3% |
| No. of Awards | 0.4% | 0.4% | 0.4% | 0.4% | 0.4% | 0.4% | 0.4% | 0.4% | 0.4% | 0.4% | 0.4% |
| OREGON | | | | | | | | | | | |
| Total Awards | 1.1% | 1.0% | 1.0% | 1.1% | 1.0% | 1.1% | 1.1% | 1.1% | 1.1% | 1.2% | 1.1% |
| No. of Awards | 1.3% | 1.3% | 1.3% | 1.3% | 1.3% | 1.3% | 1.3% | 1.3% | 1.3% | 1.3% | 1.3% |
| PENNSYLVANIA | | | | | | | | | | | |
| Total Awards | 5.9% | 5.8% | 6.1% | 6.3% | 6.2% | 6.0% | 6.3% | 6.3% | 6.6% | 6.6% | 6.3% |
| No. of Awards | 5.8% | 5.9% | 6.2% | 6.2% | 6.2% | 6.4% | 6.6% | 6.7% | 6.8% | 6.9% | 6.4% |
| RHODE ISLAND | | | | | | | | | | | |
| Total Awards | 0.5% | 0.5% | 0.5% | 0.5% | 0.5% | 0.4% | 0.4% | 0.4% | 0.5% | 0.5% | 0.5% |
| No. of Awards | 0.6% | 0.6% | 0.6% | 0.6% | 0.6% | 0.6% | 0.6% | 0.6% | 0.7% | 0.6% | 0.6% |
| SOUTH CAROLINA | | | | | | | | | | | |
| Total Awards | 0.3% | 0.4% | 0.4% | 0.3% | 0.3% | 0.4% | 0.4% | 0.4% | 0.4% | 0.4% | 0.4% |
| No. of Awards | 0.5% | 0.5% | 0.5% | 0.5% | 0.5% | 0.5% | 0.5% | 0.5% | 0.4% | 0.5% | 0.5% |
| SOUTH DAKOTA | | | | | | | | | | | |
| Total Awards | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| No. of Awards | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| TENNESSEE | | | | | | | | | | | |
| Total Awards | 1.6% | 1.6% | 1.7% | 1.7% | 1.7% | 1.6% | 1.6% | 1.6% | 1.6% | 1.6% | 1.6% |
| No. of Awards | 1.7% | 1.8% | 1.8% | 1.8% | 1.8% | 1.8% | 1.8% | 1.8% | 1.8% | 1.8% | 1.8% |
| TEXAS | | | | | | | | | | | |
| Total Awards | 4.6% | 4.4% | 4.6% | 4.7% | 4.9% | 5.1% | 4.8% | 5.1% | 4.9% | 5.0% | 4.8% |
| No. of Awards | 5.3% | 5.2% | 5.3% | 5.3% | 5.4% | 5.5% | 5.4% | 5.3% | 5.3% | 5.3% | 5.3% |
| UTAH | | | | | | | | | | | |
| Total Awards | 0.8% | 0.7% | 0.8% | 0.8% | 0.7% | 0.7% | 0.8% | 0.7% | 0.7% | 0.7% | 0.7% |
| No. of Awards | 0.9% | 0.9% | 0.9% | 0.9% | 0.9% | 0.8% | 0.8% | 0.8% | 0.9% | 0.8% | 0.9% |
| VERMONT | | | | | | | | | | | |
| Total Awards | 0.4% | 0.4% | 0.5% | 0.4% | 0.4% | 0.3% | 0.3% | 0.3% | 0.3% | 0.3% | 0.3% |
| No. of Awards | 0.5% | 0.4% | 0.4% | 0.4% | 0.4% | 0.3% | 0.3% | 0.3% | 0.3% | 0.3% | 0.4% |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VIRGINIA | | | | | | | | | | | |
| Total Awards | 1.6% | 3.5% | 2.8% | 3.0% | 2.7% | 2.6% | 1.8% | 1.7% | 1.6% | 1.6% | 2.2% |
| No. of Awards | 1.8% | 1.8% | 1.8% | 1.8% | 1.8% | 1.8% | 1.8% | 1.8% | 1.7% | 1.8% | 1.8% |
| WASHINGTON | | | | | | | | | | | |
| Total Awards | 3.2% | 3.3% | 3.4% | 3.7% | 3.3% | 3.3% | 3.7% | 3.5% | 3.8% | 3.6% | 3.5% |
| No. of Awards | 2.7% | 2.8% | 2.9% | 2.9% | 2.8% | 2.9% | 3.1% | 3.2% | 3.2% | 3.1% | 3.0% |
| WEST VIRGINIA | | | | | | | | | | | |
| Total Awards | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% |
| No. of Awards | 0.2% | 0.2% | 0.2% | 0.2% | 0.2% | 0.2% | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% |
| WISCONSIN | | | | | | | | | | | |
| Total Awards | 1.8% | 1.8% | 1.7% | 1.8% | 1.8% | 1.8% | 1.8% | 1.8% | 1.7% | 1.7% | 1.8% |
| No. of Awards | 2.1% | 2.1% | 2.0% | 2.0% | 2.0% | 2.0% | 2.0% | 2.1% | 2.0% | 2.0% | 2.0% |
| WYOMING | | | | | | | | | | | |
| Total Awards | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| No. of Awards | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| U. S. TOTAL | | | | | | | | | | | |
| Total Awards | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |
| No. of Awards | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |

SOURCE: Data provided by the Office of Reports and Analysis, Office of Extramural Research, National Institutes of Health, Bethesda, MD, August 1999.

APPENDIX D - 1

TOTAL NIH AWARDS TO MEDICAL SCHOOLS IN ALL STATES*

Total Awards, No. of Awards and Average Awards

1989 to 1998

| State | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 10-Year Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ALABAMA | | | | | | | | | | | |
| Total Awards | $40,316,110 | $42,480,392 | $51,562,219 | $54,782,569 | $57,347,279 | $62,953,351 | $67,441,365 | $75,640,822 | $79,959,138 | $89,577,142 | $622,060,387 |
| No. of Awards | 167 | 168 | 200 | 203 | 221 | 233 | 249 | 259 | 269 | 278 | 2,247 |
| Average Awards | $241,414 | $252,859 | $257,811 | $269,865 | $259,490 | $270,186 | $270,849 | $292,050 | $297,246 | $322,220 | $276,840 |
| ARIZONA | | | | | | | | | | | |
| Total Awards | $25,553,272 | $29,541,287 | $31,596,224 | $32,416,571 | $34,244,393 | $31,992,899 | $34,259,860 | $30,954,680 | $31,633,067 | $36,642,780 | $318,835,033 |
| No. of Awards | 102 | 114 | 127 | 127 | 112 | 114 | 111 | 103 | 111 | 116 | 1,137 |
| Average Awards | $250,522 | $259,134 | $248,789 | $255,249 | $305,754 | $280,639 | $308,647 | $300,531 | $284,983 | $315,886 | $280,418 |
| ARKANSAS | | | | | | | | | | | |
| Total Awards | $6,292,436 | $6,633,416 | $9,315,860 | $9,456,402 | $9,636,816 | $12,428,706 | $13,901,299 | $16,610,022 | $15,663,324 | $19,981,344 | $119,919,625 |
| No. of Awards | 64 | 62 | 77 | 64 | 65 | 73 | 79 | 84 | 74 | 89 | 731 |
| Average Awards | $98,319 | $106,991 | $120,985 | $147,756 | $148,259 | $170,256 | $175,966 | $197,738 | $211,667 | $224,509 | $164,049 |
| CALIFORNIA | | | | | | | | | | | |
| Total Awards | $469,705,822 | $508,657,315 | $501,842,131 | $553,440,259 | $570,927,456 | $595,993,271 | $600,505,488 | $625,538,805 | $645,924,018 | $706,146,202 | $5,778,680,767 |
| No. of Awards | 2,074 | 2,110 | 2,110 | 2,126 | 2,059 | 2,111 | 2,113 | 2,140 | 2,159 | 2,234 | 21,236 |
| Average Awards | $226,473 | $241,070 | $237,840 | $260,320 | $277,284 | $282,327 | $284,196 | $292,308 | $299,177 | $316,091 | $272,117 |
| COLORADO | | | | | | | | | | | |
| Total Awards | $42,208,502 | $46,905,780 | $54,833,027 | $59,539,552 | $65,550,611 | $76,083,022 | $77,648,113 | $80,089,073 | $86,549,524 | $95,044,471 | $684,451,675 |
| No. of Awards | 233 | 252 | 253 | 265 | 262 | 313 | 292 | 290 | 301 | 319 | 2,780 |
| Average Awards | $181,152 | $186,134 | $216,731 | $224,678 | $250,193 | $243,077 | $265,918 | $276,169 | $287,540 | $297,945 | $246,206 |
| CONNECTICUT | | | | | | | | | | | |
| Total Awards | $123,003,186 | $124,023,266 | $136,699,431 | $149,817,045 | $148,994,119 | $158,832,682 | $158,818,279 | $172,775,884 | $185,438,583 | $192,640,399 | $1,551,042,874 |
| No. of Awards | 537 | 526 | 562 | 576 | 589 | 619 | 591 | 618 | 643 | 655 | 5,916 |
| Average Awards | $229,056 | $235,786 | $243,237 | $260,099 | $252,961 | $256,596 | $268,728 | $279,573 | $288,396 | $294,107 | $262,178 |
| DIST. OF COLUMBIA | | | | | | | | | | | |
| Total Awards | $24,231,498 | $27,328,570 | $31,734,393 | $35,264,926 | $37,382,544 | $44,472,677 | $39,619,163 | $40,334,504 | $44,684,715 | $50,054,549 | $375,107,539 |
| No. of Awards | 126 | 128 | 146 | 147 | 147 | 155 | 151 | 154 | 157 | 156 | 1,467 |
| Average Awards | $192,313 | $213,504 | $217,359 | $239,897 | $254,303 | $286,920 | $262,379 | $261,912 | $284,616 | $320,862 | $255,697 |
| FLORIDA | | | | | | | | | | | |
| Total Awards | $70,062,588 | $72,423,332 | $76,969,852 | $80,892,198 | $85,021,622 | $94,160,772 | $83,570,974 | $83,889,820 | $90,372,841 | $97,852,470 | $835,216,469 |
| No. of Awards | 372 | 355 | 370 | 364 | 374 | 363 | 343 | 344 | 359 | 367 | 3,611 |
| Average Awards | $188,340 | $204,009 | $208,027 | $222,231 | $227,331 | $259,396 | $243,647 | $243,866 | $251,735 | $266,628 | $231,298 |
| GEORGIA | | | | | | | | | | | |
| Total Awards | $41,493,131 | $45,545,130 | $52,578,638 | $61,320,822 | $68,839,483 | $73,051,136 | $73,182,057 | $75,067,078 | $88,090,324 | $104,553,504 | $683,721,303 |
| No. of Awards | 252 | 252 | 276 | 302 | 322 | 334 | 327 | 340 | 373 | 416 | 3,194 |
| Average Awards | $164,655 | $180,735 | $190,502 | $203,049 | $213,787 | $218,716 | $223,798 | $220,786 | $236,167 | $251,331 | $214,064 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| HAWAII | | | | | | | | | | | |
| Total Awards | $911,344 | $1,713,866 | $2,111,499 | $2,339,812 | $2,253,545 | $2,263,923 | $1,796,233 | $2,355,834 | $2,725,181 | $2,163,550 | $20,634,787 |
| No. of Awards | 12 | 13 | 13 | 12 | 9 | 9 | 7 | 8 | 9 | 7 | 99 |
| Average Awards | $75,945 | $131,836 | $162,423 | $194,984 | $250,394 | $251,547 | $256,605 | $294,479 | $302,798 | $309,079 | $208,432 |
| ILLINOIS | | | | | | | | | | | |
| Total Awards | $106,903,169 | $107,996,232 | $117,138,093 | $124,151,345 | $129,829,132 | $135,679,349 | $149,968,796 | $163,358,942 | $165,881,111 | $178,398,821 | $1,379,304,990 |
| No. of Awards | 552 | 540 | 585 | 594 | 577 | 595 | 614 | 644 | 652 | 693 | 6,046 |
| Average Awards | $193,665 | $199,993 | $200,236 | $209,009 | $225,007 | $228,033 | $244,249 | $253,663 | $254,419 | $257,430 | $228,135 |
| INDIANA | | | | | | | | | | | |
| Total Awards | $26,580,290 | $27,720,019 | $33,104,982 | $38,149,835 | $40,825,864 | $43,342,688 | $47,098,546 | $50,057,363 | $55,832,734 | $62,642,633 | $425,354,954 |
| No. of Awards | 131 | 136 | 149 | 167 | 167 | 167 | 164 | 178 | 193 | 206 | 1,658 |
| Average Awards | $202,903 | $203,824 | $222,181 | $228,442 | $244,466 | $259,537 | $287,186 | $281,221 | $289,289 | $304,090 | $256,547 |
| IOWA | | | | | | | | | | | |
| Total Awards | $51,444,134 | $54,719,837 | $56,537,052 | $60,401,010 | $64,135,259 | $63,721,308 | $64,991,085 | $65,079,314 | $68,047,998 | $73,701,989 | $622,778,986 |
| No. of Awards | 279 | 250 | 246 | 245 | 248 | 227 | 227 | 233 | 255 | 289 | 2,499 |
| Average Awards | $184,388 | $218,879 | $229,825 | $246,535 | $258,610 | $280,711 | $286,304 | $279,310 | $266,855 | $255,024 | $249,211 |
| KANSAS | | | | | | | | | | | |
| Total Awards | $8,892,979 | $10,937,002 | $12,796,627 | $13,659,536 | $16,232,801 | $16,570,661 | $18,006,507 | $16,682,003 | $14,853,965 | $20,103,766 | $148,735,847 |
| No. of Awards | 77 | 84 | 87 | 79 | 87 | 85 | 82 | 76 | 71 | 80 | 808 |
| Average Awards | $115,493 | $130,202 | $147,088 | $172,906 | $186,584 | $194,949 | $219,592 | $219,500 | $209,211 | $251,297 | $184,079 |
| KENTUCKY | | | | | | | | | | | |
| Total Awards | $15,099,161 | $15,053,289 | $18,194,885 | $23,114,991 | $24,881,478 | $27,466,354 | $28,890,058 | $33,698,521 | $36,427,789 | $37,651,652 | $260,478,178 |
| No. of Awards | 105 | 105 | 122 | 141 | 149 | 162 | 162 | 186 | 191 | 195 | 1,518 |
| Average Awards | $143,802 | $143,365 | $149,138 | $163,936 | $166,990 | $169,545 | $178,334 | $181,175 | $190,721 | $193,085 | $171,593 |
| LOUISIANA | | | | | | | | | | | |
| Total Awards | $24,275,539 | $23,972,931 | $29,279,935 | $30,945,574 | $25,795,670 | $29,656,521 | $27,559,563 | $31,654,066 | $32,263,677 | $33,771,057 | $289,174,533 |
| No. of Awards | 145 | 136 | 143 | 139 | 122 | 154 | 143 | 166 | 172 | 168 | 1,488 |
| Average Awards | $167,418 | $176,272 | $204,755 | $222,630 | $211,440 | $192,575 | $192,724 | $190,687 | $187,580 | $201,018 | $194,338 |
| MARYLAND | | | | | | | | | | | |
| Total Awards | $164,139,750 | $179,565,550 | $194,971,036 | $223,888,184 | $230,473,458 | $240,877,821 | $241,029,189 | $256,573,685 | $263,916,016 | $290,643,049 | $2,286,077,738 |
| No. of Awards | 735 | 776 | 804 | 858 | 855 | 889 | 871 | 917 | 914 | 956 | 8,575 |
| Average Awards | $223,319 | $231,399 | $242,501 | $260,942 | $269,560 | $270,954 | $276,727 | $279,797 | $288,748 | $304,020 | $266,598 |
| MASSACHUSETTS | | | | | | | | | | | |
| Total Awards | $148,533,999 | $150,648,621 | $170,783,112 | $178,295,267 | $175,897,616 | $193,395,781 | $196,003,136 | $212,385,891 | $227,832,144 | $244,691,276 | $1,898,466,843 |
| No. of Awards | 679 | 685 | 729 | 717 | 695 | 724 | 732 | 758 | 801 | 817 | 7,337 |
| Average Awards | $218,754 | $219,925 | $234,270 | $248,668 | $253,090 | $267,121 | $267,764 | $280,192 | $284,435 | $299,500 | $258,752 |
| MICHIGAN | | | | | | | | | | | |
| Total Awards | $105,758,954 | $112,368,218 | $125,544,340 | $135,148,899 | $137,621,351 | $167,634,485 | $169,643,342 | $176,106,527 | $190,556,014 | $201,993,303 | $1,522,375,433 |
| No. of Awards | 569 | 587 | 606 | 641 | 622 | 700 | 691 | 699 | 712 | 721 | 6,548 |
| Average Awards | $185,868 | $191,428 | $207,169 | $210,841 | $221,256 | $239,478 | $245,504 | $251,941 | $267,635 | $280,157 | $232,495 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MINNESOTA | | | | | | | | | | | |
| Total Awards | $59,261,370 | $60,869,270 | $63,190,480 | $60,947,632 | $65,318,477 | $69,880,054 | $80,256,378 | $83,863,495 | $78,164,201 | $78,656,967 | $700,408,324 |
| No. of Awards | 297 | 304 | 315 | 314 | 305 | 308 | 321 | 320 | 305 | 306 | 3,095 |
| Average Awards | $199,533 | $200,228 | $200,605 | $194,101 | $214,159 | $226,883 | $250,020 | $262,073 | $256,276 | $257,049 | $226,303 |
| MISSISSIPPI | | | | | | | | | | | |
| Total Awards | $6,683,953 | $6,880,866 | $6,443,286 | $5,470,951 | $7,194,497 | $7,267,587 | $6,863,878 | $7,089,144 | $7,739,968 | $6,914,285 | $68,548,415 |
| No. of Awards | 53 | 52 | 47 | 36 | 38 | 38 | 39 | 40 | 42 | 39 | 424 |
| Average Awards | $126,112 | $132,324 | $137,091 | $151,971 | $189,329 | $191,252 | $175,997 | $177,229 | $184,285 | $177,289 | $161,671 |
| MISSOURI | | | | | | | | | | | |
| Total Awards | $113,928,136 | $133,584,464 | $140,359,059 | $145,056,647 | $153,000,998 | $166,463,889 | $181,521,882 | $191,421,249 | $198,593,562 | $221,512,246 | $1,645,442,132 |
| No. of Awards | 587 | 622 | 609 | 610 | 610 | 654 | 719 | 711 | 713 | 729 | 6,564 |
| Average Awards | $194,085 | $214,766 | $230,475 | $237,798 | $250,821 | $254,532 | $252,464 | $269,228 | $278,532 | $303,858 | $250,677 |
| NEBRASKA | | | | | | | | | | | |
| Total Awards | $11,027,529 | $11,970,473 | $11,376,373 | $13,349,197 | $14,792,998 | $14,092,854 | $16,048,391 | $16,507,734 | $16,814,350 | $18,256,429 | $144,236,328 |
| No. of Awards | 85 | 84 | 81 | 81 | 90 | 84 | 95 | 82 | 82 | 87 | 851 |
| Average Awards | $129,736 | $142,506 | $140,449 | $164,805 | $164,367 | $167,772 | $168,930 | $201,314 | $205,053 | $209,844 | $169,490 |
| NEVADA | | | | | | | | | | | |
| Total Awards | $3,459,148 | $3,373,763 | $3,898,791 | $5,547,787 | $4,897,809 | $7,132,154 | $3,793,475 | $5,423,892 | $5,919,756 | $6,639,652 | $50,086,227 |
| No. of Awards | 23 | 25 | 29 | 36 | 27 | 25 | 18 | 20 | 24 | 28 | 255 |
| Average Awards | $150,398 | $134,951 | $134,441 | $154,105 | $181,400 | $285,286 | $210,749 | $271,195 | $246,657 | $237,130 | $196,417 |
| NEW HAMPSHIRE | | | | | | | | | | | |
| Total Awards | $17,292,608 | $23,322,221 | $27,115,285 | $30,005,188 | $27,740,131 | $28,562,404 | $27,899,565 | $31,009,523 | $30,979,821 | $28,777,694 | $272,704,440 |
| No. of Awards | 100 | 108 | 126 | 123 | 114 | 112 | 112 | 119 | 122 | 120 | 1,156 |
| Average Awards | $172,926 | $215,946 | $215,201 | $243,945 | $243,334 | $255,021 | $249,103 | $260,584 | $253,933 | $239,814 | $235,903 |
| NEW JERSEY | | | | | | | | | | | |
| Total Awards | $27,283,357 | $31,739,640 | $32,688,302 | $34,341,233 | $38,129,138 | $36,347,498 | $37,444,789 | $45,077,756 | $43,613,976 | $48,626,493 | $375,292,182 |
| No. of Awards | 136 | 141 | 162 | 154 | 165 | 165 | 159 | 178 | 177 | 190 | 1,627 |
| Average Awards | $200,613 | $225,104 | $201,780 | $222,995 | $231,086 | $220,288 | $235,502 | $253,246 | $246,407 | $255,929 | $230,665 |
| NEW MEXICO | | | | | | | | | | | |
| Total Awards | $8,056,859 | $9,847,281 | $11,529,492 | $11,855,119 | $12,953,892 | $18,711,091 | $17,274,869 | $14,659,120 | $17,305,692 | $17,824,802 | $140,018,217 |
| No. of Awards | 48 | 60 | 71 | 61 | 71 | 77 | 68 | 60 | 59 | 63 | 638 |
| Average Awards | $167,851 | $164,121 | $162,387 | $194,346 | $182,449 | $243,001 | $254,042 | $244,319 | $293,317 | $282,933 | $219,464 |
| NEW YORK | | | | | | | | | | | |
| Total Awards | $375,856,489 | $380,723,116 | $406,396,368 | $435,542,173 | $426,762,138 | $441,363,181 | $435,642,534 | $445,972,990 | $488,076,187 | $552,526,128 | $4,388,861,304 |
| No. of Awards | 1,556 | 1,547 | 1,587 | 1,614 | 1,516 | 1,561 | 1,477 | 1,540 | 1,693 | 1,796 | 15,887 |
| Average Awards | $241,553 | $246,104 | $256,078 | $269,853 | $281,505 | $282,744 | $294,951 | $289,593 | $288,291 | $307,643 | $276,255 |
| NORTH CAROLINA | | | | | | | | | | | |
| Total Awards | $178,140,013 | $186,547,290 | $209,771,778 | $222,080,113 | $237,560,251 | $256,667,379 | $268,265,754 | $284,974,077 | $291,978,426 | $309,853,433 | $2,445,838,514 |
| No. of Awards | 836 | 842 | 895 | 925 | 958 | 986 | 994 | 1,016 | 1,037 | 1,037 | 9,526 |
| Average Awards | $213,086 | $221,553 | $234,382 | $240,087 | $247,975 | $260,312 | $269,885 | $280,486 | $281,561 | $298,798 | $256,754 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| NORTH DAKOTA | | | | | | | | | | | |
| Total Awards | $1,199,797 | $834,468 | $1,373,167 | $1,079,626 | $1,239,064 | $1,272,718 | $1,906,796 | $1,907,325 | $1,618,064 | $775,647 | $13,206,672 |
| No. of Awards | 12 | 8 | 7 | 8 | 9 | 11 | 16 | 10 | 11 | 6 | 98 |
| Average Awards | $99,983 | $104,309 | $196,167 | $134,953 | $137,674 | $115,702 | $119,175 | $190,733 | $147,097 | $129,275 | $134,762 |
| OHIO | | | | | | | | | | | |
| Total Awards | $110,536,106 | $114,013,903 | $132,206,639 | $144,598,030 | $147,276,230 | $161,106,902 | $165,624,876 | $176,467,884 | $197,039,690 | $205,145,885 | $1,554,016,145 |
| No. of Awards | 566 | 555 | 604 | 626 | 612 | 633 | 643 | 677 | 745 | 762 | 6,423 |
| Average Awards | $195,293 | $205,430 | $218,885 | $230,987 | $240,647 | $254,513 | $257,581 | $260,662 | $264,483 | $269,220 | $241,946 |
| OKLAHOMA | | | | | | | | | | | |
| Total Awards | $3,207,983 | $3,889,314 | $4,181,781 | $4,343,571 | $4,463,295 | $4,884,535 | $5,610,089 | $11,561,094 | $12,500,960 | $15,289,188 | $69,931,810 |
| No. of Awards | 30 | 36 | 40 | 37 | 39 | 41 | 39 | 64 | 62 | 60 | 448 |
| Average Awards | $106,933 | $108,037 | $104,545 | $117,394 | $114,443 | $119,135 | $143,848 | $180,642 | $201,628 | $254,820 | $156,098 |
| OREGON | | | | | | | | | | | |
| Total Awards | $21,239,989 | $22,645,699 | $25,664,890 | $27,383,709 | $28,120,367 | $32,873,317 | $29,641,321 | $30,830,382 | $40,197,196 | $44,626,502 | $303,223,372 |
| No. of Awards | 141 | 141 | 152 | 148 | 148 | 154 | 151 | 158 | 190 | 208 | 1,591 |
| Average Awards | $150,638 | $160,608 | $168,848 | $185,025 | $190,002 | $213,463 | $196,300 | $195,129 | $211,564 | $214,550 | $190,587 |
| PENNSYLVANIA | | | | | | | | | | | |
| Total Awards | $203,325,699 | $225,998,338 | $262,638,376 | $301,392,226 | $311,968,936 | $327,540,213 | $363,286,568 | $370,126,342 | $408,863,686 | $458,449,889 | $3,233,590,273 |
| No. of Awards | 997 | 1,035 | 1,138 | 1,191 | 1,207 | 1,309 | 1,391 | 1,444 | 1,532 | 1,626 | 12,870 |
| Average Awards | $203,938 | $218,356 | $230,789 | $253,058 | $258,466 | $250,222 | $261,169 | $256,320 | $266,882 | $281,950 | $251,250 |
| RHODE ISLAND | | | | | | | | | | | |
| Total Awards | $11,399,274 | $10,963,048 | $11,414,702 | $10,557,612 | $10,347,875 | $13,111,146 | $14,188,597 | $15,331,156 | $17,682,297 | $16,735,647 | $131,731,354 |
| No. of Awards | 64 | 62 | 66 | 52 | 51 | 62 | 63 | 72 | 81 | 79 | 652 |
| Average Awards | $178,114 | $176,823 | $172,950 | $203,031 | $202,900 | $211,470 | $225,216 | $212,933 | $218,300 | $211,844 | $202,042 |
| SOUTH CAROLINA | | | | | | | | | | | |
| Total Awards | $13,069,026 | $15,220,546 | $19,074,775 | $16,688,881 | $17,269,378 | $22,358,896 | $23,461,356 | $26,366,237 | $27,782,080 | $33,072,338 | $214,363,513 |
| No. of Awards | 93 | 98 | 109 | 96 | 94 | 116 | 119 | 122 | 120 | 139 | 1,106 |
| Average Awards | $140,527 | $155,312 | $174,998 | $173,843 | $183,717 | $192,749 | $197,154 | $216,117 | $231,517 | $237,930 | $193,819 |
| SOUTH DAKOTA | | | | | | | | | | | |
| Total Awards | $467,701 | $390,769 | $528,838 | $748,762 | $369,297 | $725,008 | $603,947 | $678,245 | $1,257,291 | $1,033,015 | $6,802,873 |
| No. of Awards | 9 | 9 | 9 | 9 | 6 | 10 | 7 | 8 | 12 | 11 | 90 |
| Average Awards | $51,967 | $43,419 | $58,760 | $83,196 | $61,550 | $72,501 | $86,278 | $84,781 | $104,774 | $93,910 | $75,587 |
| TENNESSEE | | | | | | | | | | | |
| Total Awards | $72,734,918 | $81,743,944 | $88,339,444 | $93,158,183 | $95,117,923 | $93,901,393 | $100,225,732 | $102,616,139 | $112,453,595 | $116,545,988 | $956,837,259 |
| No. of Awards | 364 | 390 | 410 | 411 | 389 | 404 | 406 | 413 | 440 | 459 | 4,086 |
| Average Awards | $199,821 | $209,600 | $215,462 | $226,662 | $244,519 | $232,429 | $246,861 | $248,465 | $255,576 | $253,913 | $234,175 |
| TEXAS | | | | | | | | | | | |
| Total Awards | $185,686,866 | $194,428,928 | $214,361,506 | $230,762,866 | $246,075,969 | $269,868,426 | $271,210,090 | $287,005,399 | $299,052,088 | $336,628,897 | $2,535,081,035 |
| No. of Awards | 1,045 | 1,046 | 1,106 | 1,103 | 1,114 | 1,137 | 1,144 | 1,130 | 1,198 | 1,264 | 11,287 |
| Average Awards | $177,691 | $185,879 | $193,817 | $209,214 | $220,894 | $237,351 | $237,072 | $253,987 | $249,626 | $266,320 | $224,602 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| UTAH | | | | | | | | | | | |
| Total Awards | $31,122,847 | $32,852,329 | $37,529,116 | $40,425,105 | $37,488,457 | $39,149,064 | $47,978,214 | $44,832,095 | $50,131,137 | $49,723,785 | $411,232,149 |
| No. of Awards | 161 | 166 | 177 | 185 | 179 | 173 | 180 | 178 | 190 | 185 | 1,774 |
| Average Awards | $193,310 | $197,906 | $212,029 | $218,514 | $209,433 | $226,295 | $266,546 | $251,866 | $263,848 | $268,777 | $231,811 |
| VERMONT | | | | | | | | | | | |
| Total Awards | $22,573,547 | $25,228,467 | $27,858,798 | $25,248,214 | $25,998,425 | $24,215,296 | $23,367,475 | $23,927,476 | $23,159,607 | $27,273,921 | $248,851,226 |
| No. of Awards | 122 | 122 | 130 | 120 | 114 | 105 | 98 | 103 | 86 | 105 | 1,105 |
| Average Awards | $185,029 | $206,791 | $214,298 | $210,402 | $228,056 | $230,622 | $238,444 | $232,306 | $269,298 | $259,752 | $225,205 |
| VIRGINIA | | | | | | | | | | | |
| Total Awards | $66,322,042 | $70,241,049 | $77,905,176 | $86,408,984 | $85,505,975 | $83,338,685 | $83,887,328 | $85,265,733 | $91,998,261 | $100,651,194 | $831,524,427 |
| No. of Awards | 386 | 381 | 405 | 412 | 411 | 396 | 397 | 395 | 411 | 445 | 4,039 |
| Average Awards | $171,819 | $184,360 | $192,358 | $209,731 | $208,044 | $210,451 | $211,303 | $215,863 | $223,840 | $226,182 | $205,874 |
| WASHINGTON | | | | | | | | | | | |
| Total Awards | $93,981,314 | $105,335,104 | $113,628,970 | $116,886,631 | $115,386,965 | $126,289,722 | $134,386,303 | $137,847,726 | $147,295,226 | $159,946,877 | $1,250,984,838 |
| No. of Awards | 395 | 422 | 435 | 427 | 411 | 465 | 501 | 523 | 538 | 535 | 4,652 |
| Average Awards | $237,927 | $249,609 | $261,216 | $273,739 | $280,747 | $271,591 | $268,236 | $263,571 | $273,783 | $298,966 | $268,913 |
| WEST VIRGINIA | | | | | | | | | | | |
| Total Awards | $2,765,356 | $2,866,843 | $3,004,861 | $4,837,271 | $4,878,875 | $4,212,143 | $3,435,470 | $4,549,472 | $4,740,292 | $5,649,640 | $40,940,223 |
| No. of Awards | 19 | 24 | 22 | 30 | 34 | 29 | 22 | 33 | 34 | 32 | 279 |
| Average Awards | $145,545 | $119,452 | $136,585 | $161,242 | $143,496 | $145,246 | $156,158 | $137,863 | $139,420 | $176,551 | $146,739 |
| WISCONSIN | | | | | | | | | | | |
| Total Awards | $64,563,211 | $68,759,024 | $72,967,465 | $80,537,776 | $85,644,380 | $88,418,897 | $95,579,834 | $98,874,760 | $100,746,385 | $111,557,830 | $867,649,562 |
| No. of Awards | 346 | 367 | 368 | 385 | 379 | 374 | 401 | 415 | 414 | 452 | 3,901 |
| Average Awards | $186,599 | $187,354 | $198,281 | $209,189 | $225,975 | $236,414 | $238,354 | $238,252 | $243,349 | $246,809 | $222,417 |
| U. S. TOTAL | | | | | | | | | | | |
| Total Awards | $3,200,591,002 | $3,412,504,210 | $3,713,041,054 | $4,016,278,284 | $4,131,392,237 | $4,410,331,859 | $4,533,338,564 | $4,753,039,279 | $5,042,355,957 | $5,510,948,329 | $42,723,987,939 |
| No. of Awards | 15,682 | 15,926 | 16,705 | 16,961 | 16,773 | 17,456 | 17,529 | 18,028 | 18,734 | 19,525 | 173,319 |
| Average Awards | $204,093 | $214,273 | $222,271 | $236,795 | $246,312 | $252,654 | $258,619 | $263,648 | $269,155 | $282,251 | $246,504 |

*Awards include research and non-research awards. Alaska, Delaware, Idaho, Maine, Montana and Wyoming have no medical school.

SOURCE: Data provided by the Office of Reports and Analysis, Office of Extramural Research, National Institutes of Health, Bethesda, MD, August 1999.

APPENDIX D - 2

GROWTH OF TOTAL NIH AWARDS TO MEDICAL SCHOOLS IN ALL STATES*

Total Awards, No. of Awards and Average Awards

1989 to 1998

| State | 1989 to 1990 | 1990 to 1991 | 1991 to 1992 | 1992 to 1993 | 1993 to 1994 | 1994 to 1995 | 1995 to 1996 | 1996 to 1997 | 1997 to 1998 | 10-Year Growth |
|---|---|---|---|---|---|---|---|---|---|---|
| ALABAMA | | | | | | | | | | |
| Total Awards | 5.4% | 21.4% | 6.2% | 4.7% | 9.8% | 7.1% | 12.2% | 5.7% | 12.0% | 13.6% |
| No. of Awards | 0.6% | 19.0% | 1.5% | 8.9% | 5.4% | 6.9% | 4.0% | 3.9% | 3.3% | 7.4% |
| Average Awards | 4.7% | 2.0% | 4.7% | -3.8% | 4.1% | 0.2% | 7.8% | 1.8% | 8.4% | 3.7% |
| ARIZONA | | | | | | | | | | |
| Total Awards | 15.6% | 7.0% | 2.6% | 5.6% | -6.6% | 7.1% | -9.6% | 2.2% | 15.8% | 4.8% |
| No. of Awards | 11.8% | 11.4% | 0.0% | -11.8% | 1.8% | -2.6% | -7.2% | 7.8% | 4.5% | 1.5% |
| Average Awards | 3.4% | -4.0% | 2.6% | 19.8% | -8.2% | 10.0% | -2.6% | -5.2% | 10.8% | 2.9% |
| ARKANSAS | | | | | | | | | | |
| Total Awards | 5.4% | 40.4% | 1.5% | 1.9% | 29.0% | 11.8% | 19.5% | -5.7% | 27.6% | 24.2% |
| No. of Awards | -3.1% | 24.2% | -16.9% | 1.6% | 12.3% | 8.2% | 6.3% | -11.9% | 20.3% | 4.3% |
| Average Awards | 8.8% | 13.1% | 22.1% | 0.3% | 14.8% | 3.4% | 12.4% | 7.0% | 6.1% | 14.3% |
| CALIFORNIA | | | | | | | | | | |
| Total Awards | 8.3% | -1.3% | 10.3% | 3.2% | 4.4% | 0.8% | 4.2% | 3.3% | 9.3% | 5.6% |
| No. of Awards | 1.7% | 0.0% | 0.8% | -3.2% | 2.5% | 0.1% | 1.3% | 0.9% | 3.5% | 0.9% |
| Average Awards | 6.4% | -1.3% | 9.5% | 6.5% | 1.8% | 0.7% | 2.9% | 2.4% | 5.7% | 4.4% |
| COLORADO | | | | | | | | | | |
| Total Awards | 11.1% | 16.9% | 8.6% | 10.1% | 16.1% | 2.1% | 3.1% | 8.1% | 9.8% | 13.9% |
| No. of Awards | 8.2% | 0.4% | 4.7% | -1.1% | 19.5% | -6.7% | -0.7% | 3.8% | 6.0% | 4.1% |
| Average Awards | 2.7% | 16.4% | 3.7% | 11.4% | -2.8% | 9.4% | 3.9% | 4.1% | 3.6% | 7.2% |
| CONNECTICUT | | | | | | | | | | |
| Total Awards | 0.8% | 10.2% | 9.6% | -0.5% | 6.6% | 0.0% | 8.8% | 7.3% | 3.9% | 6.3% |
| No. of Awards | -2.0% | 6.8% | 2.5% | 2.3% | 5.1% | -4.5% | 4.6% | 4.0% | 1.9% | 2.4% |
| Average Awards | 2.9% | 3.2% | 6.9% | -2.7% | 1.4% | 4.7% | 4.0% | 3.2% | 2.0% | 3.2% |
| DIST. OF COLUMBIA | | | | | | | | | | |
| Total Awards | 12.8% | 16.1% | 11.1% | 6.0% | 19.0% | -10.9% | 1.8% | 10.8% | 12.0% | 11.8% |
| No. of Awards | 1.6% | 14.1% | 0.7% | 0.0% | 5.4% | -2.6% | 2.0% | 1.9% | -0.6% | 2.6% |
| Average Awards | 11.0% | 1.8% | 10.4% | 6.0% | 12.8% | -8.6% | -0.2% | 8.7% | 12.7% | 7.4% |

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|---|---|---|---|---|---|---|---|---|---|---|
| FLORIDA | | | | | | | | | | |
| Total Awards | 3.4% | 6.3% | 5.1% | 5.1% | 10.7% | -11.2% | 0.4% | 7.7% | 8.3% | 4.4% |
| No. of Awards | -4.6% | 4.2% | -1.6% | 2.7% | -2.9% | -5.5% | 0.3% | 4.4% | 2.2% | -0.1% |
| Average Awards | 8.3% | 2.0% | 6.8% | 2.3% | 14.1% | -6.1% | 0.1% | 3.2% | 5.9% | 4.6% |
| GEORGIA | | | | | | | | | | |
| Total Awards | 9.8% | 15.4% | 16.6% | 12.3% | 6.1% | 0.2% | 2.6% | 17.3% | 18.7% | 16.9% |
| No. of Awards | 0.0% | 9.5% | 9.4% | 6.6% | 3.7% | -2.1% | 4.0% | 9.7% | 11.5% | 7.2% |
| Average Awards | 9.8% | 5.4% | 6.6% | 5.3% | 2.3% | 2.3% | -1.3% | 7.0% | 6.4% | 5.8% |
| HAWAII | | | | | | | | | | |
| Total Awards | 88.1% | 23.2% | 10.8% | -3.7% | 0.5% | -20.7% | 31.2% | 15.7% | -20.6% | 15.3% |
| No. of Awards | 8.3% | 0.0% | -7.7% | -25.0% | 0.0% | -22.2% | 14.3% | 12.5% | -22.2% | -4.6% |
| Average Awards | 73.6% | 23.2% | 20.0% | 28.4% | 0.5% | 2.0% | 14.8% | 2.8% | 2.1% | 34.1% |
| ILLINOIS | | | | | | | | | | |
| Total Awards | 1.0% | 8.5% | 6.0% | 4.6% | 4.5% | 10.5% | 8.9% | 1.5% | 7.5% | 7.4% |
| No. of Awards | -2.2% | 8.3% | 1.5% | -2.9% | 3.1% | 3.2% | 4.9% | 1.2% | 6.3% | 2.8% |
| Average Awards | 3.3% | 0.1% | 4.4% | 7.7% | 1.3% | 7.1% | 3.9% | 0.3% | 1.2% | 3.7% |
| INDIANA | | | | | | | | | | |
| Total Awards | 4.3% | 19.4% | 15.2% | 7.0% | 6.2% | 8.7% | 6.3% | 11.5% | 12.2% | 15.1% |
| No. of Awards | 3.8% | 9.6% | 12.1% | 0.0% | 0.0% | -1.8% | 8.5% | 8.4% | 6.7% | 6.4% |
| Average Awards | 0.5% | 9.0% | 2.8% | 7.0% | 6.2% | 10.7% | -2.1% | 2.9% | 5.1% | 5.5% |
| IOWA | | | | | | | | | | |
| Total Awards | 6.4% | 3.3% | 6.8% | 6.2% | -0.6% | 2.0% | 0.1% | 4.6% | 8.3% | 4.8% |
| No. of Awards | -10.4% | -1.6% | -0.4% | 1.2% | -8.5% | 0.0% | 2.6% | 9.4% | 13.3% | 0.4% |
| Average Awards | 18.7% | 5.0% | 7.3% | 4.9% | 8.5% | 2.0% | -2.4% | -4.5% | -4.4% | 4.3% |
| KANSAS | | | | | | | | | | |
| Total Awards | 23.0% | 17.0% | 6.7% | 18.8% | 2.1% | 8.7% | -7.4% | -11.0% | 35.3% | 14.0% |
| No. of Awards | 9.1% | 3.6% | -9.2% | 10.1% | -2.3% | -3.5% | -7.3% | -6.6% | 12.7% | 0.4% |
| Average Awards | 12.7% | 13.0% | 17.6% | 7.9% | 4.5% | 12.6% | 0.0% | -4.7% | 20.1% | 13.1% |
| KENTUCKY | | | | | | | | | | |
| Total Awards | -0.3% | 20.9% | 27.0% | 7.6% | 10.4% | 5.2% | 16.6% | 8.1% | 3.4% | 16.6% |
| No. of Awards | 0.0% | 16.2% | 15.6% | 5.7% | 8.7% | 0.0% | 14.8% | 2.7% | 2.1% | 9.5% |
| Average Awards | -0.3% | 4.0% | 9.9% | 1.9% | 1.5% | 5.2% | 1.6% | 5.3% | 1.2% | 3.8% |
| LOUISIANA | | | | | | | | | | |
| Total Awards | -1.2% | 22.1% | 5.7% | -16.6% | 15.0% | -7.1% | 14.9% | 1.9% | 4.7% | 4.3% |
| No. of Awards | -6.2% | 5.1% | -2.8% | -12.2% | 26.2% | -7.1% | 16.1% | 3.6% | -2.3% | 1.8% |
| Average Awards | 5.3% | 16.2% | 8.7% | -5.0% | -8.9% | 0.1% | -1.1% | -1.6% | 7.2% | 2.2% |
| MARYLAND | | | | | | | | | | |
| Total Awards | 9.4% | 8.6% | 14.8% | 2.9% | 4.5% | 0.1% | 6.4% | 2.9% | 10.1% | 8.6% |
| No. of Awards | 5.6% | 3.6% | 6.7% | -0.3% | 4.0% | -2.0% | 5.3% | -0.3% | 4.6% | 3.3% |
| Average Awards | 3.6% | 4.8% | 7.6% | 3.3% | 0.5% | 2.1% | 1.1% | 3.2% | 5.3% | 4.0% |

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| MASSACHUSETTS | | | | | | | | | | |
| Total Awards | 1.4% | 13.4% | 4.4% | -1.3% | 9.9% | 1.3% | 8.4% | 7.3% | 7.4% | 7.2% |
| No. of Awards | 0.9% | 6.4% | -1.6% | -3.1% | 4.2% | 1.1% | 3.6% | 5.7% | 2.0% | 2.3% |
| Average Awards | 0.5% | 6.5% | 6.1% | 1.8% | 5.5% | 0.2% | 4.6% | 1.5% | 5.3% | 4.1% |
| MICHIGAN | | | | | | | | | | |
| Total Awards | 6.2% | 11.7% | 7.7% | 1.8% | 21.8% | 1.2% | 3.8% | 8.2% | 6.0% | 10.1% |
| No. of Awards | 3.2% | 3.2% | 5.8% | -3.0% | 12.5% | -1.3% | 1.2% | 1.9% | 1.3% | 3.0% |
| Average Awards | 3.0% | 8.2% | 1.8% | 4.9% | 8.2% | 2.5% | 2.6% | 6.2% | 4.7% | 5.6% |
| MINNESOTA | | | | | | | | | | |
| Total Awards | 2.7% | 3.8% | -3.5% | 7.2% | 7.0% | 14.8% | 4.5% | -6.8% | 0.6% | 3.6% |
| No. of Awards | 2.4% | 3.6% | -0.3% | -2.9% | 1.0% | 4.2% | -0.3% | -4.7% | 0.3% | 0.3% |
| Average Awards | 0.3% | 0.2% | -3.2% | 10.3% | 5.9% | 10.2% | 4.8% | -2.2% | 0.3% | 3.2% |
| MISSISSIPPI | | | | | | | | | | |
| Total Awards | 2.9% | -6.4% | -15.1% | 31.5% | 1.0% | -5.6% | 3.3% | 9.2% | -10.7% | 0.4% |
| No. of Awards | -1.9% | -9.6% | -23.4% | 5.6% | 0.0% | 2.6% | 2.6% | 5.0% | -7.1% | -2.9% |
| Average Awards | 4.9% | 3.6% | 10.9% | 24.6% | 1.0% | -8.0% | 0.7% | 4.0% | -3.8% | 4.5% |
| MISSOURI | | | | | | | | | | |
| Total Awards | 17.3% | 5.1% | 3.3% | 5.5% | 8.8% | 9.0% | 5.5% | 3.7% | 11.5% | 10.5% |
| No. of Awards | 6.0% | -2.1% | 0.2% | 0.0% | 7.2% | 9.9% | -1.1% | 0.3% | 2.2% | 2.7% |
| Average Awards | 10.7% | 7.3% | 3.2% | 5.5% | 1.5% | -0.8% | 6.6% | 3.5% | 9.1% | 6.3% |
| NEBRASKA | | | | | | | | | | |
| Total Awards | 8.6% | -5.0% | 17.3% | 10.8% | -4.7% | 13.9% | 2.9% | 1.9% | 8.6% | 7.3% |
| No. of Awards | -1.2% | -3.6% | 0.0% | 11.1% | -6.7% | 13.1% | -13.7% | 0.0% | 6.1% | 0.3% |
| Average Awards | 9.8% | -1.4% | 17.3% | -0.3% | 2.1% | 0.7% | 19.2% | 1.9% | 2.3% | 6.9% |
| NEVADA | | | | | | | | | | |
| Total Awards | -2.5% | 15.6% | 42.3% | -11.7% | 45.6% | -46.8% | 43.0% | 9.1% | 12.2% | 10.2% |
| No. of Awards | 8.7% | 16.0% | 24.1% | -25.0% | -7.4% | -28.0% | 11.1% | 20.0% | 16.7% | 2.4% |
| Average Awards | -10.3% | -0.4% | 14.6% | 17.7% | 57.3% | -26.1% | 28.7% | -9.0% | -3.9% | 6.4% |
| NEW HAMPSHIRE | | | | | | | | | | |
| Total Awards | 34.9% | 16.3% | 10.7% | -7.5% | 3.0% | -2.3% | 11.1% | -0.1% | -7.1% | 7.4% |
| No. of Awards | 8.0% | 16.7% | -2.4% | -7.3% | -1.8% | 0.0% | 6.3% | 2.5% | -1.6% | 2.2% |
| Average Awards | 24.9% | -0.3% | 13.4% | -0.3% | 4.8% | -2.3% | 4.6% | -2.6% | -5.6% | 4.3% |
| NEW JERSEY | | | | | | | | | | |
| Total Awards | 16.3% | 3.0% | 5.1% | 11.0% | -4.7% | 3.0% | 20.4% | -3.2% | 11.5% | 8.7% |
| No. of Awards | 3.7% | 14.9% | -4.9% | 7.1% | 0.0% | -3.6% | 11.9% | -0.6% | 7.3% | 4.4% |
| Average Awards | 12.2% | -10.4% | 10.5% | 3.6% | -4.7% | 6.9% | 7.5% | -2.7% | 3.9% | 3.1% |

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| NEW MEXICO | | | | | | | | | | |
| Total Awards | 22.2% | 17.1% | 2.8% | 9.3% | 44.4% | -7.7% | -15.1% | 18.1% | 3.0% | 13.5% |
| No. of Awards | 25.0% | 18.3% | -14.1% | 16.4% | 8.5% | -11.7% | -11.8% | -1.7% | 6.8% | 3.5% |
| Average Awards | -2.2% | -1.1% | 19.7% | -6.1% | 33.2% | 4.5% | -3.8% | 20.1% | -3.5% | 7.6% |
| NEW YORK | | | | | | | | | | |
| Total Awards | 1.3% | 6.7% | 7.2% | -2.0% | 3.4% | -1.3% | 2.4% | 9.4% | 13.2% | 5.2% |
| No. of Awards | -0.6% | 2.6% | 1.7% | -6.1% | 3.0% | -5.4% | 4.3% | 9.9% | 6.1% | 1.7% |
| Average Awards | 1.9% | 4.1% | 5.4% | 4.3% | 0.4% | 4.3% | -1.8% | -0.4% | 6.7% | 3.0% |
| NORTH CAROLINA | | | | | | | | | | |
| Total Awards | 4.7% | 12.4% | 5.9% | 7.0% | 8.0% | 4.5% | 6.2% | 2.5% | 6.1% | 8.2% |
| No. of Awards | 0.7% | 6.3% | 3.4% | 3.6% | 2.9% | 0.8% | 2.2% | 2.1% | 0.0% | 2.7% |
| Average Awards | 4.0% | 5.8% | 2.4% | 3.3% | 5.0% | 3.7% | 3.9% | 0.4% | 6.1% | 4.5% |
| NORTH DAKOTA | | | | | | | | | | |
| Total Awards | -30.4% | 64.6% | -21.4% | 14.8% | 2.7% | 49.8% | 0.0% | -15.2% | -52.1% | -3.9% |
| No. of Awards | -33.3% | -12.5% | 14.3% | 12.5% | 22.2% | 45.5% | -37.5% | 10.0% | -45.5% | -5.6% |
| Average Awards | 4.3% | 88.1% | -31.2% | 2.0% | -16.0% | 3.0% | 60.0% | -22.9% | -12.1% | 3.3% |
| OHIO | | | | | | | | | | |
| Total Awards | 3.1% | 16.0% | 9.4% | 1.9% | 9.4% | 2.8% | 6.5% | 11.7% | 4.1% | 9.5% |
| No. of Awards | -1.9% | 8.8% | 3.6% | -2.2% | 3.4% | 1.6% | 5.3% | 10.0% | 2.3% | 3.8% |
| Average Awards | 5.2% | 6.5% | 5.5% | 4.2% | 5.8% | 1.2% | 1.2% | 1.5% | 1.8% | 4.2% |
| OKLAHOMA | | | | | | | | | | |
| Total Awards | 21.2% | 7.5% | 3.9% | 2.8% | 9.4% | 14.9% | 106.1% | 8.1% | 22.3% | 41.8% |
| No. of Awards | 20.0% | 11.1% | -7.5% | 5.4% | 5.1% | -4.9% | 64.1% | -3.1% | -3.2% | 11.1% |
| Average Awards | 1.0% | -3.2% | 12.3% | -2.5% | 4.1% | 20.7% | 25.6% | 11.6% | 26.4% | 15.4% |
| OREGON | | | | | | | | | | |
| Total Awards | 6.6% | 13.3% | 6.7% | 2.7% | 16.9% | -9.8% | 4.0% | 30.4% | 11.0% | 12.2% |
| No. of Awards | 0.0% | 7.8% | -2.6% | 0.0% | 4.1% | -1.9% | 4.6% | 20.3% | 9.5% | 5.3% |
| Average Awards | 6.6% | 5.1% | 9.6% | 2.7% | 12.3% | -8.0% | -0.6% | 8.4% | 1.4% | 4.7% |
| PENNSYLVANIA | | | | | | | | | | |
| Total Awards | 11.2% | 16.2% | 14.8% | 3.5% | 5.0% | 10.9% | 1.9% | 10.5% | 12.1% | 13.9% |
| No. of Awards | 3.8% | 10.0% | 4.7% | 1.3% | 8.5% | 6.3% | 3.8% | 6.1% | 6.1% | 7.0% |
| Average Awards | 7.1% | 5.7% | 9.6% | 2.1% | -3.2% | 4.4% | -1.9% | 4.1% | 5.6% | 4.3% |
| RHODE ISLAND | | | | | | | | | | |
| Total Awards | -3.8% | 4.1% | -7.5% | -2.0% | 26.7% | 8.2% | 8.1% | 15.3% | -5.4% | 5.2% |
| No. of Awards | -3.1% | 6.5% | -21.2% | -1.9% | 21.6% | 1.6% | 14.3% | 12.5% | -2.5% | 2.6% |
| Average Awards | -0.7% | -2.2% | 17.4% | -0.1% | 4.2% | 6.5% | -5.5% | 2.5% | -3.0% | 2.1% |

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|---|---|---|---|---|---|---|---|---|---|---|
| SOUTH CAROLINA | | | | | | | | | | |
| Total Awards | 16.5% | 25.3% | -12.5% | 3.5% | 29.5% | 4.9% | 12.4% | 5.4% | 19.0% | 17.0% |
| No. of Awards | 5.4% | 11.2% | -11.9% | -2.1% | 23.4% | 2.6% | 2.5% | -1.6% | 15.8% | 5.5% |
| Average Awards | 10.5% | 12.7% | -0.7% | 5.7% | 4.9% | 2.3% | 9.6% | 7.1% | 2.8% | 7.7% |
| SOUTH DAKOTA | | | | | | | | | | |
| Total Awards | -16.4% | 35.3% | 41.6% | -50.7% | 96.3% | -16.7% | 12.3% | 85.4% | -17.8% | 13.4% |
| No. of Awards | 0.0% | 0.0% | 0.0% | -33.3% | 66.7% | -30.0% | 14.3% | 50.0% | -8.3% | 2.5% |
| Average Awards | -16.4% | 35.3% | 41.6% | -26.0% | 17.8% | 19.0% | -1.7% | 23.6% | -10.4% | 9.0% |
| TENNESSEE | | | | | | | | | | |
| Total Awards | 12.4% | 8.1% | 5.5% | 2.1% | -1.3% | 6.7% | 2.4% | 9.6% | 3.6% | 6.7% |
| No. of Awards | 7.1% | 5.1% | 0.2% | -5.4% | 3.9% | 0.5% | 1.7% | 6.5% | 4.3% | 2.9% |
| Average Awards | 4.9% | 2.8% | 5.2% | 7.9% | -4.9% | 6.2% | 0.6% | 2.9% | -0.7% | 3.0% |
| TEXAS | | | | | | | | | | |
| Total Awards | 4.7% | 10.3% | 7.7% | 6.6% | 9.7% | 0.5% | 5.8% | 4.2% | 12.6% | 9.0% |
| No. of Awards | 0.1% | 5.7% | -0.3% | 1.0% | 2.1% | 0.6% | -1.2% | 6.0% | 5.5% | 2.3% |
| Average Awards | 4.6% | 4.3% | 7.9% | 5.6% | 7.5% | -0.1% | 7.1% | -1.7% | 6.7% | 5.5% |
| UTAH | | | | | | | | | | |
| Total Awards | 5.6% | 14.2% | 7.7% | -7.3% | 4.4% | 22.6% | -6.6% | 11.8% | -0.8% | 6.6% |
| No. of Awards | 3.1% | 6.6% | 4.5% | -3.2% | -3.4% | 4.0% | -1.1% | 6.7% | -2.6% | 1.7% |
| Average Awards | 2.4% | 7.1% | 3.1% | -4.2% | 8.1% | 17.8% | -5.5% | 4.8% | 1.9% | 4.3% |
| VERMONT | | | | | | | | | | |
| Total Awards | 11.8% | 10.4% | -9.4% | 3.0% | -6.9% | -3.5% | 2.4% | -3.2% | 17.8% | 2.3% |
| No. of Awards | 0.0% | 6.6% | -7.7% | -5.0% | -7.9% | -6.7% | 5.1% | -16.5% | 22.1% | -1.5% |
| Average Awards | 11.8% | 3.6% | -1.8% | 8.4% | 1.1% | 3.4% | -2.6% | 15.9% | -3.5% | 4.5% |
| VIRGINIA | | | | | | | | | | |
| Total Awards | 5.9% | 10.9% | 10.9% | -1.0% | -2.5% | 0.7% | 1.6% | 7.9% | 9.4% | 5.8% |
| No. of Awards | -1.3% | 6.3% | 1.7% | -0.2% | -3.6% | 0.3% | -0.5% | 4.1% | 8.3% | 1.7% |
| Average Awards | 7.3% | 4.3% | 9.0% | -0.8% | 1.2% | 0.4% | 2.2% | 3.7% | 1.0% | 3.5% |
| WASHINGTON | | | | | | | | | | |
| Total Awards | 12.1% | 7.9% | 2.9% | -1.3% | 9.4% | 6.4% | 2.6% | 6.9% | 8.6% | 7.8% |
| No. of Awards | 6.8% | 3.1% | -1.8% | -3.7% | 13.1% | 7.7% | 4.4% | 2.9% | -0.6% | 3.9% |
| Average Awards | 4.9% | 4.6% | 4.8% | 2.6% | -3.3% | -1.2% | -1.7% | 3.9% | 9.2% | 2.9% |
| WEST VIRGINIA | | | | | | | | | | |
| Total Awards | 3.7% | 4.8% | 61.0% | 0.9% | -13.7% | -18.4% | 32.4% | 4.2% | 19.2% | 11.6% |
| No. of Awards | 26.3% | -8.3% | 36.4% | 13.3% | -14.7% | -24.1% | 50.0% | 3.0% | -5.9% | 7.6% |
| Average Awards | -17.9% | 14.3% | 18.1% | -11.0% | 1.2% | 7.5% | -11.7% | 1.1% | 26.6% | 2.4% |

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|---|---|---|---|---|---|---|---|---|---|---|
| WISCONSIN | | | | | | | | | | |
| Total Awards | 6.5% | 6.1% | 10.4% | 6.3% | 3.2% | 8.1% | 3.4% | 1.9% | 10.7% | 8.1% |
| No. of Awards | 6.1% | 0.3% | 4.6% | -1.6% | -1.3% | 7.2% | 3.5% | -0.2% | 9.2% | 3.4% |
| Average Awards | 0.4% | 5.8% | 5.5% | 8.0% | 4.6% | 0.8% | 0.0% | 2.1% | 1.4% | 3.6% |
| U. S. TOTAL | | | | | | | | | | |
| Total Awards | 6.6% | 8.8% | 8.2% | 2.9% | 6.8% | 2.8% | 4.8% | 6.1% | 9.3% | 8.0% |
| No. of Awards | 1.6% | 4.9% | 1.5% | -1.1% | 4.1% | 0.4% | 2.8% | 3.9% | 4.2% | 2.7% |
| Average Awards | 5.0% | 3.7% | 6.5% | 4.0% | 2.6% | 2.4% | 1.9% | 2.1% | 4.9% | 4.3% |

*Awards include research and non-research awards. Alaska, Delaware, Idaho, Maine, Montana and Wyoming have no medical school.

SOURCE: Data provided by the Office of Reports and Analysis, Office of Extramural Research, National Institutes of Health, Bethesda, MD, August 1999.

APPENDIX D - 3

STATE SHARES OF TOTAL NIH AWARDS TO MEDICAL SCHOOLS IN ALL STATES*

Total Awards and No. of Awards

1989 to 1998

| State | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 10-Year Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ALABAMA | | | | | | | | | | | |
| Total Awards | 1.3% | 1.2% | 1.4% | 1.4% | 1.4% | 1.4% | 1.5% | 1.6% | 1.6% | 1.6% | 1.5% |
| No. of Awards | 1.1% | 1.0% | 1.0% | 1.0% | 1.0% | 1.0% | 1.0% | 0.9% | 0.9% | 0.9% | 0.1% |
| ARIZONA | | | | | | | | | | | |
| Total Awards | 0.8% | 0.9% | 0.9% | 0.8% | 0.8% | 0.7% | 0.8% | 0.7% | 0.6% | 0.7% | 0.7% |
| No. of Awards | 0.7% | 0.7% | 0.8% | 0.7% | 0.7% | 0.7% | 0.6% | 0.6% | 0.6% | 0.6% | 0.7% |
| ARKANSAS | | | | | | | | | | | |
| Total Awards | 0.2% | 0.2% | 0.3% | 0.2% | 0.2% | 0.3% | 0.3% | 0.3% | 0.3% | 0.4% | 0.3% |
| No. of Awards | 0.4% | 0.4% | 0.5% | 0.4% | 0.4% | 0.4% | 0.5% | 0.5% | 0.4% | 0.5% | 0.4% |
| CALIFORNIA | | | | | | | | | | | |
| Total Awards | 14.7% | 14.9% | 13.5% | 13.8% | 13.8% | 13.5% | 13.2% | 13.2% | 12.8% | 12.8% | 13.5% |
| No. of Awards | 13.2% | 13.2% | 12.6% | 12.5% | 12.3% | 12.1% | 12.1% | 11.9% | 11.5% | 11.4% | 12.3% |
| COLORADO | | | | | | | | | | | |
| Total Awards | 1.3% | 1.4% | 1.5% | 1.5% | 1.6% | 1.7% | 1.7% | 1.7% | 1.7% | 1.7% | 1.6% |
| No. of Awards | 1.5% | 1.6% | 1.5% | 1.6% | 1.6% | 1.8% | 1.7% | 1.6% | 1.6% | 1.6% | 1.6% |
| CONNECTICUT | | | | | | | | | | | |
| Total Awards | 3.8% | 3.6% | 3.7% | 3.7% | 3.6% | 3.6% | 3.5% | 3.6% | 3.7% | 3.5% | 3.6% |
| No. of Awards | 3.4% | 3.3% | 3.4% | 3.4% | 3.5% | 3.5% | 3.4% | 3.4% | 3.4% | 3.4% | 3.4% |
| DIST. OF COLUMBIA | | | | | | | | | | | |
| Total Awards | 0.8% | 0.8% | 0.9% | 0.9% | 0.9% | 1.0% | 0.9% | 0.8% | 0.9% | 0.9% | 0.9% |
| No. of Awards | 0.8% | 0.8% | 0.9% | 0.9% | 0.9% | 0.9% | 0.9% | 0.9% | 0.8% | 0.8% | 0.8% |
| FLORIDA | | | | | | | | | | | |
| Total Awards | 2.2% | 2.1% | 2.1% | 2.0% | 2.1% | 2.1% | 1.8% | 1.8% | 1.8% | 1.8% | 2.0% |
| No. of Awards | 2.4% | 2.2% | 2.2% | 2.1% | 2.2% | 2.1% | 2.0% | 1.9% | 1.9% | 1.9% | 2.1% |
| GEORGIA | | | | | | | | | | | |
| Total Awards | 1.3% | 1.3% | 1.4% | 1.5% | 1.7% | 1.7% | 1.6% | 1.6% | 1.7% | 1.9% | 1.6% |
| No. of Awards | 1.6% | 1.6% | 1.7% | 1.8% | 1.9% | 1.9% | 1.9% | 1.9% | 2.0% | 2.1% | 1.8% |
| HAWAII | | | | | | | | | | | |
| Total Awards | 0.0% | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% | 0.0% | 0.0% | 0.1% | 0.0% | 0.0% |
| No. of Awards | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% | 0.0% | 0.0% | 0.0% | 0.0% | 0.1% |
| ILLINOIS | | | | | | | | | | | |
| Total Awards | 3.3% | 3.2% | 3.2% | 3.1% | 3.1% | 3.1% | 3.3% | 3.4% | 3.3% | 3.2% | 3.2% |
| No. of Awards | 3.5% | 3.4% | 3.5% | 3.5% | 3.4% | 3.4% | 3.5% | 3.6% | 3.5% | 3.5% | 3.5% |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| INDIANA | | | | | | | | | | | |
| Total Awards | 0.8% | 0.8% | 0.9% | 0.9% | 1.0% | 1.0% | 1.0% | 1.1% | 1.1% | 1.1% | 1.0% |
| No. of Awards | 0.8% | 0.9% | 0.9% | 1.0% | 1.0% | 1.0% | 0.9% | 1.0% | 1.0% | 1.1% | 1.0% |
| IOWA | | | | | | | | | | | |
| Total Awards | 1.6% | 1.6% | 1.5% | 1.5% | 1.6% | 1.4% | 1.4% | 1.4% | 1.3% | 1.3% | 1.5% |
| No. of Awards | 1.8% | 1.6% | 1.5% | 1.4% | 1.5% | 1.3% | 1.3% | 1.3% | 1.4% | 1.5% | 1.4% |
| KANSAS | | | | | | | | | | | |
| Total Awards | 0.3% | 0.3% | 0.3% | 0.3% | 0.4% | 0.4% | 0.4% | 0.4% | 0.3% | 0.4% | 0.3% |
| No. of Awards | 0.5% | 0.5% | 0.5% | 0.5% | 0.5% | 0.5% | 0.5% | 0.4% | 0.4% | 0.4% | 0.5% |
| KENTUCKY | | | | | | | | | | | |
| Total Awards | 0.5% | 0.4% | 0.5% | 0.6% | 0.6% | 0.6% | 0.6% | 0.7% | 0.7% | 0.7% | 0.6% |
| No. of Awards | 0.7% | 0.7% | 0.7% | 0.8% | 0.9% | 0.9% | 0.9% | 1.0% | 1.0% | 1.0% | 0.9% |
| LOUISIANA | | | | | | | | | | | |
| Total Awards | 0.8% | 0.7% | 0.8% | 0.8% | 0.6% | 0.7% | 0.6% | 0.7% | 0.6% | 0.6% | 0.7% |
| No. of Awards | 0.9% | 0.9% | 0.9% | 0.8% | 0.7% | 0.9% | 0.8% | 0.9% | 0.9% | 0.9% | 0.9% |
| MARYLAND | | | | | | | | | | | |
| Total Awards | 5.1% | 5.3% | 5.3% | 5.6% | 5.6% | 5.5% | 5.3% | 5.4% | 5.2% | 5.3% | 5.4% |
| No. of Awards | 4.7% | 4.9% | 4.8% | 5.1% | 5.1% | 5.1% | 5.0% | 5.1% | 4.9% | 4.9% | 4.9% |
| MASSACHUSETTS | | | | | | | | | | | |
| Total Awards | 4.6% | 4.4% | 4.6% | 4.4% | 4.3% | 4.4% | 4.3% | 4.5% | 4.5% | 4.4% | 4.4% |
| No. of Awards | 4.3% | 4.3% | 4.4% | 4.2% | 4.1% | 4.1% | 4.2% | 4.2% | 4.3% | 4.2% | 4.2% |
| MICHIGAN | | | | | | | | | | | |
| Total Awards | 3.3% | 3.3% | 3.4% | 3.4% | 3.3% | 3.8% | 3.7% | 3.7% | 3.8% | 3.7% | 3.6% |
| No. of Awards | 3.6% | 3.7% | 3.6% | 3.8% | 3.7% | 4.0% | 3.9% | 3.9% | 3.8% | 3.7% | 3.8% |
| MINNESOTA | | | | | | | | | | | |
| Total Awards | 1.9% | 1.8% | 1.7% | 1.5% | 1.6% | 1.6% | 1.8% | 1.8% | 1.6% | 1.4% | 1.6% |
| No. of Awards | 1.9% | 1.9% | 1.9% | 1.9% | 1.8% | 1.8% | 1.8% | 1.8% | 1.6% | 1.6% | 1.8% |
| MISSISSIPPI | | | | | | | | | | | |
| Total Awards | 0.2% | 0.2% | 0.2% | 0.1% | 0.2% | 0.2% | 0.2% | 0.1% | 0.2% | 0.1% | 0.2% |
| No. of Awards | 0.3% | 0.3% | 0.3% | 0.2% | 0.2% | 0.2% | 0.2% | 0.2% | 0.2% | 0.2% | 0.2% |
| MISSOURI | | | | | | | | | | | |
| Total Awards | 3.6% | 3.9% | 3.8% | 3.6% | 3.7% | 3.8% | 4.0% | 4.0% | 3.9% | 4.0% | 3.9% |
| No. of Awards | 3.7% | 3.9% | 3.6% | 3.6% | 3.6% | 3.7% | 4.1% | 3.9% | 3.8% | 3.7% | 3.8% |
| NEBRASKA | | | | | | | | | | | |
| Total Awards | 0.3% | 0.4% | 0.3% | 0.3% | 0.4% | 0.3% | 0.4% | 0.3% | 0.3% | 0.3% | 0.3% |
| No. of Awards | 0.5% | 0.5% | 0.5% | 0.5% | 0.5% | 0.5% | 0.5% | 0.5% | 0.4% | 0.4% | 0.5% |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| NEVADA | | | | | | | | | | | |
| Total Awards | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% | 0.2% | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% |
| No. of Awards | 0.1% | 0.2% | 0.2% | 0.2% | 0.2% | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% |
| NEW HAMPSHIRE | | | | | | | | | | | |
| Total Awards | 0.5% | 0.7% | 0.7% | 0.7% | 0.7% | 0.6% | 0.6% | 0.7% | 0.6% | 0.5% | 0.6% |
| No. of Awards | 0.6% | 0.7% | 0.8% | 0.7% | 0.7% | 0.6% | 0.6% | 0.7% | 0.7% | 0.6% | 0.7% |
| NEW JERSEY | | | | | | | | | | | |
| Total Awards | 0.9% | 0.9% | 0.9% | 0.9% | 0.9% | 0.8% | 0.8% | 0.9% | 0.9% | 0.9% | 0.9% |
| No. of Awards | 0.9% | 0.9% | 1.0% | 0.9% | 1.0% | 0.9% | 0.9% | 1.0% | 0.9% | 1.0% | 0.9% |
| NEW MEXICO | | | | | | | | | | | |
| Total Awards | 0.3% | 0.3% | 0.3% | 0.3% | 0.3% | 0.4% | 0.4% | 0.3% | 0.3% | 0.3% | 0.3% |
| No. of Awards | 0.3% | 0.4% | 0.4% | 0.4% | 0.4% | 0.4% | 0.4% | 0.3% | 0.3% | 0.3% | 0.4% |
| NEW YORK | | | | | | | | | | | |
| Total Awards | 11.7% | 11.2% | 10.9% | 10.8% | 10.3% | 10.0% | 9.6% | 9.4% | 9.7% | 10.0% | 10.3% |
| No. of Awards | 9.9% | 9.7% | 9.5% | 9.5% | 9.0% | 8.9% | 8.4% | 8.5% | 9.0% | 9.2% | 9.2% |
| NORTH CAROLINA | | | | | | | | | | | |
| Total Awards | 5.6% | 5.5% | 5.6% | 5.5% | 5.8% | 5.8% | 5.9% | 6.0% | 5.8% | 5.6% | 5.7% |
| No. of Awards | 5.3% | 5.3% | 5.4% | 5.5% | 5.7% | 5.6% | 5.7% | 5.6% | 5.5% | 5.3% | 5.5% |
| NORTH DAKOTA | | | | | | | | | | | |
| Total Awards | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| No. of Awards | 0.1% | 0.1% | 0.0% | 0.0% | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% | 0.0% | 0.1% |
| OHIO | | | | | | | | | | | |
| Total Awards | 3.5% | 3.3% | 3.6% | 3.6% | 3.6% | 3.7% | 3.7% | 3.7% | 3.9% | 3.7% | 3.6% |
| No. of Awards | 3.6% | 3.5% | 3.6% | 3.7% | 3.6% | 3.6% | 3.7% | 3.8% | 4.0% | 3.9% | 3.7% |
| OKLAHOMA | | | | | | | | | | | |
| Total Awards | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% | 0.2% | 0.2% | 0.3% | 0.2% |
| No. of Awards | 0.2% | 0.2% | 0.2% | 0.2% | 0.2% | 0.2% | 0.2% | 0.4% | 0.3% | 0.3% | 0.3% |
| OREGON | | | | | | | | | | | |
| Total Awards | 0.7% | 0.7% | 0.7% | 0.7% | 0.7% | 0.7% | 0.7% | 0.6% | 0.8% | 0.8% | 0.7% |
| No. of Awards | 0.9% | 0.9% | 0.9% | 0.9% | 0.9% | 0.9% | 0.9% | 0.9% | 1.0% | 1.1% | 0.9% |
| PENNSYLVANIA | | | | | | | | | | | |
| Total Awards | 6.4% | 6.6% | 7.1% | 7.5% | 7.6% | 7.4% | 8.0% | 7.8% | 8.1% | 8.3% | 7.6% |
| No. of Awards | 6.4% | 6.5% | 6.8% | 7.0% | 7.2% | 7.5% | 7.9% | 8.0% | 8.2% | 8.3% | 7.4% |
| RHODE ISLAND | | | | | | | | | | | |
| Total Awards | 0.4% | 0.3% | 0.3% | 0.3% | 0.3% | 0.3% | 0.3% | 0.3% | 0.4% | 0.3% | 0.3% |
| No. of Awards | 0.4% | 0.4% | 0.4% | 0.3% | 0.3% | 0.4% | 0.4% | 0.4% | 0.4% | 0.4% | 0.4% |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SOUTH CAROLINA | | | | | | | | | | | |
| Total Awards | 0.4% | 0.4% | 0.5% | 0.4% | 0.4% | 0.5% | 0.5% | 0.6% | 0.6% | 0.6% | 0.5% |
| No. of Awards | 0.6% | 0.6% | 0.7% | 0.6% | 0.6% | 0.7% | 0.7% | 0.7% | 0.6% | 0.7% | 0.6% |
| SOUTH DAKOTA | | | | | | | | | | | |
| Total Awards | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| No. of Awards | 0.1% | 0.1% | 0.1% | 0.1% | 0.0% | 0.1% | 0.0% | 0.0% | 0.1% | 0.1% | 0.1% |
| TENNESSEE | | | | | | | | | | | |
| Total Awards | 2.3% | 2.4% | 2.4% | 2.3% | 2.3% | 2.1% | 2.2% | 2.2% | 2.2% | 2.1% | 2.2% |
| No. of Awards | 2.3% | 2.4% | 2.5% | 2.4% | 2.3% | 2.3% | 2.3% | 2.3% | 2.3% | 2.4% | 2.4% |
| TEXAS | | | | | | | | | | | |
| Total Awards | 5.8% | 5.7% | 5.8% | 5.7% | 6.0% | 6.1% | 6.0% | 6.0% | 5.9% | 6.1% | 5.9% |
| No. of Awards | 6.7% | 6.6% | 6.6% | 6.5% | 6.6% | 6.5% | 6.5% | 6.3% | 6.4% | 6.5% | 6.5% |
| UTAH | | | | | | | | | | | |
| Total Awards | 1.0% | 1.0% | 1.0% | 1.0% | 0.9% | 0.9% | 1.1% | 0.9% | 1.0% | 0.9% | 1.0% |
| No. of Awards | 1.0% | 1.0% | 1.1% | 1.1% | 1.1% | 1.0% | 1.0% | 1.0% | 1.0% | 0.9% | 1.0% |
| VERMONT | | | | | | | | | | | |
| Total Awards | 0.7% | 0.7% | 0.8% | 0.6% | 0.6% | 0.5% | 0.5% | 0.5% | 0.5% | 0.5% | 0.6% |
| No. of Awards | 0.8% | 0.8% | 0.8% | 0.7% | 0.7% | 0.6% | 0.6% | 0.6% | 0.5% | 0.5% | 0.6% |
| VIRGINIA | | | | | | | | | | | |
| Total Awards | 2.1% | 2.1% | 2.1% | 2.2% | 2.1% | 1.9% | 1.9% | 1.8% | 1.8% | 1.8% | 1.9% |
| No. of Awards | 2.5% | 2.4% | 2.4% | 2.4% | 2.5% | 2.3% | 2.3% | 2.2% | 2.2% | 2.3% | 2.3% |
| WASHINGTON | | | | | | | | | | | |
| Total Awards | 2.9% | 3.1% | 3.1% | 2.9% | 2.8% | 2.9% | 3.0% | 2.9% | 2.9% | 2.9% | 2.9% |
| No. of Awards | 2.5% | 2.6% | 2.6% | 2.5% | 2.5% | 2.7% | 2.9% | 2.9% | 2.9% | 2.7% | 2.7% |
| WEST VIRGINIA | | | | | | | | | | | |
| Total Awards | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% |
| No. of Awards | 0.1% | 0.2% | 0.1% | 0.2% | 0.2% | 0.2% | 0.1% | 0.2% | 0.2% | 0.2% | 0.2% |
| WISCONSIN | | | | | | | | | | | |
| Total Awards | 2.0% | 2.0% | 2.0% | 2.0% | 2.1% | 2.0% | 2.1% | 2.1% | 2.0% | 2.0% | 2.0% |
| No. of Awards | 2.2% | 2.3% | 2.2% | 2.3% | 2.3% | 2.1% | 2.3% | 2.3% | 2.2% | 2.3% | 2.3% |
| U. S. TOTAL | | | | | | | | | | | |
| Total Awards | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |
| No. of Awards | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |

*Awards include research and non-research awards. Alaska, Delaware, Idaho, Maine, Montana and Wyoming have no medical school.

SOURCE: Data provided by the Office of Reports and Analysis, Office of Extramural Research, National Institutes of Health, Bethesda, MD, August 1999.

Appendix E

PRIVATE BIOTECHNOLOGY AND PHARMACEUTICAL COMPANIES IN PENNSYLVANIA

3-DIMENSIONAL PHARMACEUTICALS, INC., Exton

ABSORPTION SYSTEMS, INC., Exton

ADOLOR, INC., Malvern

ANNOVIS, INC., Philadelphia

APOLLON, INC., Malvern

ARNOSTI CONSULTING, INC., Chadds Ford

AUTOMATED CELL TECHNOLOGIES, INC., Pittsburgh

AUXILIUMA2

AVENTIS GENCELL

AVENTIS PASTEUR, Swiftwater

AVITECH DIAGNOSTICS, INC.--A SUBSIDIARY OF CENTOCOR, INC, Malvern

BAYER CORPORATION, Pittsburgh

BTG INTERNATIONAL, INC., Gulph Mills

CALIBER ASSOCIATES, Wayne

CELL PATHWAYS, INC., Horsham

CENTEON, King of Prussia

CENTOCOR, INC., Malvern

CEPHALON, INC., West Chester

COVANCE, INC., COVANCE PERIAPPROVAL SERVICES, INC, Radnor

MORRELL, BUTZ & JUNKER, INC., Pittsburgh

NEOSE TECHNOLOGIES, INC., Horsham

NEURON THERAPEUTICS, INC., Malvern

NEURONYX, INC., Malvern

ORAPHARMA, INC., Warminster

OXIS INSTRUMENTS, INC., Ivyland

PASTEUR MERIEUX CONNAUGHT - USA, Swiftwater

PITTSBURGH BIOMEDICAL DEVELOPMENT, Pittsburgh

PITTSBURGH TISSUE ENGINEERING INITIATIVE, INC., Pittsburgh

PLANTGENIX, INC., Southeastern

POLYPROBE, INC., Philadelphia

PRECISION THERAPEUTICS, INC., Pittsburgh

PREDICT, INC.

PRINCIPIA PHARMACEUTICAL CORPORATION, King of Prussia

PRINCIPIA, INC., Norristown

PROCLINICAL, INC., Phoenixville

PROTARGA, INC., Conshohocken

PURESYN, INC., Malvern

Q.E.D. TECHNOLOGIES, INC., Malvern

DELMONT LABORATORIES, Swarthmore

DEMEGEN, INC., Pittsburgh

EMEDSECURITIES, INC., Scranton

ENTOPATH, INC., Easton

FEMMEPHARMA, INC., Wayne

FISHER SCIENTIFIC, INC., Pittsburgh

GENISPHERE R&D, Bala Cynwyd

GENOVA, INC., Sharon Hill

IBAH, INC., Blue Bell

IES ENGINEERS, Blue Bell

INFLAMMATICS, INC., Malvern

INNOVATION WORKS, Pittsburgh

INSIGNIA/ESG, Philadelphia

INTEGRATED PROJECT SERVICES, Lafayette Hill

KELLY SCIENTIFIC RESOURCES, Blue Bell

LIFESENSORS, INC., Malvern

LIPTON, WEINBERGER AND HUSICK, West Chester

MAGAININ PHARMACEUTICALS, INC., Plymouth Meeting

MERCK & COMPANY, West Point

MESSAGE PHARMACEUTICALS, INC., Malvern

MOLECULAR TARGETING TECHNOLOGY, West Chester

RHONE POULENC RORER, Collegeville

RPR GENCELL, Collegeville

S.K.I.N. INCORPORATED

S.R. ONE, LIMITED, West Conshohocken

SCIGRO, INC., Malvern

SMITHKLINE BEECHAM, King of Prussia

SNAVELY ASSOCIATES, LTD., State College

TARGETED DIAGNOSTICS & THERAPEUTICS, INC., Exton

TEKTAGEN-CHARLES RIVER LABORATORIES, INC., Malvern

TISSUEINFORMATICS, INC., Pittsburgh

TOSOHAAS, Montgomeryville

VALIDATION AND PROCESS ASSOCIATES, INC., Willow Grove

VESPA LABORATORIES, Spring Mills

VIRTU STATE, LTD., North Wales

VOX MEDICIA, INC., Philadelphia

VWR SCIENTIFIC PRODUCTS, West Chester

W3 RESOURCES, INC., Coatesville

WYETH-AYERST LABORATORIES, INC., Radnor

WYETH-AYERST LABORATORIES, INC., St. Davids

WYETH-AYERST RESEARCH, Philadelphia

SOURCE: Pennsylvania Biotechnology Association, Malvern, PA; and Biotechnology Industry Organization, Washington, DC.

APPENDIX F

BIOMEDICAL RESEARCH INITIATIVES IN SELECTED OTHER STATES

| State | Sales tax benefits | Investment tax credit | Net operating loss carryforward | Job creation benefits | Local initiatives | Notable funded programs | Other |
|---|---|---|---|---|---|---|---|
| California | Exemption, 6% | 6% new equipment, 10 year carryforward; 12%, research; 24%, university research; 5%, construction of biotechnology facilities | 8 years | -- | $4 million through exemptions and waivers | -- | -- |
| Georgia | -- | 10%, R&D | 10 years | $500 to $2,500 per job for training | -- | -- | Property tax exemption |
| Maryland | -- | -- | -- | Tax credit, Maryland funds up to 50% training costs per job | -- | Challenge Investment Program/Enterprise Investment Fund $50,000 to $100,000 royalty repayment, convertible to equity. Maryland direct equity investment, $150,000 to $500,000 | -- |
| Massachusetts | Exemption, 5% | 10% to 15%, R&D, 15 year carryforward; 3%, fixed assets | 5 years | Job training credits | -- | $1 million between three incubators. Emerging Technology Fund $15 million | Manufacturing exempt from personal property tax |
| Michigan | Exemption, 6% | -- | Indefinite | 20 year tax credit | -- | -- | -- |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| New Jersey | -- | 10%, R&D | 15 years | -- | -- | Economic Development Authority and banks lend $100,000 to $3 million. Early Stage Enterprise Seed Fund lends $20,000 to $200,00 ($44 million in fund) | Technology Business Tax Transfer Program allows small businesses to sell tax credits for 75% of value. $40 million annually |
| New York | Exemption, R&D | 9%, R&D | 15 years | -- | $100 million through venture, seed, and loan capital | Centers for Advanced Technology budget $100 million annually | -- |
| North Carolina | Manufacturing exemption, 4%; reduction, 4% to 1% | 25%, to $75,000 | 5 years | -- | -- | Biotechnology Center invested $61 million; attracted $150 million | -- |

SOURCE: "A Survey of State Initiatives," Biotechnology Industry Organization, 2000; "15 States That Engineer Growth," Business Facilities, http://www.busfac.com/beta/99_10_cover.cfm, 1999; Georgia Department of Industry, Trade and Tourism; North Carolina Biotechnology Center, http://www.ncbiotech.org; "In Governor George E. Pataki's New Budget: New High-Tech and Biotech Initiatives," New York Biotechnology Association, 1999.