Final Progress Report for Research Projects Funded by Health Research Grants

Instructions: Please complete all of the items as instructed. Do not delete instructions. Do not leave any items blank; responses must be provided for all items. If your response to an item is "None", please specify "None" as your response. "Not applicable" is not an acceptable response for any of the items. There is no limit to the length of your response to any question. Responses should be single-spaced, no smaller than 12-point type. The report **must be completed using MS Word**. Submitted reports must be Word documents; they should not be converted to pdf format. Questions? Contact Health Research Program staff at 717-783-2548.

1. **Grantee Institution:** University of Pittsburgh- of the Commonwealth System of Higher Education

2. **Reporting Period (start and end date of grant award period):** 01/01/2009 – 12/31/2012

3. **Grant Contact Person (First Name, M.I., Last Name, Degrees):** Margaret C. McDonald, PhD

4. **Grant Contact Person's Telephone Number:** 412- 383-7474

5. **Grant SAP Number:** 4100047655

6. **Project Number and Title of Research Project:** 5 – Research Infrastructure: Bridgeside Point II Building Renovations

7. **Start and End Date of Research Project**: 12/17/2009 – 9/30/2010

8. **Name of Principal Investigator for the Research Project:** Arthur S. Levine, MD

9. **Research Project Expenses**.

   9(A) Please provide the total amount of health research grant funds spent on this project for the entire duration of the grant, including indirect costs and any interest earned that was spent:

   $ 3,370,718

   9(B) Provide the last names (include first initial if multiple individuals with the same last name are listed) of **all** persons who worked on this research project and were supported with health research funds. Include position titles (Principal Investigator, Graduate Assistant, Post-doctoral Fellow, etc.), percent of effort on project and total health research funds expended for the position. For multiple year projects, if percent of effort varied from year to year, report in the % of Effort column the effort by year 1, 2, 3, etc. of the project (x% Yr 1; z% Yr 2-3).

Last Name	Position Title	% of Effort on Project	Cost
None			

9(C) Provide the names of **all** persons who worked on this research project, but who *were not* supported with health research funds. Include position titles (Research Assistant, Administrative Assistant, etc.) and percent of effort on project. For multiple year projects, if percent of effort varied from year to year, report in the % of Effort column the effort by year 1, 2, 3, etc. of the project (x% Yr 1; z% Yr 2-3).

Last Name	Position Title	% of Effort on Project
Arthur S. Levine, MD	Vice Chancellor Health Sciences and Dean, School of Medicine	< 1%
Cerilli	Director, Office of Space Management	Ms. Cerilli manages the construction of multiple projects and was not assigned a percent effort on this project.

9(D) Provide a list of **all** scientific equipment purchased as part of this research grant, a short description of the value (benefit) derived by the institution from this equipment, and the cost of the equipment.

Type of Scientific Equipment	Value Derived	Cost
None		

10. Co-funding of Research Project during Health Research Grant Award Period. Did this research project receive funding from any other source during the project period when it was supported by the health research grant?

Yes__X_____ No_____

If yes, please indicate the source and amount of other funds:

University of Pittsburgh Health Sciences discretionary funds, $992,155.

11. Leveraging of Additional Funds

11(A) As a result of the health research funds provided for this research project, were you able to apply for and/or obtain funding from other sources to continue or expand the research?

Yes_____ No___X_____

If yes, please list the applications submitted (column A), the funding agency (National Institutes of Health—NIH, or other source in column B), the month and year when the

application was submitted (column C), and the amount of funds requested (column D). If you have received a notice that the grant will be funded, please indicate the amount of funds to be awarded (column E). If the grant was not funded, insert "not funded" in column E.

Do not include funding from your own institution or from CURE (tobacco settlement funds). Do not include grants submitted prior to the start date of the grant as shown in Question 2. If you list grants submitted within 1-6 months of the start date of this grant, add a statement below the table indicating how the data/results from this project were used to secure that grant.

A. Title of research project on grant application	B. Funding agency (check those that apply)	C. Month and Year Submitted	D. Amount of funds requested:	E. Amount of funds to be awarded:
None	☐NIH ☐ Other federal (specify:_____) ☐ Nonfederal source (specify:_)		$	$

11(B) Are you planning to apply for additional funding in the future to continue or expand the research?

Yes_____ No___X_____

If yes, please describe your plans:

12. Future of Research Project. What are the future plans for this research project?

There are no future plans for this project.

13. New Investigator Training and Development. Did students participate in project supported internships or graduate or post-graduate training for at least one semester or one summer?

Yes_____ No___X_____

If yes, how many students? Please specify in the tables below:

	Undergraduate	Masters	Pre-doc	Post-doc
Male				
Female				
Unknown				
Total				

	Undergraduate	Masters	Pre-doc	Post-doc
Hispanic				
Non-Hispanic				
Unknown				
Total				

	Undergraduate	Masters	Pre-doc	Post-doc
White				
Black				
Asian				
Other				
Unknown				
Total				

14. Recruitment of Out-of–State Researchers. Did you bring researchers into Pennsylvania to carry out this research project?

Yes_____ No___X_____

If yes, please list the name and degree of each researcher and his/her previous affiliation:

15. Impact on Research Capacity and Quality. Did the health research project enhance the quality and/or capacity of research at your institution?

Yes___X_____ No_____

If yes, describe how improvements in infrastructure, the addition of new investigators, and other resources have led to more and better research.

The improvements in infrastructure led to the expansion of our operation by 160,000 square feet. By establishing this additional space, the Department of Orthopaedic Surgery, the Department of Psychiatry, the Department of Microbiology and Molecular Genetics, and the McGowan Institute for Regenerative Medicine were able to expand their research programs, recruit additional faculty members, and accommodate researchers' changing needs. From 2010 to 2012 the expansion has created 154 jobs among the departments.

16. Collaboration, business and community involvement.

16(A) Did the health research funds lead to collaboration with research partners outside of your institution (e.g., entire university, entire hospital system)?

Yes_____ No__X_____

If yes, please describe the collaborations:

16(B) Did the research project result in commercial development of any research products?

Yes_____ No__X_____

If yes, please describe commercial development activities that resulted from the research project:

16(C) Did the research lead to new involvement with the community?

Yes_____ No__X_____

If yes, please describe involvement with community groups that resulted from the research project:

17. Progress in Achieving Research Goals, Objectives and Aims.

List the project goals, objectives and specific aims (as contained in the grant agreement). Summarize the progress made in achieving these goals, objectives and aims for the period that the project was funded (i.e., from project start date through end date). Indicate whether or not each goal/objective/aim was achieved; if something was not achieved, note the reasons why. Describe the methods used. If changes were made to the research goals/objectives/aims, methods, design or timeline since the original grant application was submitted, please describe the changes. Provide detailed results of the project. Include evidence of the data that was generated and analyzed, and provide tables, graphs, and figures of the data. List published abstracts, poster presentations and scientific meeting presentations at the end of the summary of progress; peer-reviewed publications should be listed under item 20.

This response should be a DETAILED report of the methods and findings. It is not sufficient to state that the work was completed. Insufficient information may result in an unfavorable performance review, which may jeopardize future funding. If research findings are pending publication you must still include enough detail for the expert peer reviewers to evaluate the progress during the course of the project.

Health research grants funded under the Tobacco Settlement Act will be evaluated via a performance review by an expert panel of researchers and clinicians who will assess project work using this Final Progress Report, all project Annual Reports and the project's strategic plan. After the final performance review of each project is complete, approximately 12-16 months after the end of the grant, this Final Progress Report, as well as the Final Performance Review Report containing the comments of the expert review panel, and the grantee's written response to the Final Performance Review Report, will be posted on the CURE Web site.

There is no limit to the length of your response. Responses must be single-spaced below, no smaller than 12-point type. If you cut and paste text from a publication, be sure

symbols print properly, e.g., the Greek symbol for alpha (α) and beta (ß) should not print as boxes (□) and include the appropriate citation(s). DO NOT DELETE THESE INSTRUCTIONS.

The School of Medicine leased approximately 160,000 square feet of research laboratory and office space in the Bridgeside Point II (BSPII) office building located at 450 Technology Drive, Pittsburgh, Pennsylvania 15219. The facility houses School of Medicine research activities. Specifically, the Department of Orthopaedic Surgery, the Department of Psychiatry, the McGowan Institute for Regenerative Medicine (MIRM), and the Department of Microbiology and Molecular Genetics occupy space on the second, third, fourth, and fifth floors, with a vivarium on the first floor as a shared core facility used by all occupants.

The Department of Orthopaedic Surgery occupies 14,196 square feet that houses the Stem Cell Research Center (SCRC), under the direction of Dr. Johnny Huard, and the newly created Center for Cellular and Molecular Engineering. The faculty and staff of the SCRC are using cutting-edge technology in cellular techniques, observation, and analysis to develop new cellular therapies. Musculosketal injuries and illnesses, including muscular dystrophy, bone fractures, nervous system conduction pathways, cardiac repair, and vascular blockages are of particular interest to SCRC researchers. Each member of the center is focused on the translation of his/her research from the laboratory into the clinic.

The Center for Cellular and Molecular Engineering is under the direction of Dr. Rocky Tuan. For more than 30 years Dr. Tuan has studied the workings of the musculoskeletal system and its diseases, including cartilage development and repair, cell signaling and matrix biochemistry, stem cell biology, and many other orthopedically relevant topics. The aim of the Center for Cellular and Molecular Engineering is to develop the knowledge base and technical know-how for restoration of organ function by integrating cellular, molecular, and engineering principles.

Collectively, the researchers who use this space are funded in excess of $540,000 of indirect cost recovery and support from the Department of Orthopaedic Surgery and from startup packages funded by the Senior Vice Chancellor's reserves to support the rent at the new facility.

The Department of Psychiatry occupies approximately 15,360 square feet of leased space on the second floor of Bridgeside Point 2 (BSPII) to accommodate the laboratories of six new faculty members who were recruited to conduct translational and basic research on neural substrates and the neurodevelopmental mechanisms of major brain disorders, pre-requisites for developing much needed new diagnostic methods and therapeutic approaches for psychiatric illnesses.

The McGowan Institute for Regenerative Medicine was established by the University of Pittsburgh School of Medicine and UPMC in July 2001. Regenerative medicine uses a variety of techniques to reestablish tissue and organ function impaired by disease, trauma, or congenital abnormalities. The aim of the McGowan Institute is to foster the research, development, training, clinical translation, and commercialization of technologies related to regenerative medicine. To accomplish this mission and grow as planned, the McGowan Institute needed additional laboratory and office space to house biomedical scientists and engineers. Co-location of a variety

of disciplines facilitates collaboration on federally funded grants in regenerative medicine and will aid future funding success. The institute currently occupies approximately 34,000 square feet of leased space on the third floor of BSPII to accommodate new growth. Collectively, the researchers who use this space are funded in excess of $2 million of indirect cost recovery and $1 million from UPMC to support the rent at the new facility.

The Department of Microbiology and Molecular Genetics (MMG) is a basic science department in the School of Medicine. MMG currently occupies approximately 67,544 square feet (floors 4 and 5) of research laboratory and office space in BSPII. Collectively, the researchers who use this space generate in excess of $9 million through indirect cost recovery to support the rent at the new facility.

The first floor of Bridgeside Point II consists of a 29,000 square foot vivarium managed by the Division of Laboratory Animal Resources (DLAR) to support the research activities of the Departments of Orthopaedic Surgery, Psychiatry, MMG and the McGowan Institute..

18. Extent of Clinical Activities Initiated and Completed. Items 18(A) and 18(B) should be completed for all research projects. If the project was restricted to secondary analysis of clinical data or data analysis of clinical research, then responses to 18(A) and 18(B) should be "No."

18(A) Did you initiate a study that involved the testing of treatment, prevention or diagnostic procedures on human subjects?

_____Yes
__X___No

18(B) Did you complete a study that involved the testing of treatment, prevention or diagnostic procedures on human subjects?

_____Yes
__X__No

If "Yes" to either 18(A) or 18(B), items 18(C) – (F) must also be completed. (Do NOT complete 18(C-F) if 18(A) and 18(B) are both "No.")

18(C) How many hospital and health care professionals were involved in the research project?

_____Number of hospital and health care professionals involved in the research project

18(D) How many subjects were included in the study compared to targeted goals?

_____Number of subjects originally targeted to be included in the study
_____Number of subjects enrolled in the study

Note: Studies that fall dramatically short on recruitment are encouraged to provide the details of their recruitment efforts in Item 17, Progress in Achieving Research Goals, Objectives and Aims. For example, the number of eligible subjects approached, the number that refused to participate and the reasons for refusal. Without this information it is difficult to discern whether eligibility criteria were too restrictive or the study simply did not appeal to subjects.

18(E) How many subjects were enrolled in the study by gender, ethnicity and race?

Gender:
_____Males
_____Females
_____Unknown

Ethnicity:
_____Latinos or Hispanics
_____Not Latinos or Hispanics
_____Unknown

Race:
_____American Indian or Alaska Native
_____Asian
_____Blacks or African American
_____Native Hawaiian or Other Pacific Islander
_____White
_____Other, specify:_____
_____Unknown

18(F) Where was the research study conducted? (List the county where the research study was conducted. If the treatment, prevention and diagnostic tests were offered in more than one county, list all of the counties where the research study was conducted.)

19. Human Embryonic Stem Cell Research. Item 19(A) should be completed for all research projects. If the research project involved human embryonic stem cells, items 19(B) and 19(C) must also be completed.

19(A) Did this project involve, in any capacity, human embryonic stem cells?
_____Yes
__X _ No

19(B) Were these stem cell lines NIH-approved lines that were derived outside of Pennsylvania?
_____Yes
_____ No

19(C) Please describe how this project involved human embryonic stem cells:

20. Articles Submitted to Peer-Reviewed Publications.

20(A) Identify all publications that resulted from the research performed during the funding period and that have been submitted to peer-reviewed publications. Do not list journal abstracts or presentations at professional meetings; abstract and meeting presentations should be listed at the end of item 17. **Include only those publications that acknowledge the Pennsylvania Department of Health as a funding source** (as required in the grant agreement). List the title of the journal article, the authors, the name of the peer-reviewed publication, the month and year when it was submitted, and the status of publication (submitted for publication, accepted for publication or published.). Submit an electronic copy of each publication or paper submitted for publication, listed in the table, in a PDF version 5.0.5 (or greater) format, 1,200 dpi. Filenames for each publication should include the number of the research project, the last name of the PI, the number of the publication and an abbreviated research project title. For example, if you submit two publications for PI Smith for the "Cognition and MRI in Older Adults" research project (Project 1), and two publications for PI Zhang for the "Lung Cancer" research project (Project 3), the filenames should be:

Project 1 – Smith – Publication 1 – Cognition and MRI
Project 1 – Smith – Publication 2 – Cognition and MRI
Project 3 – Zhang – Publication 1 – Lung Cancer
Project 3 – Zhang – Publication 2 – Lung Cancer

If the publication is not available electronically, provide 5 paper copies of the publication.

Note: The grant agreement requires that recipients acknowledge the Pennsylvania Department of Health funding in all publications. Please ensure that all publications listed acknowledge the Department of Health funding. If a publication does not acknowledge the funding from the Commonwealth, do not list the publication.

Title of Journal Article:	Authors:	Name of Peer-reviewed Publication:	Month and Year Submitted:	Publication Status (check appropriate box below):
1. None				☐Submitted ☐Accepted ☐Published

20(B) Based on this project, are you planning to submit articles to peer-reviewed publications in the future?

Yes_____ No__X_____

If yes, please describe your plans:

21. Changes in Outcome, Impact and Effectiveness Attributable to the Research Project. Describe the outcome, impact, and effectiveness of the research project by summarizing its impact on the incidence of disease, death from disease, stage of disease at time of diagnosis, or other relevant measures of outcome, impact or effectiveness of the research project. If there were no changes, insert "None"; do not use "Not applicable." Responses must be single-spaced below, and no smaller than 12-point type. DO NOT DELETE THESE INSTRUCTIONS. There is no limit to the length of your response.

None

22. Major Discoveries, New Drugs, and New Approaches for Prevention Diagnosis and Treatment. Describe major discoveries, new drugs, and new approaches for prevention, diagnosis and treatment that are attributable to the completed research project. If there were no major discoveries, drugs or approaches, insert "None"; do not use "Not applicable." Responses must be single-spaced below, and no smaller than 12-point type. DO NOT DELETE THESE INSTRUCTIONS. There is no limit to the length of your response.

None

23. Inventions, Patents and Commercial Development Opportunities.

23(A) Were any inventions, which may be patentable or otherwise protectable under Title 35 of the United States Code, conceived or first actually reduced to practice in the performance of work under this health research grant? Yes_____ No___X____

If "Yes" to 23(A), complete items a – g below for each invention. (Do NOT complete items a - g if 23(A) is "No.")

a. Title of Invention:

b. Name of Inventor(s):

c. Technical Description of Invention (describe nature, purpose, operation and physical, chemical, biological or electrical characteristics of the invention):

d. Was a patent filed for the invention conceived or first actually reduced to practice in the performance of work under this health research grant?
Yes_____ No____

If yes, indicate date patent was filed:

e. Was a patent issued for the invention conceived or first actually reduced to practice in the performance of work under this health research grant?
Yes_____ No____

If yes, indicate number of patent, title and date issued:
Patent number:
Title of patent:
Date issued:

f. Were any licenses granted for the patent obtained as a result of work performed under this health research grant? Yes_____ No___

If yes, how many licenses were granted?_____

g. Were any commercial development activities taken to develop the invention into a commercial product or service for manufacture or sale? Yes___ No___

If yes, describe the commercial development activities:

23(B) Based on the results of this project, are you planning to file for any licenses or patents, or undertake any commercial development opportunities in the future?

Yes_____ No_____X_____

If yes, please describe your plans:

24. Key Investigator Qualifications. Briefly describe the education, research interests and experience and professional commitments of the Principal Investigator and all other key investigators. In place of narrative you may insert the NIH biosketch form here; however, please limit each biosketch to 1-2 pages. *For Nonformula grants only – include information for only those key investigators whose biosketches were not included in the original grant application.*

NAME: **Arthur Samuel Levine**
PRESENT POSITION: Senior Vice Chancellor for the Health Sciences and Dean, School of Medicine, University of Pittsburgh, Pittsburgh, PA

EDUCATION:
1954 The Windsor Mountain School, Lenox, MA
1958 A.B., Columbia College
1958-1960 Columbia University, Graduate Faculties
1964 M.D., Rosalind Franklin University of Medicine and Science (formerly Chicago Medical School)
SPECIALTY BOARD CERTIFICATION:
American Board of Pediatrics, 1969;
American Board of Pediatric Hematology-Oncology, 1976

ACADEMIC APPOINTMENTS:
Professor of Medicine and Professor of Microbiology and Molecular Genetics,
University of Pittsburgh School of Medicine, Pittsburgh, PA (1998-present)
Clinical Professor of Medicine and Pediatrics, Georgetown University, School of Medicine, Washington, D. C. (1975-1998)
Clinical Professor of Pediatrics, Uniformed Services University of the Health Sciences, Bethesda, Maryland (1983-1998)

RESEARCH INTERESTS:
Molecular Mechanisms of DNA Repair, Replication, and Mutagenesis (Current)
Molecular Genetics of DNA and RNA Tumor Viruses (1967-1982)
Clinical Research (1967-1982): Oncology, Infectious Diseases, the Doctor-Patient Relation

COMMITTEES, BOARDS, AND OTHER OFFICES:
NCI Medical Education Committee (1970-1974)
NCI Chemotherapy Review Committee (1971-1975)
NIH Biohazards Committee (1975-1978)
NCI Interferon Working Group (1976-1980)
National Cancer Advisory Board Site Visit Committee, Karolinska Institute, Stockholm (Chairman, 1976)
NCI Working Group on Education and Training (1977-1979)
American Cancer Society Program Organizing Committee for National Conferences (1978, 1980, 1982)
NCI Program Planning and Evaluation Group (1979-1982)
NIH Committee on Clinical Center Costs (1982-1983)
NIH Working Group on AIDS (1982-1985)
NIH Education Committee (1982-1995) (Chairman, 1988-1995)
NIH Board of Scientific Directors (1982-1998)
NIH Financial Management Advisory Committee (1983-1984)
Search Committee for Scientific Director, National Institute of Dental Research (1985)
Search Committee for Director, National Center for Research Resources, NIH (1985)
NIH Animal Research Accreditation Committee (1985-1993)

NIH Productivity Committee (1985-1988)
Search Committee for Executive Officer, the Warren Grant Magnuson Clinical Center, NIH (1985)
NIH Steering Committee on the Domestic and Visiting Fellow Programs (1986-1990)
NIH Fogarty Scholars Advisory Panel (1986-1990)
Pediatric Scientist Training Program Committee (Association of Medical School Pediatric Department Chairmen) (1987-1998)
Search Committee for Chairman, Department of Pediatrics, Georgetown University School of Medicine (1987)
PHS "Revitalization" Working Group on Research Careers (1987-1988)
NIH Procurement Advisory Committee (1988-1992)
Chairman, NIH "Research Day" Organizing Committee (1988) (1998)
Search Committee for Director, Division of Procurement, NIH (1988)
Consultant, Library of Congress (1989-)
NIH Office of Research Services Advisory Committee (1989-1993) (Chairman, 1992-1993)
Advisory Committee on the Clinical Center Infrastructure, NIH (1989-1994)
NIH Strategic Planning Team (1991-1992)
NIH Senior Biomedical Research Service Working Group (1990-1991)
PHS Advisory Committee on the Research Officers' Group (1991-1998)
Search Committee for Director, Office of Research Services, NIH (1992)
Scientific Advisory Committee, The Children's Memorial Institute for Education and Research, Northwestern University, Chicago (1992-1998) (Chairman, 1993-1998)
Scientific Advisory Committee, Istituto Dell'Immacolata, Rome (1992-1995)
Search Committee for Scientific Director, National Center for Human Genome Research (1993)
Search Committee for Deputy Director for Management, Clinical Center, NIH (1994) (Chairman)
Clinical Center Advisory Board (1993-1995)
Executive Working Group on Revitalization of the NIH Intramural Program (Chair, Writing Committee) (1993-1994)
NIH Central Services Review Committee (1994-1996)
Search Committee: NIEHS Scientific Director (1995)
Search Committee: NIH Bioethics Chief (1995)
NIH SES/SSS Performance Review Board (1995-1996)
NIH Committee on Shared Resources (1996-1998) (Co-chairman)
Chairman, Search Committee for Director, Division of Basic Sciences, NCI (1997)
Advisory Board, International Molecular Biology Network for Asia-Pacific Rim (1997-)
NIH Fogarty Scholars Review Panel (1998)
Board of Directors, Children's Research Center of Michigan (1998)
Search Committee: NIDCD Scientific Director (1998)
Board of Directors, MPC Research Corporation, Carnegie Mellon University and University of Pittsburgh (1998-)
Professional Health Care Provider Review Committee, University Health Center of Pittsburgh, Chairman (1998-2002)
Board of Directors, University of Pittsburgh Medical Center (1998-), Executive Committee (1998-2011), Health Ventures Committee (2005-2006), Investment Committee (2002-),

Inclusion & Diversity Committee (2011-)
Joint Board of Directors, UPMC Presbyterian and UPMC Shadyside Hospitals (1998-), Executive Committee (1998-), Physician Services Division Committee (1998-)
Executive Advisory Board, Pittsburgh Clinical Research Network (1998-2002)
Board of Directors, Diversified Services, Inc., University of Pittsburgh Medical Center (1998-2006)
Board of Directors, Magee-Womens Hospital (1999-), Magee-Womens Research Institute Leadership Committee (2004-), Magee-Womens Hospital Strategic Planning Committee (2004-)
Board of Directors, Eye and Ear Foundation (1999-)
Board of Trustees, Children's Hospital of Pittsburgh (1999-), Chairman, Research Strategic Planning Committee (1999)
Board of Directors, University of Pittsburgh Physicians, Inc. (1999-), Executive Committee (1999-), Compliance Advisory Committee (1999-2002)
Search Committee: Director, Division of Basic Sciences, National Cancer Institute (1999)
Board of Directors, Foundation for Advanced Education in the Sciences, National Institutes of Health (1999-2008), Nominating Committee (2007-2008)
Working Group on Biomedical Research, Joint State Government Commission, Commonwealth of Pennsylvania (1999-2000)
Distinguished Research Award Review Committee, Association of American Medical Colleges, (2000-2002); Chairman (2001)
Board of Directors, Pittsburgh Technology Council (2000-2003); Member, Public Policy Committee (2001-2003)
Board of Directors (Member At-Large), Pittsburgh Tissue Engineering Initiative, Inc. (2000-)
Scientific Advisory Board, Science and Technology Center, Carnegie Mellon University(2000-)
Scientific Advisory Board, Juvenile Diabetes Research Foundation International (2001-2004)
International Advisory Committee on Research, Aga Khan University, Pakistan (2001-2005)
Board of Directors, Children's Memorial Research Center, Northwestern University, Chicago,IL (2001-2008), External Advisory Committee (2004)
Health Research Advisory Committee, Pennsylvania Department of Health (2001-)
Board of Directors, Pittsburgh Lifesciences Greenhouse (2001-; Scientific Infrastructure Investment Committee, 2003-; Audit Committee, 2007- ; Secretary-Treasurer, 2007-)
Scientific Advisory Board, VivoQuest, Inc. (2002-2005)
Nominating Committee, Council of Deans, Association of American Medical Colleges (2003-2004)
Council on Research and Science, Association of Academic Health Centers (2003-)
Scientific Advisory Board, Stemnion, Inc. (2004-2005; 2007-)
Scientific Advisory Board, Rheogene, Inc. (2004-2007)
Board of Directors, Pittsburgh Symphony (2005-2010); Board of Advisors (2004-2005)
Nominating Committee, Association of Academic Health Centers (2005)
Advisory Board, Program Committee, Pittsburgh Chamber Music Society (2005-)
Board Liaison to Vice Presidents for Research Executive Leadership Group, Association of Academic Health Centers (2006-2008)
Scientific Director, Ri.MED Foundation (2006-)
Scientific Director, Biomedical Research and Biotechnology Center, University of Pittsburgh Medical Center-Italy (2006-)

NIH Special Action Committee, Association of American Medical Colleges (2007-present)
Board of Scientific Counselors, National Center for Biotechnology Information, National Library Of Medicine (2007-2012; Chair 2010-2012)
Systematic Review Working Group on Comparative Effectiveness Research and Clinical Practice, National Center for Biotechnology Information, National Library of Medicine (Chair, 2010-)

EDITORSHIPS:
Associate Editor, Journal of the National Cancer Institute (1976-1986)
Associate Editor, American Journal of Pediatric Hematology-Oncology (1982-1986)
Associate Editor, Journal of Biological Regulation (1987-1990)
Editor-in-Chief, The New Biologist (1988-1992)