



Iktomi, a stainless steel and glass sculpture by alumna Alice Smith, MFA '05, honors Dr. William R. Keast, president of Wayne State University from 1965 to 1971. The sculpture's name comes from a West African folktale and means "teacher of wisdom."

Criterion 4: Acquisition, Discovery, and Application of Knowledge

The organization promotes a life of learning for its faculty, administration, staff, and students by fostering and promoting inquiry, creativity, practice, and social responsibility in ways consistent with its mission.



Over the past 25 years, Wayne State University has become one of the leading research universities in the United States. The new Carnegie Classification for Wayne State is as follows:

- Undergraduate Instructional Program:
Prof+A&S/HGC: Professions plus arts and sciences, high graduate coexistence
- Graduate Instructional Program:
CompDoc/MedVet: Comprehensive doctoral with medical/veterinary
- Basic:
RU/VH: Research Universities (very high research activity)

Other organizations such as the National Science Foundation have provided ranks for research universities. WSU ranked 64th among all universities in 2003 and 68th in 2004. Although 2005 NSF rankings are not yet publicly available, the total research expenditures submitted to NSF fell slightly from 2004 values, from \$226.85 million to \$226.33 million.

The importance of WSU's research mission can be viewed from several perspectives:

- Research creates new knowledge that solves critical real-world problems.

- Quality graduate programs are built on strong research and scholarship.
- Strong research programs provide state, national, and international recognition for the University and are key to recruiting faculty and students at the graduate and undergraduate levels who come for the academic reputation of the University.
- Research is the bridge between access and excellence. WSU provides access to a high-quality education for our local citizens. This education once could be provided without a strong research profile, but this is no longer possible given the demands of the new knowledge-based economy.
- The economic impact that the University has on the city, region, and state is heavily dependent on research conducted at the University.
- Research provides the new discoveries/patents that lead to start-up companies or licenses for the University.
- Research provides highly skilled and trained individuals for the workforce.
- Research provides opportunities for those in the workforce to renew or improve their skills and knowledge.

- Research provides consultants for industry.
- Research provides approximately \$160 million in “external income,” two-thirds of which provides salary for staff and students.

Most significantly, research is critical to attract and retain high-quality faculty who provide quality educational programs and promote student learning at all levels. Illinois State Representative Kevin Joyce, vice chairman of the Appropriations Higher Education Subcommittee for that state, argued in 2003 that research funds “help keep top-notch faculty members, who do a good job of educating undergraduates” (*Chronicle of Higher Education*; May 2, 2003). In fact, Paula Krebs, professor of English at Wheaton College, contends that “undergraduate, student-centered colleges and universities work best when they have a solid research culture that puts faculty publishing on the front burner” (*Chronicle of Higher Education*; September 23, 2005). Faculty who are not engaged in research are unlikely to see themselves as part of a larger disciplinary and scholarly community and unlikely to draw upon the resources that connection provides. For instance, faculty members who conduct research attend conferences and keep up to date in their fields. Stronger teaching occurs when the latest ideas, readings, and projects can be brought into the classroom and connected to real-world problems. In short, according to Krebs, “being better in the classroom is a welcome by-product of doing good research.” The high-quality research faculty at WSU sets us apart from many schools in the local area such as Oakland University, Eastern Michigan University, University of Michigan at Dearborn, and community colleges more generally, which may appear to be alternatives to students seeking postsecondary education in the Detroit metropolitan area.

Our goal is to provide high-quality research-based programs that allow students to acquire cutting-edge knowledge that they can apply to solving real-world problems. The challenge faced is fundamental to Wayne State’s position as a nationally recognized research institution. Our challenge is to secure adequate funding for these programs in the face of declines in both state appropriations to higher education and federal funding for research. In the next sections, we outline initiatives that support research (e.g., Wayne First capital campaign,

Graduate Enhancement Programs, partnerships with industry, expansion of TechTown), along with programs designed to allow faculty to better compete for grant funding.



4a. **The organization demonstrates through the actions of its board, administrators, students, faculty and staff that it values a life of learning.**

In this section, major research accomplishments and challenges at WSU are delineated. We explore how commitment to a life of learning benefits undergraduate and graduate education. We identify strengths and needs for continued support for inquiry activities at WSU.

A History of Research and Application to Improve Quality of Life

Wayne State is a national research university with an urban teaching and service mission. As an urban university, it makes a special commitment to the Detroit metropolitan area to foster teaching and research programs that educate the future leaders — individuals who will live and work in this region and carry on the WSU tradition of discovering and applying new knowledge to improve the lives of all citizens. We strive to instill a commitment to a life of learning in our students, faculty and staff. This commitment must recognize the challenges of embracing technological innovation in an increasingly global and diverse society while at the same time embracing the social mandate to proceed in a responsible and humane manner. A key factor in our approach to engage students in this commitment is the expectation that faculty and staff will serve as positive role models for undergraduates as well as graduate students by demonstrating their own commitment to scholarship.

Historically, inquiry, creativity and practice at WSU were seen as a continuum long before the term “translational research” became fashionable. A sampling of discoveries and accomplishments since the 1950s illustrates this point:

- Since the 1950s, head injury research at WSU has influenced automobile design and standards for sports helmets and equipment.
- The first successful open heart operation was performed in 1952 at Harper Hospital in Detroit, using a mechanical pump developed by WSU researchers to support blood circulation while a mitral valve was repaired.
- In the mid-1960s, WSU researchers were involved in the initial discovery of AZT, the compound that later became an effective drug therapy for AIDS.
- In the 1970s and '80s, WSU researchers developed the standard therapies used today for head, neck, and rectal cancers.
- In 1973, WSU researchers developed MCF-7, the first human breast cancer cell line, leading to the recognition of the importance of the estrogen-receptor in breast cancer and the development of the drug Tamoxifen.
- WSU physicians developed the first effective treatment for preventing recurrent strokes in patients with sickle cell anemia in 1976.
- In 1978, WSU ophthalmologists at the Kresge Eye Institute were the first to perform radial keratotomy to correct nearsightedness.
- In 1988, WSU physicians were the first to repair a newborn's congenital abdominal wall defect immediately after delivery.
- In 1995, WSU physicians performed the world's first successful surgery and bone-marrow transplant on a fetus. In the same year, the first artificial pump lined with endothelial cells was created and functioned successfully as a blood pump in the arterial circulation.
- WSU's research in fetal biology and high-risk pregnancy was instrumental in bringing the NIH Perinatology Research Branch to our campus. In 2002, the School of Medicine was awarded a 10-year, multi-million dollar contract to support this branch of the National Institutes of Health to conduct research on maternal and infant health and diseases.

The tradition of cutting-edge research and technology development continues with increasing emphasis on technology transfer and economic development. Some current examples:

- Jerome Horwitz (School of Medicine), inventor of AZT, has licensed a new class of anti-cancer drugs.
- Sean Wu (College of Engineering) has developed, patented, and licensed a technology allowing users to actually see where unwanted sound originates and how it travels through space and time. The resulting start-up company is called SenSound, LLC.
- Phil Cunningham (College of Liberal Arts and Sciences) has developed several new bacterial genetic mutation technologies that allow rapid identification of any mutation in antibiotic drug targets that might produce an antibiotic-resistant bacterial strain. The start-up company that has developed is called RiboNovix, Inc.
- Greg Auner (College of Engineering) is developing novel materials, methods and prototype devices using smart sensors and integrated microsystems for a variety of applications, from automotive, environmental and biomedical to advances in energy, communications, and aerospace technology.
- King Hay Yang (College of Engineering) is developing computerized models of the effects of car crashes on the human body. This ultimately will save millions of dollars in crash testing, improve vehicle safety, and decrease injuries.
- Richard Spears (School of Medicine) has developed a system for super-oxygenating blood after a heart attack. This system is in clinical trials at WSU, and a start-up company, TherOx, has been initiated.
- Robert Thomas (College of Liberal Arts and Sciences) has developed a technology that can detect the tiniest of cracks in practically any material, even if the defects are buried beneath a surface that has been coated, patched or painted. It can check for cracked engine blocks, damaged turbine blades, defects in pipelines, flaws in wheels, and cracks in airplanes, to name a few. The Better

World Project of the Association of University Technology Managers chose this technology as one of “25 Innovations that Changed the World” in 2006.

Commitment to Free Inquiry

The mission statements of the University and its academic units demonstrate our commitment to:

- Lifelong utilization of knowledge and development of new knowledge;
- Integration of teaching, research and scholarship in order to instill commitment to lifelong learning in our students;
- Participation of students, faculty and staff in the learning community;
- Research and application of research in the urban setting;
- Preparation of students, faculty and staff to utilize technological innovation in a responsible manner; and
- Adherence to the highest standards of ethical behavior and academic freedom.

The University’s 2006-2011 Strategic Plan, approved by the Board of Governors and widely disseminated through print and electronic media, makes it clear that the University supports and encourages free inquiry by faculty, staff, and students. The Strategic Plan is discussed in detail under Criterion 1. Likewise, the Strategic Plans of all the colleges and schools point to the importance of ongoing research and scholarship in meeting their respective missions.

Integration of Teaching, Research, and Application

WSU recognizes the need to engage students in research early in their college careers. Participation in laboratory-based courses, research labs, and projects provides students with an understanding of the skills, attitudes and intellectual discipline required to design, perform and analyze high-quality and ethical research studies. Research exposure also provides students with a better understanding of the challenges encountered in rapidly emerging areas, and how scientists must take into account the scientific,

ethical and global concerns in dealing with these challenges.

Features of our educational programs that involve students in research activity include seminars emphasizing cutting-edge research, distinguished lectures, colloquia, seminar/discussion groups, advanced methodology workshops, and professional development. There is recognition at WSU that educational and research goals will increasingly rely on interdisciplinary inquiry to effectively address problems that transcend disciplines. Accelerating scientific and technological advances in such areas as nanotechnology has intensified the challenge to prepare students for living and working in the complex world they will inherit. One of our central educational objectives is to promote a multidisciplinary approach to science and technology with an emphasis on interdisciplinary learning.

Training and research programs such as the NSF Integrative Graduate Education and Research Traineeship (IGERT) programs increase synergies within and across projects and benefit researchers in training. These programs involve building on a firm base in one discipline, adding course work in complementary disciplines, and acquiring interdisciplinary training and research experiences in preparation for working across disciplinary lines. A scientist with a strong disciplinary base, but with understanding in multiple disciplines and how they interact, will be ideally suited to address research questions that overlap multiple disciplines.

Infrastructure Support for Faculty Scholarship and Research

Centers and Institutes

WSU has a strong tradition of research and scholarship rooted within academic disciplines. It is recognized, however, that many of the research issues of today transcend traditional academic areas and must be addressed by teams of faculty who bring their differing expertise together in a multi- or interdisciplinary program. Centers and institutes play an integral role in the University’s plans to encourage innovative, interdisciplinary scholarship, provide service to society and strengthen our performance as a nationally recognized research university.

Our centers and institutes embrace the multidisciplinary nature of scholarship and research and expand university boundaries by fostering collaborations with government, industry and other organizations to enhance economic growth and the quality of life locally, nationally and globally. Centers and institutes also provide research opportunities for our students. Our centers and institutes vary in size, focus, and mission. Approximately half focus on single-discipline research questions. The remainder are evenly divided between multidisciplinary research, instruction and/or community service. Centers and institutes are regularly reviewed to insure that their activities are consistent with their stated missions and that they are operating within scholarly and ethical parameters mandated by the University.

Information regarding individual centers and institutes can be found on a website managed by the Office of the Vice President for Research (www.research.wayne.edu/ci). A sampling of WSU's centers and institutes is described below:

- The Center for Automotive Research conducts interdisciplinary research and coordinates instructional programs in the automotive areas including combustion, performance, fuel economy, emission controls, friction and wear, and simulation of automotive engines.
- The Bioengineering Center conducts research on side-impacts, rear-end collisions, head injury and lower-extremity injuries. All current road vehicles include passenger safety enhancements based on research from this group, which has been in existence for almost 70 years.
- The Center for Chicano–Boricua Studies provides equitable access to a quality university education and enhances the environment of diversity on the campus.
- The Center for Peace and Conflict Studies (CPCS) develops and implements projects, programs, curriculum, research and publications in areas related to international and domestic peace, war, social justice, arms control, globalization, multicultural awareness, and conflict resolution.
- Barbara Ann Karmanos Cancer Institute established the first immortal hormone dependent human breast cancer cell line, MCF-7, and premalignant cell line MCF10AT. The institute synthesized AZT, ddC and d4T, and developed the first FDA-approved treatments for AIDS. Research programs include Breast Cancer, Developmental Therapeutics, Molecular Biology and Human Genetics, Population Studies and Prevention, and Proteases and Cancer.
- The Center for Molecular Medicine and Genetics' active research includes transcriptional and translational control, cell cycle regulation, chromosome dynamics and transmission, development and differentiation, molecular genetics and cytogenetics, molecular mechanisms of mutagenesis, signal transduction, cancer and metastasis, viral disease, molecular mechanisms of diabetes, collagen diseases and arthritis, neurological and neuromuscular diseases, gene therapy, mitochondrial and cardiovascular diseases, and human reproductive biology. It offers a master's degree in genetic counseling as well as Ph.D. and M.D./Ph.D. graduate training.
- The Center for Health Research's (College of Nursing) research teams are currently studying diabetes management, smoking cessation programs for Arab-American youths, how to help mothers with HIV/AIDS, healthy lifestyles in African American and Hispanic populations, blood pressure telemonitoring in African Americans, exercise and sleep in menopausal women, how to improve cancer pain management in the home, the effects of homelessness, and patient literacy levels.
- The Fraser Center for Workplace Issues continues the legacy of Douglas A. Fraser, former president of the United Auto Workers, and has sought and achieved pragmatic, workable solutions to complex challenges for improving the workplace.
- The Humanities Center nurtures interdisciplinary, transdisciplinary, and disciplinary work in the humanities and arts through competitions, seminars, discussion groups, and other programs for WSU humanities and arts faculty, students, and visiting scholars and artists.

- The Center for Urban Studies improves understanding of and provides innovative responses to urban challenges and opportunities; conducts and disseminates research, develops policies and programs, and provides training, capacity building, and technical assistance; and participates in defining and influencing local, regional, state and national urban policy.
- The Institute of Environmental Health Sciences conducts research on the short- and long-term effects of environmental agents on human health, particularly on the characterization of the cellular, biochemical and molecular mechanisms by which environmental agents cause toxicity and initiate and/or promote disease, thereby adversely affecting human health; serves as headquarters for an interdisciplinary graduate program offering M.S. and Ph.D. degrees in molecular and cellular toxicology; and is home to the Environmental Health Science Center of Excellence in Molecular and Cellular Toxicology and Human Applications. This center provides support for research projects with a focus on stimulation of collaborative interdisciplinary, multidisciplinary translational research employing contemporary molecular, cellular, genomic and proteomic approaches to the study of environmental agent effects on gene expression, cell signaling and function, and human populations with an emphasis on organochlorines/polycyclic aromatic hydrocarbon/solvents and particulates, which constitute major urban/southeastern Michigan toxicants.
- The Institute of Gerontology engages in research, education, and service in the field of aging, including the areas of Advanced Cognitive Training for Independent and Vital Elders, Adult-Onset Mobility Loss, Cognitive Aging and Neuroimaging, Cognitive Assessment and Early Detection of Dementia, and Reducing Effects of Homelessness among older African American women. The institute also operates many community-based programs such as The Healthy Black Elders, and through a recently renewed NIH-funded grant, will train 20 pre-doctoral students as well as eight post-doctoral fellows in aging and urban health.

- The Merrill-Palmer Skillman Institute began with the merger of the Merrill-Palmer Institute and the Skillman Center for Children to continue WSU's long history of conducting research in early development, early learning, adolescent behavior, as well as in social-psychological issues facing urban children and their families and providing information that could be applied to program development and policy formulation. Ongoing efforts include creating knowledge and informing policy makers, community leaders, and University faculty and staff through the dissemination of data and information on policies impacting urban children.

Libraries and Special Collections

The Wayne State University Library System includes five libraries providing a broad range of resources and tools and is ranked 47th among the 108 research library systems in the United States. The recently constructed undergraduate library contains state-of-the-art technology and information resources. Detailed information on the Libraries is included in Criterion 3.

The WSU Library System has made a major commitment to electronic tools and is ranked number one in the Association of Research Libraries Supplementary Statistics for percentage of acquisition dollars spent on electronic resources.

Sponsored Program Administration Online Services

The Sponsored Program Administration Office (SPA) Online Services are intended to help Wayne State researchers find the latest information on funding opportunities and policies. SPA's web pages contain electronic newsletters, links to funding, late-breaking grant opportunities and information on other SPA services. The SPA web page also provides links to a variety of research tools and information. This includes the Community of Science (COS) database, the largest repository of scientific information on the Internet, which provides easy-to-use information about scientists and the funding of science. At the heart of the COS system is the Faculty Expertise Database, in which faculty build and maintain verified, common-format profiles of their

interests and expertise, resulting in a resource that is institutional, national and international in scope. The COS Funding Opportunities Database contains worldwide funding information from federal and regional governments, foundations, professional societies, associations, corporations and other scientific organizations. This database can be accessed at www.spa.wayne.edu.

Sponsored Programs Information Network (SPIN)

SPIN is a computerized database, updated daily, of funding opportunities from federal, non-federal and corporate agencies. The database is designed to assist the Wayne State research community in identifying external support for research, education, and development projects. Using SPIN, investigators can quickly determine what funding is currently available and how it can be obtained. SPIN is available on the Internet through university networked computer workstations at www.spa.wayne.edu/spin.html.

Advanced Computing and Networking Services for Researchers

- WSU Grid and High-Performance Computing: Computing & Information Technology, in partnership with a number of Wayne State schools and colleges, maintains a campus-wide Grid and High-Performance Computing Facility for faculty, graduate students, post-doctoral students, and academic staff who have computationally intensive research needs.
- Advanced Networking on Internet2: Wayne State is a member of the Internet2 research and development consortium. Led by over 200 U.S. universities working in partnership with industry and government, the consortium seeks to develop and deploy advanced network applications and technologies, and thus accelerate the creation of tomorrow's Internet.
- The Abilene Network is an Internet2 high-performance backbone network enabling the development of advanced Internet applications and the deployment of leading-edge network services to Internet2 universities and research labs across the country. The Abilene Network supports the development of applications such as virtual laboratories,

digital libraries, distance education, and tele-immersion, as well as the advanced networking capabilities that are the focus of Internet2.

- High-Performance Research Network: Wayne State, Michigan State University, and the University of Michigan are founding members of the Michigan LamdaRail (MiLR) — one of the most advanced, very-high-speed dedicated research networks in higher education. MiLR connects WSU, MSU, and UM to each other and to national and international networking hubs in Chicago using over 700 miles of fiber-optic cable and dense-wavelength division multiplexing (DWDM) hardware. The exceptional speed and tremendous capacity of this new network are essential for supporting much of the research here and at other universities in the physical, social and life sciences. The new network will also serve as a test-bed for experimental research on networking itself.

Internal Funding Programs for Faculty Research

WSU has a number of competitive grant programs to assist faculty and researchers across campus. Applications to these programs are judged through a peer-review process involving faculty/administration committees or external reviewers. Many of these programs have the explicit aim of promoting interdisciplinary and multidisciplinary research and scholarship.

President's Research Enhancement Program

Since the 2002 academic year, WSU President Irvin D. Reid has supported an interdisciplinary research initiative, the Research Enhancement Program (REP). Each year, \$1.8 million has been set aside for competitive grants aimed at developing teams of investigators in designated areas. The program is designed to strengthen the University's performance as a nationally recognized research university by attracting additional external funding and advancing our graduate programs.

Assessment of the first REP, which focused on information science and technology, has shown some promising trends:

- WSU faculty displayed strong interest and research expertise in information science and technology. The announcement of the program drew over 60 inquiries and 33 initial proposals. The six projects funded involved 28 faculty members from 15 departments and six colleges, schools or divisions, illustrating the high level of multidisciplinary research and scholarship on campus.
- To date, the 2003 Research Enhancement Program has generated 11 external grant proposals that have been funded for \$6.5 million, and nine proposals are currently pending.
- The initial Research Enhancement Program has involved 44 graduate and post-doctoral students with REP projects; 14 undergraduate students participated in significant research.
- The Information Science and Technology REP has produced 111 publications and conference proceedings, one book, and 83 conference or workshop presentations.

Year 2 of the Research Enhancement Program (REP 2), the Children's Bridge, was aimed at research on issues of concern to children and families, especially in urban environments. Nine projects were chosen to receive funding based on their potential to support Wayne State's goal of developing research themes that are consistent with an emphasis on the urban mission, global presence, and technology:

- *Multilingual Development: A Cross-Disciplinary Study of Sound & Structure*, PI Jean Andruski (Audiology/Speech Pathology) \$199,997
- ***www.kids.wayne.edu***: *An Information Resource of Children, Family, and Community Status for Metropolitan Detroit*, PI Paul Giblin (Pediatrics) \$200,000
- *Neural Substrates of Information Processing in Fetal Alcohol Spectrum Disorders in the United States and South Africa*, PI Joseph Jacobson (Psychology) \$200,783
- *Development & Application of Novel Dendritic Nanodevice Platforms for Targeted Drug Therapy in Children*, PI Rangaramanujam Kannan (Chemical Engineering and Materials Science) \$244,700

- *The Differential Effects of Cumulative Violence and Trauma Exposures on Two Adolescent Populations*, PI Linda Lewandowski (Nursing) \$226,893
- *Effect of Early Computer Access on School Readiness and Psychological Development among Urban Preschoolers*, PI Xiaoming Li (Pediatrics) \$243,728
- *Technological Advances to Aid Children With Brain Injury*, PI Patrick McAllister (Neurosurgery) \$243,856
- *Differences in Etiology of Acute Lymphoblastic Leukemia Between Caucasian & African American Children*, PI Jeffrey Taub (Pediatrics) \$200,000
- *The Impact of Total Workload on Maternal and Infant Health: How Employment Before and After Childbirth Influences Maternal and Infant Health*, PI Eileen Trzcinski (Social Work) \$202,006

Early outcomes of Year 2 REP projects reveal that:

- WSU faculty have strong interests and research expertise in urban children's health, education, and development. Announcement of the program drew over 58 inquiries and 48 initial proposals.
- Multidisciplinary research and scholarship are again evident on campus. Nine projects were funded involving 54 faculty members from 27 departments, centers or institutes, and eight colleges, schools or divisions.
- REP 2 research has generated eight external grant proposals that have been funded for \$796,000.
- REP 2 has further enhanced graduate education; 18 graduate and post-doctoral students were involved with REP projects. Four undergraduate students had an opportunity to participate in significant research.
- Ten publications and 21 conference or workshop presentations have detailed the research results of these REP projects to date.

The third year of funding was designated for research aimed at understanding and overcoming the disparity in health outcomes, particularly those related to chronic diseases, among medically underserved and ethnic minority populations living in an urban environment. Part of the funds were used to build capacity in the NIH-funded WSU Center for Urban and African American Health (CUAAH), and the rest of the funds were committed to seed projects and pilot studies. The focused research area was the social and biological mechanisms and determinants underlying urban health disparities in outcomes related to chronic disease, broadly defined. Year 3 grants were funded in spring 2005, and it is too early to evaluate their outcomes; they are available in the NCA Resource Library.

The fourth year's funds are designated for research in two areas: continuation of support for CUAAH, and \$1.2 million committed to seed projects in nanotechnology. Information on the five projects funded is available in the NCA Resource Library.

University Research Grant Program

This program provides funding for regular full-time faculty and academic staff (per WSU AAUP-AFT Agreement), with preference to faculty below the rank of full professor. The program's purpose is to 1) support research in the form of summer stipends for nine-month faculty for whom a period of extended and uninterrupted activity is essential; and 2) support purchases of supplies and equipment not otherwise obtainable. Support to attend a professional meeting may also be requested. In 2004, the maximum grant was raised from \$7,000 to \$10,000.

Faculty Competition for Graduate Research Assistants (GRA)

Internally funded GRA positions are awarded directly to faculty on a university-wide competitive basis for support of their research/scholarship and training endeavors. Funding for assistantships is awarded primarily on the merits of the proposed research/scholarship and/or training opportunities, past productivity of the investigator(s), the award's potential for increasing publication output and external funding, and alignment with the University/unit strategic goals and objectives, as well as

the research/scholarship and training priorities identified by the schools/colleges. Priority is given to multidisciplinary projects.

Women of Wayne Alumni Association Annual Research Grants

This program annually makes funds available to female faculty and academic staff through an Annual Research Grant. Recipients are chosen by the Research Grant Committee of the Women of Wayne. All current, full-time Wayne State female faculty and academic staff may apply for these grant awards of up to \$1,000 each.

Minority/Women Summer Grant Program

This funding program was established under contract with the AAUP in FY95. The program provides \$50,000 annually for the purpose of allowing release time from teaching for faculty who self-identify themselves as being from a group that is under-represented within their discipline. A faculty committee reviews the applications each spring to select those individuals who will receive funding. Priority is given to individuals for whom this funding will provide a necessary boost to their application for tenure or promotion.

Grant Programs Offered by University Centers

Humanities Center Funding Opportunities

The Humanities Center supports a number of programs for faculty and students: Faculty Fellowships, Working Groups in the Humanities and Arts, Innovative Projects in the Humanities and Arts, Munusculum-Humanities Center Small Grants, and Visiting Scholars Program. A complete description of these is included in the NCA Resource Library. Since 1994, the Center has funded 132 Faculty Fellowships; since 1995, 55 faculty have been funded through the Innovative Projects Program; Resident Scholars account for 71 awards since 1997; and a total of 335 members have participated in Working Groups since 1999. Details of these awards are available at www.research.wayne.edu/hum.

Institute for Environmental Health Sciences Center in Molecular and Cellular Toxicology

Funds from this institute provide grants with the primary objective of supporting short-term projects aimed at exploring the feasibility of novel hypotheses in new areas of research that will enable investigators to obtain the requisite preliminary data to support a successful application for external grant support. The pilot projects are intended to a) provide support for new investigators interested in initiating new studies in areas relevant to environmental health sciences; b) stimulate new research initiatives and approaches that represent a departure from ongoing research by established investigators in environmental health science; and c) lead to the recruitment of investigators from other areas of biomedical research to apply their expertise to problems in environmental health research. Additional information is included in the NCA Resource Library.

Seed Programs in Public Health

The Institutes for Population Sciences, Health Assessment, Administration, Services, and Economics (INPHAASE) is a coordinated effort to integrate the faculty of Wayne State with the medical staff of Henry Ford Health System to pursue research on the biological and social bases for health disparities among populations of differing demographics, including ethnicity, economic status, and age; to test alternative strategies to overcome these disparities; and to develop health and information management systems that will provide outstanding health care in the most cost-effective ways. The core activities of INPHAASE involve chronic disease prevention and management in large urban areas epitomized by metropolitan Detroit. Activities include programs to change individual and population behavior related to health status, as well as the behavior of health care systems.

Barbara Ann Karmanos Cancer Institute

Funds from the Strategic Research Initiative Grants program annually offer support for outstanding developmental projects that

strengthen the research base of the institute. Funding for these seed money grants comes partially from the National Cancer Institute's Cancer Center Support Grant (CCSG) and from the institute's own resources. Grants funded in 2006 are listed in the NCA Resource Library.

Faculty Research Support through the Office of the Vice President for Research

The Office of Vice President for Research (OVPR) provides matching funds for proposals when the funding agency requires them. Matching funds for external awards come through OVPR's Research Stimulation Fund, which is funded principally through indirect costs from external grants. Most often matches are made for equipment grants. In FY 2004-05, OVPR contributed \$251,057 in matches for equipment grants from external agencies. Whenever possible, OVPR continues to fund faculty requests for bridge funding, new program initiatives and equipment (outside of requirements for grants as described above). In some years, OVPR has funds available from the Research Equipment Fund to invest in research programs.

In addition to responding to faculty requests for research funding, OVPR also stimulates research in specific areas by providing seed money grants. For example, OVPR provided the first year of funding for the INPHAASE initiative mentioned above. More recently it provided nearly \$1 million for nanotechnology projects in an effort to jump-start the nanotechnology initiative funded by the 2005-06 President's Research Enhancement Program described on pages 111-112.

External Support for Faculty Scholarship and Research

The research reputation, research ranking, and economic and educational impact of the University are all dependent on expenditures for research. Total research expenditures for the University for 13 years. Since 1996, the date of our last accreditation review, total expenditures have doubled. See **Figure 4.1**.

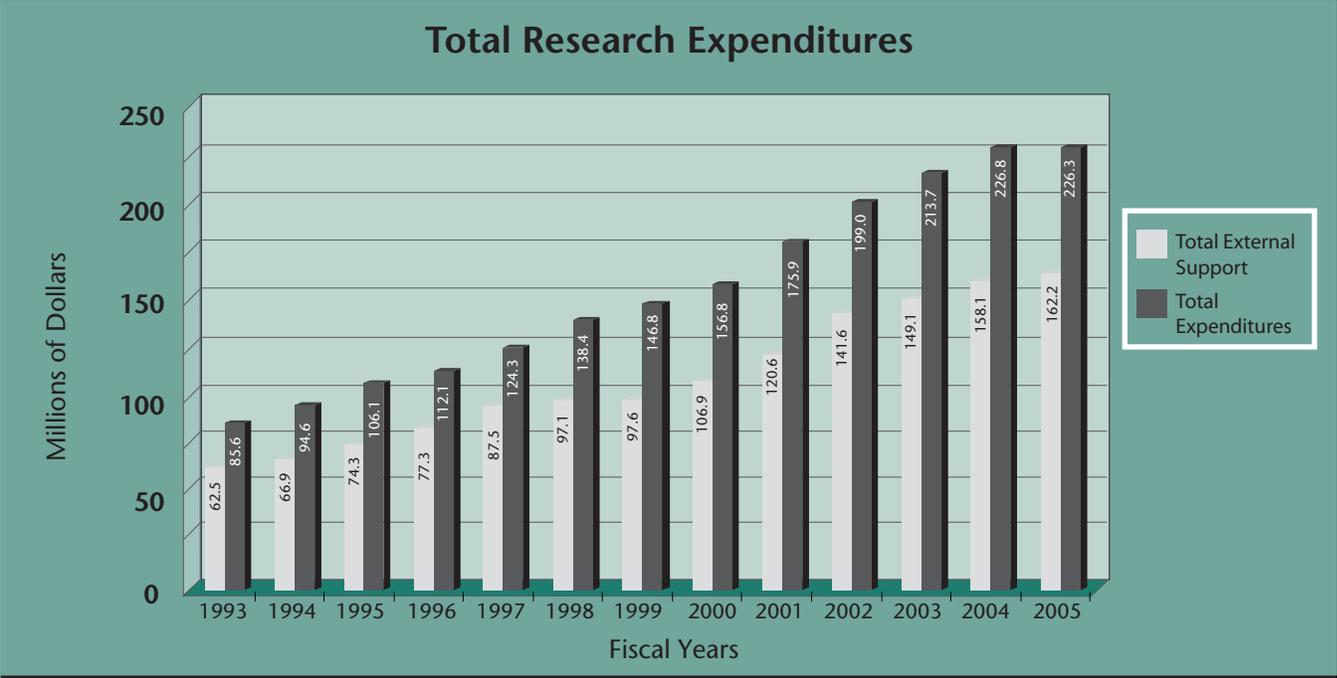


Figure 4.1

The recent history of the University's NSF ranking, which is based on total research expenditures and federal research expenditures

for all universities is shown in Figure 4.2. Our recent trend has been relatively stable.

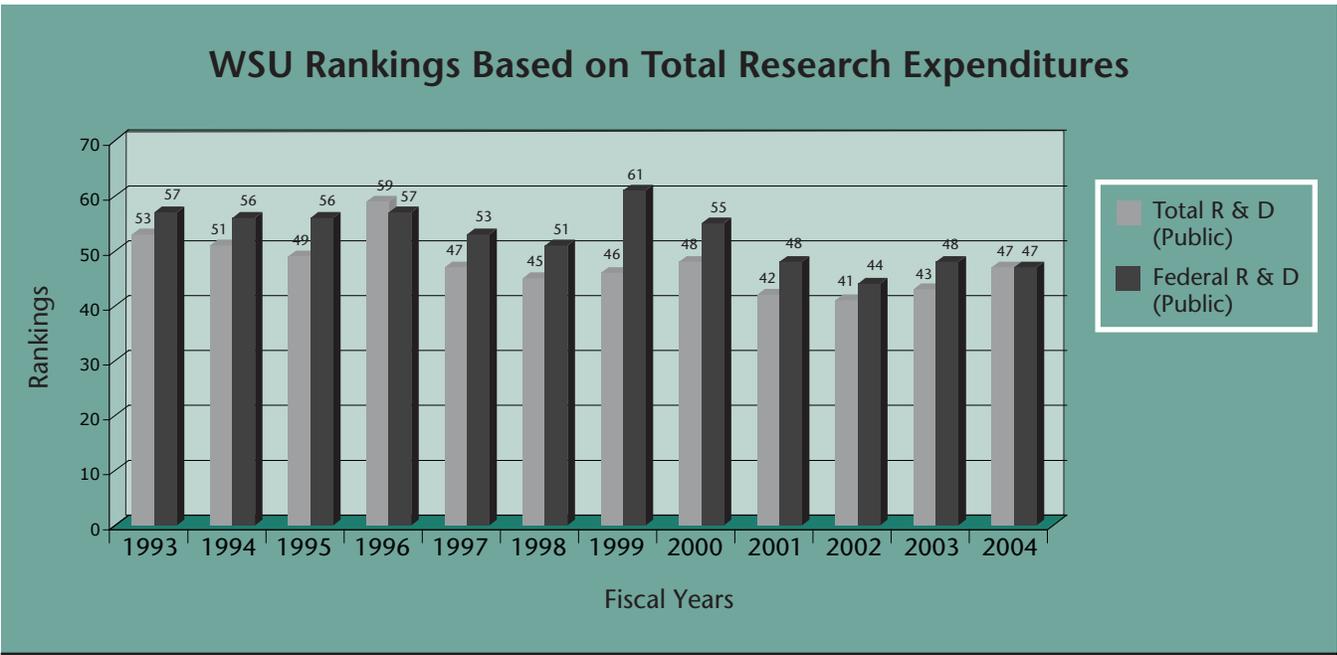


Figure 4.2

A second national ranking comes from the NIH. This ranking is based on NIH grants awarded, as opposed to expenditures. See **Figure 4.3**. The data indicate steady growth, again a doubling in NIH awards since 1996. Our rankings have remained relatively stable for the University and have changed from 47th to 54th for the Medical School over the nine-year span for which data are available.

In 2004, nearly 73% of our funding came from the federal government, slightly less than 10% from state and local government, less than 8% from industry, and 10% from all other sources. Our trend had been steadily upward; however, since 2003, we have leveled off, and we have initiated a number of research enhancement programs to reinvigorate our growth.

Challenges

It is well known that federal and state funding for research is not increasing significantly. Thus, all institutions are facing a major challenge. However, we need to understand why WSU is falling behind our competition and suffering a

decline in research ranking. Factors known to influence such downward trends are:

- Increased competition for fewer state and federal dollars;
- Aging research facilities;
- Static faculty size in funded research areas; and
- Recruitment of our top scholars from other universities.

Continuing Our Research Growth

The Research Stimulation Fund was specifically established a number of years ago to address several of the issues listed above by providing support for new research initiatives, equipment matches, bridge funding and other activities to promote research at WSU. **Figure 4.4** shows research stimulation funds from all sources increased to a total of \$4,130,168 in FY 2003. However, new federal requirements placed additional costs on federally funded projects, and research stimulation funds had to be tapped

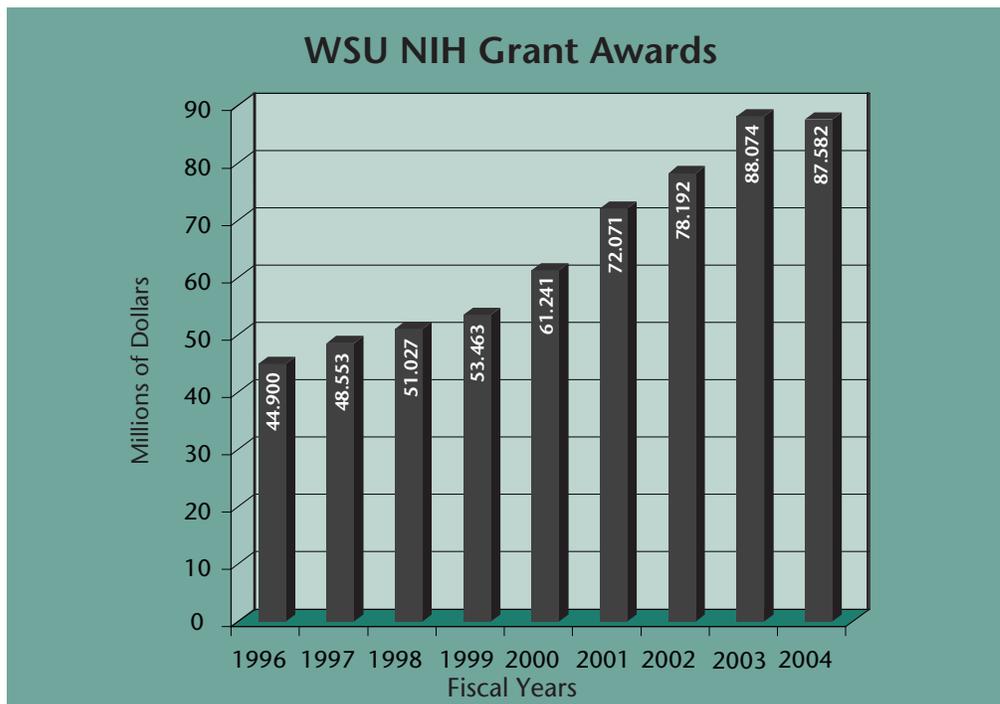


Figure 4.3

to cover these costs. Realizing just how critical research stimulation funds are to the University's mission, the President drew upon discretionary funds under his control to create a \$1.8 million Research Enhancement Fund to encourage increased research activity (see pages 111-112). An

additional \$1 million was added in FY 2006-07 to the Division of Research general fund budget to offset increased expenditures for federally mandated compliance programs.

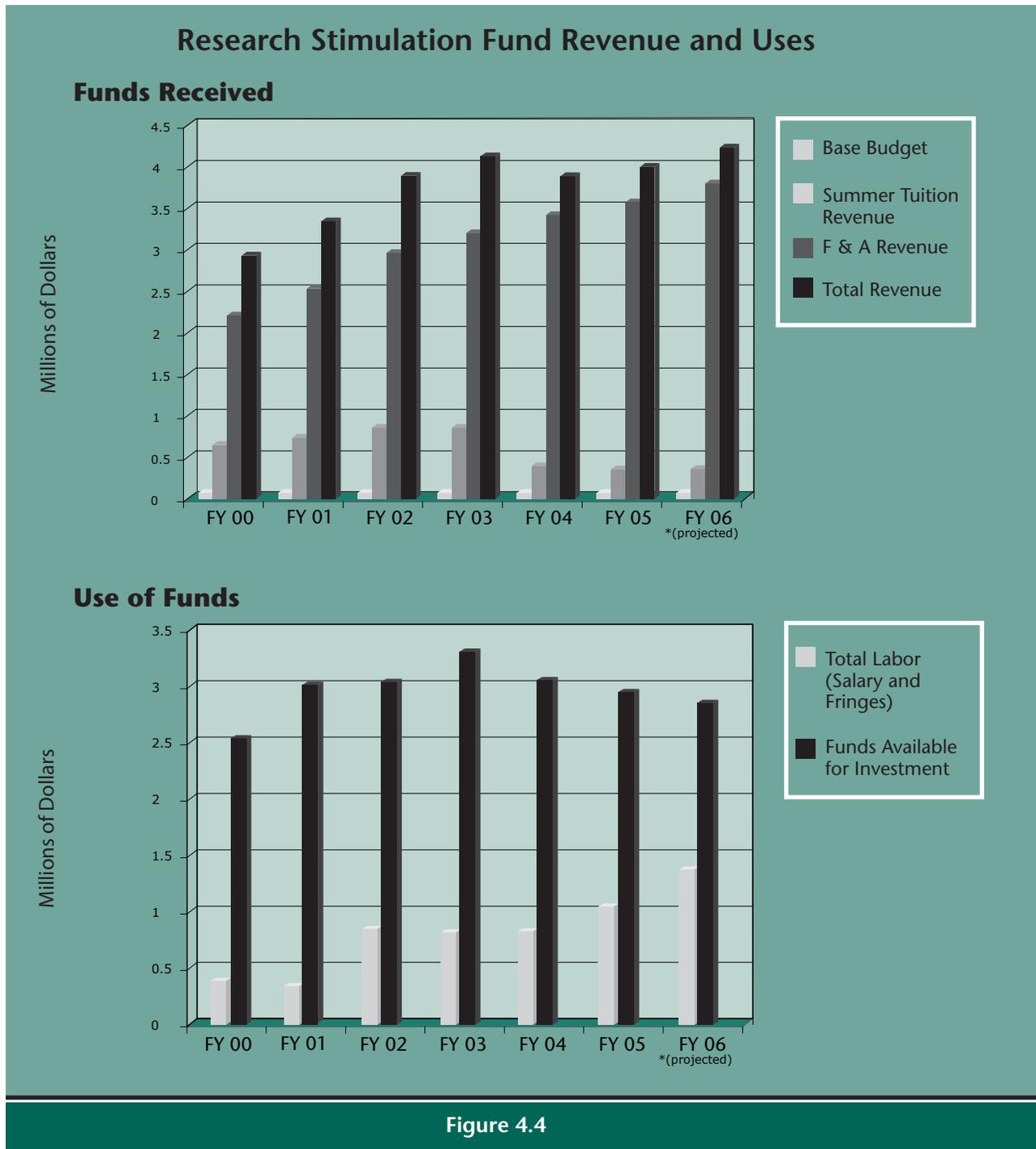


Figure 4.4

Additional steps have been or are being taken to stimulate continued growth:

- Two new staff positions have been created in the Office of the Vice President for Research (OVPR) to help develop major research grants with multiple investigators and to work with faculty in the humanities and the social sciences to improve our funded research record in these areas.
- An incentive plan is being developed and implemented that awards faculty for obtaining salary support from external grants.
- The University started its Nanoscience Initiative, in which the OVPR invested nearly \$1 million in startup funding, to pull together research teams for major grant efforts and to position WSU for possible state support. A seminar series also has been established. Additional funding of \$1.8 million has been provided through the President's Research Enhancement Program.
- Major efforts are under way to rebuild the Merrill-Palmer Skillman Institute as a premier center for child development and early education. These efforts will enhance the Children's Bridge initiative previously funded through the President's Research Enhancement Program (see pages 111-112), and will build our research programs associated with children and children's issues.
- The OVPR is spearheading an effort to build a strong public health research base. This is a cross-campus effort, with special involvement of the School of Medicine. Plans are under way to develop a new Institute for International Public Health, which would bring together WSU, the Henry Ford Health System, and the University of Windsor and draw upon the opportunities presented by diverse approaches to health care delivery, public health promotion and biosafety to develop a unique research program that would be attractive to funding sources on both sides of the Detroit-Canadian border.
- WSU applied for, and was recently awarded, a Clinical and Translational Science Award (CTSA) planning grant from the National Institutes of Health (NIH). This is a first step toward attracting a CTSA center. The CTSA

is a major initiative aimed at facilitating interdisciplinary research in health-related sciences, providing focused training in clinical and translational research, and enhancing the efficiency with which new innovations in research are brought to bear on disease treatment and prevention. This "bench-to-bedside and bedside-to-bench" approach requires extensive re-engineering of the University's research enterprise, including removal of barriers to interdepartmental and intercollege research and establishment of university-wide commitment to and governance of health research programs. Under the aegis of the planning grant, a Steering Committee has been appointed, with direct reporting to President Reid. Over the next year, we will focus on enhancements to our research enterprise in support of the CTSA. For example, we have recently announced that the 2007-2008 President's Research Enhancement Program will provide \$1 million in support of research in computational biology, including bioinformatics, which is an essential component of the CTSA. Additional financial and organizational commitments to the CTSA will be forthcoming.

Importantly, we have embarked upon a comprehensive facility plan that includes using all currently available research space more effectively. We have recently renovated space in Scott Hall (School of Medicine) and the Chemistry Building. Renovations have been planned and funds are in place for the Mott Center, housed within the Department of Obstetrics and Gynecology and devoted to research in women's health and child development. The Mott Center includes the Perinatology Research Branch of the National Institutes of Health. Ground-breaking is planned in spring 2007 for the new Engineering Development Center, which will add approximately 80,000 square feet of research and student project space to the College of Engineering. In addition, new buildings or major additions are on the horizon, including the Information Technology Building and the Multidisciplinary Medical Research Building.

In summary, WSU remains a leading research institution, and we are taking aggressive steps to continue our growth in research.

Internal Support for Student Research

Graduate Students

In addition to the Faculty Competitive GRA (Graduate Research Assistantships) Program, WSU has a number of other mechanisms to support graduate students, freeing them from the necessity of taking teaching assistantships and allowing them to conduct research full time. GRAs are also available through a variety of training grants, IGERTs and individual grants to faculty. Most importantly, the Provost's initiative to enhance graduate training through allocation of new funding (\$250,000 per year) to graduate programs is having a major impact on graduate student support (see discussion under 4b on page 140).

Other funds for graduate students include the following:

- The Humanities Center Edward M. Wise Dissertation Fellowship Program annually offers one doctoral student in the humanities and arts \$12,000 in support during the final stages of writing his or her dissertation. The Humanities Center also funds a travel award program for graduate students.
- The Graduate School sponsors an annual competition for Graduate-Professional Scholarships (GPS). The competition offers full academic year tuition scholarships to qualified applicants pursuing graduate or advanced degrees in all University programs. Awards are based on merit and are available to both full-time and part-time students.
- The Martin Luther King, Jr.–Cesar Chavez–Rosa Parks Future Faculty Fellowship Program is intended to increase the pool of minority students pursuing academic careers in post-secondary education in Michigan; the number of minority students pursuing doctoral degrees in Michigan; and the number of minority role models in disciplines in which minorities are underrepresented. The Fellowship Program provides an annual stipend from one to four years, up to a maximum of \$35,000 for a four-year period.
- The McNair Graduate Scholarship Program provides financial assistance to low-income, first-generation and underrepresented

undergraduate students newly admitted to graduate degree programs at Wayne State. It provides up to 12 graduate credits of tuition support.

- The Munich Exchange Fellowship provides one year of study at the University of Munich, with the remission of all tuition fees and a monthly stipend sufficient to meet a single student's normal living expenses for 10 months.
- An additional program, the Award for Graduate Students Who Obtain External Support, provides supplemental research funds for individual students who are successful in obtaining monetary support specifically related to a research project in excess of \$6,000 per year from an external agency.

Undergraduate Students

WSU has a variety of mechanisms to stimulate undergraduate participation in research.

Undergraduate Research and Creative Projects Grants

These funds are intended to enhance opportunities for undergraduate students to participate in research and creative activities under the guidance of faculty members. Undergraduate Research Grants are funded at a maximum of \$3,000 each. Applications are accepted bi-annually, with students required to write the research proposal with a simple endorsement from the faculty advisor. This program is administered through the University Honors Program, but all students are encouraged to apply.

In collaboration with the University's Honors Program, the Humanities Center provides Honors–Humanities Center Undergraduate Research Awards to support Honors theses and projects in the humanities and arts. The maximum award is \$500.

The Initiative for Minority Student Development (IMSD) (formerly the Minority Biomedical Research Support Program), funded by NIH and instituted in the fall of 1978, has the distinction of being the only one in the state of Michigan. IMSD is designed to stimulate and facilitate the progress of minority students toward

careers in biomedical research. The program has both undergraduate and graduate students. Undergraduate students are assigned to a research laboratory and, under the guidance of their research mentor, participate in research projects. Faculty participants are experts in the following areas: Anatomy, Biochemistry, Biophysics, Endocrinology, Immunology, Internal Medicine, Microbiology, Molecular Biology, Molecular Genetics, Microbial Genetics, Neurophysiology, Physiology and Psychology.

Undergraduate Funds for Travel to Conferences support undergraduate student research and encourage creative presentations at conferences and similar events. Awards of up to \$750 support the travel costs of undergraduate students who present papers or poster sessions or who perform or exhibit at refereed meetings and events.

Undergraduate students are encouraged to present their research at national conferences, including the annual National Conference on Undergraduate Research. The conference is nationally recognized as one of the best for undergraduate researchers and draws representatives from universities across the country. Thirty-one WSU students from nine departments made presentations in 2006 — double the number that participated in 2005. Travel funding is provided by the University.

University Support for Professional Development of Faculty, Administrators, and Staff

Professional Development for Faculty

A discussion of how WSU supports programs to enhance the teaching skills of faculty and graduate assistants appears under Criterion 3b. This section presents examples of how WSU supports faculty scholarship and research.

Research Grant Writing Seminars, Workshops, and Consultations

The Office of the Vice President for Research (OVPR) offers seminars addressing conceptual and practical aspects of grant writing, geared toward WSU's junior full-time faculty, senior graduate students, postdoctoral research fellows and residents. The OVPR has hosted five Research

Grant Writing Seminars, targeted to full-time WSU faculty members.

Since 2002, the OVPR has hosted four intensive Grant-Writing Workshops. Over a period of five months, these workshops guide selected faculty through the writing of each section of his/her own NIH or NSF grant proposal from the idea stage to the fully written proposal. Ninety faculty have participated in this program. To date, 15 of the 30 faculty who participated in the 2002 to 2003 workshop, and seven of 20 from the 2004 contingent, have gone on to win either NIH or NSF funding. WSU faculty who have attended the Research Grant Writing Seminars are also eligible to participate in one-on-one interactions to refine proposal-writing skills.

In June 2006, the OVPR embarked on a new advanced grant writing seminar focused on submitting renewals, re-submitting previously rejected applications and preparing a multi-investigator application.

Research Mentors Program for New Faculty

OVPR supports a program to encourage a productive mentoring relationship between newly recruited junior faculty and tenured faculty with strong research records and success in obtaining external research funding. This year-long mentorship provides guidance to junior faculty in all aspects of research program development, focusing on external funding opportunities. Mentoring activities include career development, guidance in establishing an independent research program, critique of manuscripts and grant proposals/applications, development of collaborative research opportunities, and guidance in participation in national activities, such as peer reviews and professional meetings. All new tenure-track faculty who are in the first two years at WSU are eligible. A payment of \$2,000 is made to the mentor's indirect cost accounts upon verification of application for external funding by the junior faculty member.

Another faculty mentoring program is sponsored by the Michigan Center for Urban African American Aging Research, one of six research centers on minority aging funded by the National Institute on Aging. This Center is jointly housed at Wayne State University (Institute of

Gerontology) and the University of Michigan (Program for Research on Black Americans). One of the Center's major goals is to identify and mentor investigators of multicultural backgrounds who are interested in conducting research on African American and/or Latino elders. Collaborative pilot projects that involve faculty from more than one department, school or institute are encouraged. Over the past nine years, 30 faculty members mentored in this program have received pilot funding (\$20,000) and attended a series of mentoring workshops, individual mentoring sessions, methodology workshops and a summer training program on grant writing and research development. Sixteen of these scholars have been from Wayne State (15 African American, one Latino) and 14 from the University of Michigan. They have received a total of \$320,000 in pilot funding through this program, resulting in grants from the NIH and other foundations in excess of \$2 million.

Schools and colleges have also implemented mentoring programs. For instance, the School of Medicine has initiated a mini-course on journal reviewing staffed by faculty who hold editorial positions on academic journals.

Professional Development for Academic Staff

As defined by the WSU/AAUP-AFT Agreement, a fund of \$30,000 is available for an Academic Staff Professional Development Program designed, conducted, and evaluated by the Academic Staff Professional Development Program Committee. The Academic Staff Professional Development Committee (ASPDC) is committed to providing opportunities for academic staff members to enhance their professional development through its support of both on-campus and off-campus workshops, seminars, and conferences (www.aspdc.wayne.edu). The travel fund program encourages staff to attend and present at national, regional, and local conferences.

Recent examples of workshops sponsored by ASPDC include "Updating your Library Skills: New Research Catalogues, Research Techniques, Databases and Legal Resources," "Tackling Critical Issues in Higher Education," "Grant Writing I and II" and "Preparing Presentations and Publications."

To supplement these formal programs, tuition

assistance is available to full-time salaried employees (not faculty) under the guidelines and terms of the appropriate bargaining agreement or University policy. This provides an opportunity for academic staff to continue and enhance their formal education.

Institutional Acknowledgement of Scholarly Success

Wayne State is proud of the research and scholarly accomplishment of its faculty and has many outlets for celebrating it, both within and outside the institution. Public Relations personnel maintain an active program of news releases and media events to inform the outside world about the successes of our faculty and students (www.media.wayne.edu). OVPR also publicizes research advances and in particular highlights those that lead to tech transfer opportunities. OVPR also publishes an annual research magazine, *New Science*, which is widely distributed outside of, as well as within, the University.

Research accomplishments are also announced on University websites www.life.wayne.edu and www.research.wayne.edu/rw. Furthermore, each college uses its website to spotlight the achievements of its faculty and students, and each college and many centers and institutes also have print newsletters that are distributed to alumni, donors and friends.

Institutional Awards for Research and Scholarly Excellence

On an institutional level, WSU provides a number of awards for recognition of faculty and academic staff contributions to the University and the academic community and for the pursuit of professional interests (www.wayne.edu/provost/programs/programs.html). The following list gives a brief description of some of the major awards available to faculty and academic staff on a University-wide basis.

Distinguished Graduate Faculty Award

This award is presented each year to two members of the Graduate Faculty whose scholarly activities have contributed significantly to the University's graduate programs. The awards are made in the natural/health sciences and the humanities/social sciences.

Board of Governors Faculty Recognition

Five members of the regular full-time faculty are honored each year by the University's Board of Governors for a particular accomplishment or achievement during the previous academic year. According to the award guidelines, the "work of merit should be a single act or event which constituted an outstanding contribution to scholarship and learning. It could be a publication, a scientific discovery, an exhibition, a performance, national recognition by a learned society, the organization of a symposium or conference of national significance, or a major contribution to the community."

Distinguished Faculty Fellowships

The Distinguished Faculty Fellowships recognize and provide support for members of the faculty whose continuing achievements and current activities in scholarship, research, or fine and performing arts, are nationally distinguished. The Fellowships have a dual purpose of not only recognizing past and continuing distinguished achievements, but also of supporting current scholarly activity of an exceptional character.

Alumni Faculty Service Award

The Wayne State University Alumni Association each year presents this award to two University faculty members whose professional or civic efforts have brought about a greater appreciation of the University's place in the community. This effort may be carried out either within the faculty member's University duties or in the community, provided that the work shall in some way reflect honor upon the University.

Career Development Chairs

This program is intended for recently tenured faculty in the early stages of their careers. Each chair is supported by a grant that provides an honorarium, funds for unrestricted research support, and funds for use in engaging part-time faculty to cover all or a portion of the chair holder's teaching assignment. A candidate must be nominated by his/her chairperson (or dean, in non-departmentalized colleges). Nominations are reviewed by an ad hoc review committee.

Technology Commercialization Inventor Recognition Lunch

The Technology Commercialization office hosts an annual luncheon to recognize faculty whose inventions have resulted in issued patents and/or licensing agreements. In addition, an "Inventor of the Year" is named. Information regarding faculty honored for patents issued in 2004 and 2005 is available in the NCA Resource Library.

Academic Staff Professional Achievement Award

The Academic Staff Professional Development Committee presents an award each year to an academic staff member for accomplishments in professional organizations, presentations, and/or publications.

Wayne State University Academy of Scholars

The WSU Academy of Scholars was founded in 1979 to raise the scholastic prestige of the University by bringing the most prominent academic experts to campus under its aegis and creating a community of scholars from among the institution's most celebrated researchers (www.academy.wayne.edu). Equal recognition is given for distinguished scholarship and creative achievement. As the highest recognition the University bestows, the Academy chooses for membership "the most productive and widely recognized" members of the Wayne State faculty.

Summary and Evaluation

As demonstrated by the numerous and extensive funding and professional development programs described in this section, WSU seeks to promote lifelong learning "by fostering and supporting inquiry, creativity, practice and social responsibility in ways consistent with its mission." A major purpose of all these programs is to provide the best educational experiences possible for WSU students. Research and scholarship are clearly integral parts of the curriculum for undergraduate, graduate and professional students, who indeed are making a lifelong commitment to their chosen areas of expertise, as well as to the culture of lifelong learning on the WSU campus.

A significant number of WSU undergraduates participate in research, supported either through the University's undergraduate research grants or private grant funding. Given the need for many of our students to work outside of the university, in addition to their formal class work, not as many of our undergraduates as we would like can avail themselves of this opportunity. We have developed an aggressive program to increase endowments for scholarships and special educational enhancements to address some of the economic hardships faced by a segment of our student body. It is anticipated that these programs will allow a greater number of students to take advantage of learning activities outside of the traditional classroom, including research.



4b. The organization demonstrates that acquisition of a breadth of knowledge and skills and the exercise of intellectual inquiry are integral to its educational programs.

The University aspires to implement its curriculum in ways that serve the needs of a non-traditional student population that is racially and ethnically diverse, commuting, working, and raising families. In addition to traditional academics, WSU provides curricular and co-curricular opportunities to engage students in developing understanding of the complex and diverse society in which they live. It seeks to prepare them for increased roles in the global society and to inspire them to look to new avenues for economic growth and development. WSU also draws upon the cultural wealth of the city of Detroit to instill in its students an appreciation of the arts, either as active participants or as current and future supporters of the world of fine arts and intellectual attainment. The importance of a broad education is institutionalized through the general education program required of all undergraduate students.

Review and Evaluation of Undergraduate General Education Requirements

In 2002, the Provost charged the Academic Senate's Curriculum and Instruction Committee and the Ad Hoc Committee on General Education to initiate a major review of WSU's General Education Program. The existing program, established in the 1980s, was designed to give students a broad view of the world in which they lived and equip them with an intelligent perspective on the social, political and technological challenges of the time. Reviewing the existing program was a major undertaking that challenged committee members to re-envision the program for the 21st century and redefine it for those who will graduate in the decade of 2010 to 2020. Our efforts engaged the university community in an in-depth and inclusive examination of General Education course work and experiences.

In defining the 2010 General Education program, the Curriculum and Instruction Committee and the Ad Hoc Committee followed the charge to:

- Define the preparation a liberally educated graduate will need and should experience in the decade of 2010-2020, based on data generated within and outside Wayne State.
- Respond to key factors in the environment (e.g., community colleges, other universities, high school curriculum) as well as in the University (e.g., staffing, curriculum, scheduling factors, graduate education, evaluation of faculty) that relate to General Education.
- Develop General Education objectives that are to be achieved by students.
- Develop an assessment plan that incorporates contemporary and emerging assessment practices for General Education to allow the University to acquire evidence about student achievement levels of General Education objectives and document whether the General Education Program is meeting its goals.
- Include elements in the program that may be a distinctive WSU hallmark, such as a capstone experience or skill set.

- Provide a proposed program that is consistent with the conditions of WSU and our students:
 - Provide flexibility for both transfer students and students who start at WSU in their first year.
 - Serve students who will complete liberal arts or professional degrees.
 - Propose a program that protects students if they change majors.
 - Propose a strategy that supports honors students as well as students who need additional preparation for success.
 - Incorporate creative ideas that support appropriate and effective student choice and decision-making.
- Develop a program consistent in size with national practice (i.e., roughly 35 credits that include all components' competencies and other requirements).
- Propose a process for joint University-unit responsibility that facilitates university-wide responsibility for requirements (i.e., since the University, not a unit, "owns" a requirement, a process needs to be in place to facilitate interaction between the unit and the University).
- Propose a process for ongoing review, assessment and change.

Planning and Implementing General Education for 2010 and Beyond

The strategy to develop the 2010 General Education Program proposal involved creating two groups to work cooperatively to evaluate proposals and finalize formal recommendations. The two teams included a small Working Committee and a larger Advisory Resource Committee. The Working Committee consisted of a student, four professors, an academic advisor, the president of the Academic Senate, the Associate Provost, and a dean who chaired the group. This group brought a diversity of perspectives and experience, combined with a serious commitment to the endeavor.

The Advisory Resource Committee was comprised of representatives from community colleges, area employers, students, faculty and staff from WSU schools and colleges not represented in the Working Committee, and an outside consultant. The Associate Provost also sat on this committee. A summary of the developed changes in the General Education program follows.

- Enhancement of the mathematics literacy requirement
- Enhancement of the computer literacy requirement
- Requirement that students have an "exposure" in three areas: cultural diversity; ethical issues in society; and science, technology and society
- Provision for up to two courses in any subject area to count toward fulfilling either group requirements or exposure areas (the previous plan allowed only one course)
- Acceptance of studio and applied courses that demonstrate to the General Education Oversight Committee fulfillment of the criteria for the Visual and Performing Arts component of the Humanities group requirement
- Discontinuance of UGE 1000 as a group requirement
- Replacement of the General Education Implementation Committee with the General Education Oversight Committee

While several changes were made to General Education requirements by the 2010 Committee and a major re-writing of requirements has taken place, it was understood by all that the new program would require continuous monitoring and assessment. Toward this end, the position of Associate Vice President for Undergraduate Programs and General Education was created. The 2010 Program proposal also established a General Education Oversight Committee that would assume the important task of monitoring and adjusting requirements. Placement, qualifying and proficiency exams are available for General Education courses and the University office of Testing, Evaluation and Research Services administers institutional exams that satisfy General Education competency/proficiency

and course placement/qualifying requirements. (www.bulletins.wayne.edu/GenEd/gened-index.html)

Learning outcomes have been developed for all General Education courses. They can be found in the NCA Resource Library in the document titled *General Education Implementation Committee: Compiled Requirements, Guidelines, and Criteria Governing Courses That Satisfy*.

Integration of Curricular and Co-Curricular Activities and Programs

WSU's Strategic Plan includes providing a "superlative learning experience that builds on the unique values and attributes of WSU," and developing "mutually beneficial partnerships with our community as catalysts for the social, economic and educational enrichment of the region." The integration of classroom and extra-curricular activities to broaden the education of Wayne State students is one mechanism through which this social mission can be achieved. Examples of how these goals are being addressed at the undergraduate level include:

- Students in the Honors Program participate in several core experiences over their four years at WSU. In year one, Honors students enroll in a year-long course on the city of Detroit, which examines American urbanism as a source of great ideas and challenges. In year two, Honors students pursue group projects in service learning. In year three, students undertake individual research projects. In year four, Honors students write a senior thesis integrating four years of core experiences. The Honors Program actively promotes the notion of informed citizenship as the foundation for academic achievement in a diverse, global setting. This underlying principle is evident in the core experiences and mission statement. (www.honors.wayne.edu)
- The Dean of Students Office, Detroit Orientation Institute and the Project Volunteer student organization have presented Alternative Spring Break Detroit for the past three years, giving students the chance to learn about, live in and volunteer in the city of Detroit during spring break. This program focuses on reinforcing the urban mission of Wayne State with students and immerses them in the lives and needs of the city.
- The Dean of Students Office, through the student volunteering and community service coordinator, offers students the opportunity to participate in both long-term and short-term volunteer projects. The goal of these projects is to link the urban mission of WSU to the needs of the surrounding community. These volunteer programs promote social responsibility and are great opportunities for students to begin a connection with the city.
- Learning Communities (LCs) offer residential students the opportunity to participate in campus activities related to academic interests. Centered in Yousif B. Ghafari Residence Hall, South Residence Hall, and The Towers Residential Suites, LCs promote collaborative learning and interaction between students and faculty (one-on-one and in small groups) with similar interests and goals. Designed for the social and academic needs of first- and second-year students, LCs designate specific building floors to focus on careers in particular areas such as those in health sciences or the arts. Students who participate in the LCs benefit from making friends in the same major, building a support base and creating study groups, all of which result in a more rewarding academic experience. During the 2004-05 academic year, students could choose from LCs that focused on healthy lifestyles, education, the city of Detroit, leadership, health sciences, and business. Participants attended cultural and civic events, visited local engineering companies, met professors over dinner, and learned to balance success in school, fitness, recreation, and life.
- The Campus Life Leadership Awards were created to recognize the achievements of students, student organizations, and student organization advisors who positively impact student life and growth at Wayne State and the greater Detroit community.
 - Students being nominated for the Emerging Leader Award have to provide evidence that they have developed their leadership skills and have taken on roles in co-curricular activities. The Campus Life Legacy Award is for seniors who have made significant contributions to campus life.

- The Outstanding Graduate/Professional Student Award recognizes graduate and professional students in leadership and service outside their academic programs.
- The Excellence in Programming Awards and Outstanding Student Organization Award recognizes a student organization that embraces diversity and academic success.
- The city of Detroit Service Award celebrates collaboration between WSU and the greater Detroit community.
- The Outstanding Student Organization Advisor Award recognizes a faculty or staff member who has gone beyond their normal day-to-day job responsibilities to support the growth and development of a student organization and its members.

■ National Design Competitions, such as the Formula SAE competition and the Concrete Canoe competition sponsored by the American Society of Civil Engineers, provide students with the opportunity to apply their classroom knowledge to solve a design challenge and compete against other students from around the world to test their developments. These projects are generally housed within the College of Engineering, but undergraduate and graduate students from all University programs are encouraged to participate. The student teams must design, test, and validate systems to meet specific performance goals — activities that prepare them very well for employment or continued education following graduation. Formula SAE, as an example, involves students annually from over 300 institutions around the world and receives substantial support from the automotive industry, which views the experience as a tremendous asset for future employees.

Community Outreach and Involvement of WSU Students and Faculty

TechTown Student Programs

WSU is a partner in the development of a research and technology park called TechTown. Unlike many research and technology parks that operate in greenfields — open spaces without neighbors, without communities — TechTown

is strengthening the urban community that surrounds it by preparing Detroit students for technology jobs and entrepreneurship through math and science tutoring, mentoring, and internship programs.

TechTown has developed a number of programs for primary and secondary students through a community-based organization called the Parent Child Computer Learning Foundation. College student members of the National Society of Black Engineers use the TechOne facility several evenings a week to mentor National Honor Society high school students who live throughout Detroit. A founder of Academic Computing Environments, one of TechTown's tenants, created a computer lab for student use.

Math Corps

Another program that links WSU students with middle and high school students across the city is Math Corps. The WSU Math Corps is a combined academic enrichment and mentoring program that brings middle and high school students from Detroit public schools together with college students to learn mathematics from each other as well as to interact with professional mathematicians in a university setting. It is based on the dream of creating a self-perpetuating “corps” of students from middle school through college who excel academically, hold values that breed success in general, and who, through strong mentoring relationships, pass their knowledge and their values on to younger students.

The Detroit Fellows Tutoring Project

The Wayne State University Honors Program initiated The Detroit Fellows Tutoring Project in the winter semester of 2004. It was designed as a service-learning program that would have a strong community impact — an Honors-directed study that required tutoring of Detroit Public Schools K-4 children in basic reading skills. Dr. Guy Blackburn took charge as the project coordinator and has successfully shepherded the program from an initial class of 51 in five schools — with several more schools on the waiting list. While initially an Honors-only elective, the project is now available to all undergraduates. Feedback from our fellows has been extremely positive, with many calling their tutoring experience a new and powerful education — something the classroom alone never offered them.

K-12 Summer Programs

Wayne State offers a variety of programs during the summer months for K-12 students. The goals of these programs are to enhance Detroit-area children's educational opportunities, improve their physical skills, and involve them in a number of programs in the arts. Programs such as E-Commerce Summer Camp, Football Skills Camp, GK-12 Science Camp, Hilberry Children's Summer Theatre Camp, the High School Engineering Training Institute, the Women in Engineering Training program, and many other camps provide children with additional knowledge and skills to enhance what they have learned in the classroom and their personal experiences. Many of these programs employ Wayne State students as instructors and mentors, allowing them to relate their knowledge and excitement of learning to the next generation of students. Further information about K-12 summer programs at Wayne State can be found at www.k-12.wayne.edu.

Community-Based Research and Mentoring Grants

The Honors Program offers a community-based research and mentoring grants program to build stronger relationships among faculty, graduate students and the Honors Program. Proposals are requested that initiate community-based research that addresses an issue, problem or need in metropolitan Detroit. The research should have immediate relevance to an identified community, organization or group within the metropolitan area and should involve both a graduate student and an undergraduate Honors student in designing, conducting and presenting the research. (The Honors Program will help identify an undergraduate student to participate in the project, if needed.) Special consideration is given to research projects that respond to a direct need or request from a community partner and that may lead to further collaborations with this partner, including a future service-learning course.

Any full-time faculty member with graduate-teaching status may apply for a Community-Based Research and Mentoring Grant. Up to two research awards are given each year, providing \$3,000 for the faculty member in summer salary, \$2,000 for the graduate student, and a \$1,000 stipend for the Honors student.

Community-Based Teaching Grants

The Honors Program also offers community-based teaching grants to build stronger relationships among the various university departments and the Honors Program. The Honors Program requests proposals from faculty to develop sophomore-level courses that will address community issues and be offered for Honors credit. (Any WSU student who meets course prerequisites may enroll, but Honors students must complete a service-learning option). The courses must be designed to meet both a general-education requirement in the discipline and the sophomore-level service-learning requirement in the Honors Program.

Honors students must complete a service-learning requirement that entails at least 20 hours of community service over the course of one semester; regular reflection in a journal or notebook; and a final report that uses academic research to analyze and explain one or more aspects of the service experience. "Service-learning" for the purposes of this grant is defined as an opportunity for students to learn course material through organized projects that help meet the needs of an identified community organization or group. Service projects must be designed and overseen by the instructor and one or more members of the community organization. Ideally, Honors service-learning projects meet an immediate need and produce outcomes that are of direct use within the community.

Arts, Cultural, and Intellectual Events

WSU's location in metropolitan Detroit offers students many opportunities to broaden their horizons beyond their academic studies. Within the University itself, there is an ongoing series of concerts, dance recitals, art exhibitions and other cultural activities. WSU's renowned graduate theater, the Hilberry, has a full season of classic and modern offerings. Outside of the University, there are a number of world-class cultural institutions.

The Detroit Symphony Orchestra (DSO) performs within easy walking distance of campus. An impressive number of DSO musicians are on the adjunct staff of WSU's Music Department and give lessons and teach master's classes on a regular basis. Furthermore, headliners such as Chick Corea give classes at WSU when they are in town. The College of Fine, Performing and Communication Arts has

also recently entered into an agreement with the DSO to provide full scholarships to selected high school students who have been trained in the DSO's pre-professional orchestra.

Other performance organizations are available to students and offer opportunities for mentoring and cultural growth. These include the Detroit Opera House, home of the Michigan Opera Theatre; the Fox Theatre, with a variety of headliner shows; the Fisher Theatre, which is Detroit's "Broadway" venue; the Gem Theatre, which features a more intimate theatre setting; and various venues within the Max M. Fisher Music Center, which is home to the DSO and sponsors jazz and world music concerts, dance performances, and poetry performances on a regular basis. All of these venues have student rates as well as "rush" tickets that are obtainable before each performance.

WSU is also surrounded by museums, most notably The Detroit Institute of Arts (DIA), home to an impressive collection of American and African American art as well as host to international traveling exhibits. The DIA is a great resource for WSU Art and Art History students and offers pre-professional internships in a variety of areas. Other nearby museums include the Charles H. Wright Museum of African American History, the Detroit Historical Museum, and The New Detroit Science Center. The Detroit Public Library is also a major research resource to WSU faculty and students and hosts exhibits and lectures on a wide variety of topics.

The Honors Program includes "The Cultural Passport," a special offering for Honors freshmen that introduces students to cultural, artistic and industrial aspects of Detroit as they relate to the Honors signature courses, City One and City Two (HON 1000/2000). Passport events cover a broad range and include activities such as visiting special exhibitions at The Detroit Institute of Arts, attending events at the Hilberry Theatre or The Detroit Opera House, or even touring the Detroit Water and Sewerage Department's Water Works Park. More information about this program can be found at www.honors.wayne.edu/culturalpassport.php.

Integration of Undergraduate and Graduate Training and Technology Transfer

Research at WSU is often focused on real-world issues and, increasingly, on research outcomes that will improve the economic status of the state of Michigan and the entire nation. The Technology Commercialization office involves undergraduate and graduate students in the tech transfer process, not only to foster recognition and protection of intellectual property rights of students involved in translational research, but to help educate entrepreneurial students about possible roles in the development of new technological industries in the coming decades. The WSU technology transfer process and the University's patent and copyright policy are described in detail at www.techtransfer.wayne.edu.

In September, 2006, the *Detroit Free Press* lauded WSU in a report on a visit from Michigan Governor Jennifer Granholm:

Granholm met with students and faculty and congratulated WSU for having been awarded five grants totaling \$7.2 million from the state's 21st Century Jobs Fund initiative. She also took a tour of the University's College of Engineering and saw some of the alternative energy projects being developed.

More than \$2 million of the money granted to WSU was awarded to professor K.Y. Simon Ng, director of alternative energy technology, for a project to develop synthetic fuel to power mobile generators for the military. The collaboration is a public-private partnership between WSU, Detroit-based Titan Energy Development Inc. and the National Automotive Center.

The 10-year, \$2-billion program was established in January to help create as many as 70,000 jobs in the areas of alternative energy, life sciences, advanced automotive research and homeland security. The initiative also will encourage the commercialization of technologies and products from Michigan-based companies.

Technology Commercialization staff work with research faculty and graduate students to identify innovations with commercial applications and

develop protection for them through patents or other means. Each inventor team, which often includes graduate students, has an opportunity to present its discovery to a WSU patent committee. When the invention is accepted for investment, outside patent counsel works with the inventors to draft and submit a patent application. After the application is filed, Technology Commercialization contacts potential licensees and, if successful, negotiates an appropriate license agreement. After the license agreement is signed, the inventors are sometimes involved with further development of the technology. In some cases, the University takes the initiative to start a new company to license and develop the invention.

Graduate students and, occasionally, undergraduate students are involved in the conception, or reduction to practice, of WSU inventions. As inventors, the students are exposed to concepts of intellectual property protection and management, patent prosecution, and various business arrangements, including licensing and product development. Some of the benefits to students and the University include:

- **Partnerships with industry:** Student inventors may become active participants in additional basic or applied research on the invention, in addition to further commercial development of products or processes.
- **Future employment:** Student inventors, in particular graduate students, are often considered for employment at the company that has licensed the technology. Recruitment of the university inventor is highly advantageous because of the knowledge transfer inherent in employing such student inventors.
- **Endowments for Student Support:** Technology Commercialization matched a \$1 million donation from a licensee to create the Schaap Graduate Stipend Endowment to support exceptionally well-qualified Ph.D. students in chemistry by providing them with competitive stipends for study at WSU. To date, \$700,000 has been paid by Technology Commercialization with an additional \$300,000 paid in fall 2006.
- **Inventor compensation:** As inventors or contributors, even if they are not named on a patent application, students may be entitled

under WSU policies to share a portion of the revenue received from licensing.

- **Start-up companies:** Students, whether inventors or not, may have an opportunity to join a WSU spin-off company. They may also assist in assessing technology to determine if it is suitable for a start-up and developing a business plan for the new company. Such experience is invaluable for students because it is “hands-on” and may position them for future entrepreneurial careers.

Statistics on the number of students who have been involved in the technology transfer process during the past five years are as follows:

- Number of invention disclosures involving students — 43
- Number of patents and patent applications involving students — 44
- Number of license agreements involving students — 13
- Number of students who took jobs with licensee — 8
- Amount of royalties paid to students — \$133,600

Venture Development

In 2005, the Venture Development Office (within the Technology Commercialization Office) initiated an annual conference, E2detroit, (Entrepreneurship and Economic Development). This conference features parallel activities: a business plan and marketing competition and an entrepreneurship symposium. In the first activity, graduate students from the WSU School of Business Administration form teams, which include a WSU professor and a venture capitalist. Over a one-week period, the teams choose a product or service and compete to sell that product or service to the entire campus community. This challenge offers each team a unique and relevant learning experience. The second activity features nationally known speakers discussing a range of topics relating to entrepreneurship such as raising venture capital, business plans, recruiting qualified management and growing a high-technology business from the ground up.

For the past four years, the director of the Venture Development Office has developed curriculum and taught entrepreneurship courses in the WSU business school. Teams of M.B.A. students select a specific, actual WSU invention to evaluate. Working with the faculty member who invented the technology, they assess the commercial prospects of the invention and recommend a course of action, e.g., patenting and traditional licensing, start-up company formation, or abandonment. Each team does a final presentation before a panel of local venture capitalists that provides invaluable feedback. In the event a company is formed based on a WSU discovery, the M.B.A. students may have an opportunity to join the start-up or even to become founders themselves and negotiate a license for the intellectual property. Finally, various professional staff in Technology Commercialization serve as mentors for the teams or speakers for the classes.

In addition, the following activities have been developed to allow students across the university to participate in venture activities that will provide them with invaluable skills for the current economy.

School of Medicine Entrepreneurship Course

Professional staff in Technology Commercialization organized and taught a course titled “The Business of Biotech” for WSU graduate students in the life sciences considering a career in the life science industry. This course was part of a statewide initiative, the Michigan Entrepreneurial Education Network, developed to encourage biomedical entrepreneurship and economic development.

WSU Entrepreneurs Network

The Venture Development Office sponsors 10 breakfast meetings per year at which experts talk about an issue relating to starting a high-technology enterprise. Attendees are typically faculty and student entrepreneurs, and this provides them an opportunity to network with others who have gone through or are considering going through the process. All attendees receive reference books on a topic related to the theme of the meeting.

WSU New Ventures Investment Circle

Wayne State is in the process of creating a pre-seed venture capital fund to provide another source of investment for the University’s start-up companies. As envisioned, one aspect of the fund would involve the use of WSU graduate business students to perform a key role in the due diligence process. The students would help evaluate platform technologies and investment opportunities and recommend projects for pre-seed funding. It is conceivable the students would be the final decision makers on such investments.

College of Engineering Ventures Program

Sparked by a \$2 million pledge from Civil Engineering alumnus James Anderson, the Engineering Ventures Program is being developed to provide undergraduate and graduate students with the skills necessary to move into entrepreneurial endeavors during school or after graduation. Speakers are brought into a freshmen-level course (BE 1050) to discuss goal-setting and entrepreneurship. Through the student chapter of the Collegiate Entrepreneur Organization (CEO), seminars that focus on the key skills required to be a successful entrepreneur are held on a regular basis. Students are also encouraged to bring a spirit of entrepreneurship to their roles in larger companies.

Statistics on the number of students involved in the venture development process during the past five years show the following:

- Number of students who have been founders of start-ups — 1
- Number of students who obtained jobs with start-ups — 28
- Number of students taking WSU entrepreneurship courses led by venture development staff — 250+

Additional technology services available through the Technology Commercialization Office include:

- Grants and awards to support selected projects;
- Financial support for projects that benefit graduate or undergraduate students;

- Support for Michigan biosciences events that benefit students;
- Assistance for faculty seeking federal, state or foundation funding; and
- Protection of students from inappropriate actions or demands.

Additional information on technology resources available to students can be found in the NCA Resource Library.

Summary and Evaluation

Our General Education program’s requirements have undergone extensive review and analysis in recent years. The newest requirements comprise the 2010 General Education Program. Enhancement of the mathematics and computer literacy requirements and the development of the General Education Oversight Committee were major changes. Most importantly, a more sophisticated evaluation and analysis of General Education should result from creation of the Associate Vice President for Undergraduate Studies and General Education and the subsequent retention plan that has been developed and is being implemented. This will have a positive impact on General Education classes.

As for Criterion 4a, some of the NSSE questions address the effectiveness of the General Education and co-curricular programs described in Criterion 4b, as judged by our undergraduates. Those questions relating to General Education reveal that WSU students feel they are prepared as well, or better, than students in the comparison schools. Thus, WSU students report favorably in regard to:

- Being able to integrate ideas from various sources;
- Being able to synthesize and organize ideas;
- Being able to judge the value of information from various sources;
- Applying knowledge to practical problems;
- Writing clearly and effectively; and
- Speaking clearly and effectively.

Also, our students report rates similar to other urban universities for success in learning to think

clearly and in analyzing quantitative problems, although they lag behind students from graduate extensive schools in these regards. They are similar to all students in studying a foreign language (~50%).

However, in regard to participation in co-curricular or global activities, our students again demonstrate lesser rates of participation than other institutions. For example, although a third of our freshmen plan to study abroad, only 6% of seniors have done so, compared to 17% of seniors overall. Several of these issues may be related to the economic realities faced by our students, as discussed previously, and efforts are under way to raise funds for Study Abroad programs.

In addition, this section describes new initiatives to better incorporate co-curricular activities into the lives of undergraduates, such as the Honors course on the city of Detroit, Alternative Spring Break, promotion of urban-based volunteerism and establishment of the Learning Communities in our new residence halls. Further, integration of undergraduates into technology transfer projects, the Math Corps, and opportunities provided by nearby cultural institutions open doors to these students that do not depend on going abroad or giving up one’s job. Still, the NSSE survey points out that WSU needs to enhance and develop more alternate approaches to providing broad and global educational opportunities to our undergraduates.



4c. The organization assesses the usefulness of its curriculum to students who will live and work in a global, diverse, and technological society.

WSU assesses its curriculum to assure that students gain knowledge to live and work in a global, diverse and technological society. This assessment involves identification of learning outcomes, evaluation of teaching and learning, review of academic programs, and resulting development of curricular and technological enhancements to address deficiencies. Criterion 3 documents the policy, procedures and resources utilized by Wayne State to ensure effective teaching and optimum learning. In this section,

emphasis is placed on how educational programs are assessed in regard to preparation of students to thrive in our increasingly complex society and succeed in our increasingly global and technology-driven work environments.

The Office of International Programs (OIP)

The importance of global programs in WSU curriculum led in 2005 to the establishment of a new administrative unit, the Office of International Programs (OIP). OIP is comprised of the Office of International Students and Scholars, Study Abroad and Global Programs, World Bridge, the English Language Institute, and the Office of the OIP Executive Director. OIP not only assists with faculty and student initiatives, but also initiates programs and projects.

OIP is a strong and aggressive advocate for foreign students, scholars, and visitors; it strives to increase the number of domestic students involved in Study Abroad programs; seeks to promote goodwill between foreign and domestic populations at all times and throughout the University, especially as this relates to International Education; and strongly supports the recruitment and retention of growing numbers of international students and scholars at Wayne State.

Study Abroad and Global Programs

WSU has long had an active Study Abroad and Global Program. Specifically, the Study Abroad Office has provided critical support to colleges, schools, departments, faculty, staff and students in areas where individual units needed levels of expertise in the area of global education. For example, assistance was provided to faculty in the development of international programs for exchange of teaching and research personnel, exchange of students, international transfer of courses, and collaboration on distance learning programs. The outcome of those efforts has resulted in:

- An Agreement for Academic Cooperation between WSU's Law School and Kwansai Gakuin Law School, located in Nishinomiya, Japan, that lays the foundation for future collaborations in the areas of student and

faculty exchanges in law education.

- A student exchange program between Lebanese American University and Wayne State University's Eugene Applebaum College of Pharmacy and Health Sciences. This program allows WSU pharmacy students the opportunity to complete up to three rotations abroad.
- Student and faculty exchange programs between the College of Fine, Performing and Communication Arts and the State University of Utrecht, Netherlands; the Free University of Bozen-Bolzano, Italy; and Mälardalen University, Sweden. This program, led by Dr. Judith Moldenhauer, is funded by the U.S. Department of Education Fund for the Improvement of Postsecondary Education (FIPSE) grant. The program allows student and faculty exchanges in informational design.
- An Agreement for Academic Cooperation between Bavarian International School and the WSU Library System that provides students in the Library and Information Science Program with an opportunity to participate in library internships in Munich, Germany.
- An Agreement for Academic Cooperation between Instituto Motori, located in Napoli, Italy, and the College of Engineering. This agreement lays the foundation for future collaborations in the areas of student and faculty exchanges in mechanical engineering.
- In 2006, the College of Engineering signed agreements with six schools at Tongji University in Shanghai to offer collaborative master's degrees. These programs are expected to bring 200 students per year to WSU.

WSU also maintains a Global Grant Competition for full-time faculty and academic staff, designed to encourage and support international activity at Wayne State. Winning proposals reflect the diverse interests and creativity of WSU faculty and academic staff, and build on prior efforts of internationalizing the campus and curriculum. Just a few recently awarded projects are:

- *The Urban Development of Rome*
Sarah Bassett, Art and Art History
Brian Madigan, Art and Art History

- *14th Annual Wayne-Windsor Canadian Studies Symposium: Security, the Border and the Canada-U.S. Relationship*
John J. Bukowczyk, Canadian Studies Program
- *Asian American International Med Conference: Medical Care and Education for the Global Village, Colombo, Sri Lanka*
P.H. Chandrasekar, Internal Medicine
R. Munasinghe, Internal Medicine
- *International Cultural Competency for Health Care Delivery*
Randall Commissaris, Pharmaceutical Sciences and Kim Dunleauy, Clinical Health Care Sciences

Course Offerings in Study Abroad Programs

Examples of Study Abroad opportunities for students include the following; additional information about each of these can be found in the NCA Resource Library.

- Brazil — Student Exchange Program in Literature, Cultural Studies and Cinema
- Canada — University of Windsor Exchange
- China — Innovation in America and China; Summer Homestay Program
- Croatia — Dubrovnik Seminar on Divided Societies
- England — University of Salford Exchange; Children's Literature and Its Beginnings: A Travel Study Course in England
- Europe (various countries) — Undergraduate and Graduate International Business Seminars
- France — Humanities Spring Break in Paris; Semester at the EurAm Abbey
- Germany — Junior Year in Munich; Graphic Design
- Ghana — Dimensions of the African Experience
- Greece — Ancient and Modern Greek Culture and Language in Greece
- Italy — Summer Educational Program in Gagliano Aterno; The History and Urban Development of Rome; International Exchange Program in Information Design
- Japan — Japan Center for Michigan Universities (JCMU); Summer Homestay Program
- Mexico — Spanish Language, Literature, and Culture in Xalapa
- Netherlands — International Exchange Program in Information Design
- Peru — Pharmacy Program in the Amazon
- Poland — Seeing to Remember: An Interdisciplinary Holocaust Program; Survey of Polish Culture
- Puerto Rico — Engineering Exchange at the Polytechnic University of Puerto Rico
- Romania — Study Computer Science at Babes-Bolyai University in Cluj-Napoca
- Russia — A Month in Moscow at the Moscow Art Theatre School
- Spain — International Perspectives on Education, Disability and Multiculturalism
- South Africa — Graduate Planning Study Program

In addition to the established Study Abroad course offerings, OIP is in the process of developing a global leadership program. This program will include formal course work and relevant apprenticeship experiences including:

- Active leadership experiences at Wayne State;
- Global Leadership Internship with Detroit-based multinationals, law firms, and non-governmental organizations;
- Overseas experience in a developing nation (Tanzania, Belize, Brazil); (variable duration and credit, and paid/unpaid); and
- Upon completion of the program, participants will become Global Leadership Fellows of Wayne State.

Assessment of Learning Outcomes

Each of the 11 schools and colleges of WSU have identified specific program objectives and use these objectives to assess student learning outcomes as appropriate for individual disciplines.

The complete statements of objectives and projected outcomes parallel the core missions of the schools and departments at WSU and constitute the working guidelines on which these divisions base their academic, scholarly and social activities (www.wayne.edu/academic_programs.html). Two examples of this are:

- The College of Fine, Performing and Communication Arts builds into its curriculum over 300 live student performances and exhibitions during the academic year. These opportunities, which are reviewed and juried by the faculty and presented to the general public, give our students real-life practical experiences that prepare them for continued learning and allow and encourage them to demonstrate the breadth of their individual skills and intellect.
- The objectives of the undergraduate program in the Department of Mechanical Engineering in the College of Engineering are to provide the education and training that will enable its graduates to: 1) successfully pursue entry-level engineering positions or additional degrees; and 2) apply broad, fundamentals-based knowledge and up-to-date skills to professional or academic situations. Some clearly defined expectations include the ability to understand scientific principles and apply them to the practice of engineering, as well as being able to communicate effectively.

Assessment, Currency, and Involvement of Constituents

Engineering

Curricular evaluation often involves alumni, employers and other external constituents who understand the relationships among the course of study, the currency of the curriculum, and the utility of the knowledge and skills gained. In the development of educational objectives

and outcomes for programs in Engineering, the inclusion of input from involved constituencies is very important. The processes in place in the College of Engineering are prime examples of this. The College's Board of Visitors consists of representatives from the automotive, energy, supplier, construction, medical, and information technology industries, as well as government and public utilities. The majority of board members are in executive positions: directors, vice presidents and CEOs. In tri-annual meetings, these representatives, including both alumni and others not previously affiliated with the University, provide input on the future educational and research directions of the college. In the past few years, this has included assisting the college in determining which proposals to submit to the University-wide competition for Graduate Program Enhancement (funded in 2004 and 2005) and which features to include in the new Engineering Development Center.

To reflect the advisory structure at the college level, each department in the College of Engineering has formed an external advisory committee consisting of representatives from industry and educational programs. These committees meet once or twice a year to discuss developments in the academic programs, assess the programs and identify possible program enhancements. At the undergraduate level, these external advisory committees participate fully in the development and review of educational objectives and program outcomes, which are required by Accreditation Board for Engineering and Technology for engineering program accreditation. The information gained from these regular interactions with external constituencies is included in the ongoing assessment and evaluation of the educational programs in the College of Engineering.

The opinions of experts in the industries served by the College of Engineering are supplemented by those of our most important constituents: our alumni. Every five years, alumni are surveyed to determine their opinions on the performance of our educational programs and to identify program areas that should possibly be included or improved upon in the future. By focusing on alumni, engineering programs are able to tap into the hindsight of our former students who may have discovered through their professional activities the benefit of certain program

components that may not have been evident during their student days.

Other WSU units likewise depend upon students, alumni, and appropriate industry experts to assess the relevance of their curriculum to real-world circumstances.

Nursing

The College of Nursing conducts clinical site evaluations by faculty and students each semester to assess the strengths and limitations of the health care agencies in which students have clinical experiences. These experiences constitute a significant portion of the undergraduate nursing curriculum. This information assists faculty in identifying those settings that hold high professional standards of care, that are highly supportive of student learning and who allow flexibility for faculty to select clients who meet course objectives. Some clinical agencies formally and informally seek input from the College of Nursing to assist them in improving care. The College of Nursing students benefit from the interactions.

In addition, agencies where College of Nursing graduates are employed are periodically surveyed about their satisfaction with the performance of these nurses. Agencies have responded positively, validating the curriculum. These data are used by the Curriculum Committee in its ongoing review of the curriculum. Recommendations for change are given to faculty.

Surveys of master's students and nurse practitioners conducted in 2003-04 to gauge satisfaction with their preparation for a professional role indicated a high degree of satisfaction, with some suggestions for changes. This information was included in the ongoing review and revision of the master's program. Revisions were implemented in fall 2006. Examples of changes include increased hands-on practice to improve students' clinical expertise and changes in some course content to assure that students are eligible to sit for national certification exams essential to advanced practice.

Student Evaluation of Teaching (SET) information also assists the College in matching faculty expertise with the objectives of each course. The complex clinical curriculum for nursing is led

by academic nurse practitioners who keep the curriculum current with the rapid changes in science and nursing practice.

School of Social Work

The School of Social Work has several strategies for feedback to keep the bachelor of social work (B.S.W.), master of social work (M.S.W.), and Ph.D. curriculum current and relevant. These strategies include:

Field Education Advisory Group (FEAC)

Selected experienced and advanced M.S.W. practitioners, who serve as field instructors for B.S.W. and M.S.W. students in their field placements (internships), serve on the School's Field Education Advisory Committee. The FEAC is chaired by the School's Director of Field Education. Coordinators of the B.S.W. and M.S.W. programs also serve on this committee. Recently, the FEAC revised the fieldwork syllabi (for B.S.W. and M.S.W. programs) and the instruments to evaluate undergraduate and graduate student performance in the field. These revised syllabi and instruments were submitted to the B.S.W. and M.S.W. program committees and, subsequently, the faculty for approval.

Curriculum and Instruction (C&I) Days

Meetings of the full-time and part-time faculty are held four times annually to address issues of curriculum and instruction in the school. In addition to presentations on curricular and instructional strategies, a time is set aside at each C & I Day for full-time and part-time faculty to review the curriculum and identify areas for change or enhancement. Experienced part-time faculty are drawn from the social work, social welfare and broad human services communities to teach, primarily, advanced social work practice and social welfare policy courses.

B.S.W., M.S.W., and Ph.D. Program Advisory Committee

In 2005, two advisory committees were reactivated, one for the B.S.W. program and the other for the M.S.W. and Ph.D. programs. Supervisors and some agency directors serve on advisory committees for the B.S.W. and M.S.W. programs. The Ph.D. Advisory Committee is composed of two CEOs (one from a major social welfare organization and one from a major planning and funding organization) and senior

faculty in the University. These committees make recommendations for the School's programs based on their reviews of curriculum and responses of students to exit survey questions. They also draw upon the views of alumni and field instructors, and examine curriculum in light of newly required licensure exams for social workers.

Alumni and Field Instructor Surveys

Every two years, the school conducts an alumni survey and a survey of field instructors. Alumni are surveyed to answer a number of questions that relate to curriculum, among other things. We ask them to indicate the field in which they practice (i.e., health, mental health, child welfare, family treatment), the types of positions they hold, and their perception of the strengths and weaknesses of their preparation for those fields and positions. Field instructors are surveyed to help us understand if our course work prepares students for their practical experiences in the field. The focus is on what curricular areas should be added, strengthened or changed.

Research and Evaluation with Practitioners and Community-Based Research

A significant number of faculty conduct their research and evaluation projects in partnership with agency personnel and personnel in community-based organizations. Intervention research, capacity-building and evaluation research inform both the curriculums and instruction.

Academic Program Review

Planning for Academic Program Review (APR) began in 1982 when a University-wide committee looked at ways to implement a quality review process. At the time, only the graduate programs were reviewed. The committee recommended a system for the cyclical review of all programs, which was then institutionalized in the Wayne State University Code Annotated (WSUCA) 2.43.02 — Academic Program Review. The purpose as stated in the statute was:

to assure regular review of all academic programs and units within Wayne State University to assess the quality of their undergraduate and graduate programs and their contributions to the teaching, research and service missions of the University.

These assessments of program quality should be used to assure recognition and continued support for programs which have achieved excellence, to provide leadership and assistance to those programs with high potential, and to identify and, where possible, to strengthen programs which do not meet the university's standards of excellence, and to identify programs which no longer fall within the university's missions.

APR began in earnest in 1987 and has been part of University procedures since that time.

Overview of the Process

The statute was operationalized with a set of procedures and guidelines and an Office of Academic Program Review was established in 1987. A standard procedure was established for all programs.

Self-Study

The self-study is written using a set of standardized guidelines (www.gradschool.wayne.edu/apr/index_files/Departmental_Guidelines_2006.doc). These guidelines are designed to produce quantitative data that can be analyzed quickly and consistently across programs. Departments are given six to nine months to prepare the self-study. The timeline depends on the date set for the site visit. The guidelines may be adjusted to meet the particular needs of the unit under review. These adjustments are made with the acknowledgment and approval of the Provost and administrative Dean.

Site Visit

The site visit lasts three days. The evaluators arrive on the first evening and meet to discuss their plan for the site visit. The second day they meet with the Associate Vice President for Undergraduate Programs and General Education and the Associate Provost and Dean of the Graduate School and International Programs, the Dean, Chair, faculty and students. They tour the facilities and end the day with a working dinner with the Review Advisory Panel (RAP). This part of the review process has been changed recently so that the RAP conducts their site visit on the same day as the external evaluators. In the past, they conducted a review on a separate day prior to the external evaluators' site visit.

Post-Review

When the external evaluators have completed the site visit, they are asked to write a report on what they perceive to be the strengths and weaknesses of the unit. Importantly, they are asked to identify strategies for building on strengths and for devising solutions for weaknesses. This report is then given to the RAP, which prepares its own report (www.gradschool.wayne.edu/apr/index_files/RAPPreporelectronic.doc). The RAP has the opportunity to comment on the report of the external evaluators, because the external evaluators represent a disciplinary perspective and may recommend improvements in programs that may be inconsistent with the resources, mission, and goals of the University and the department.

When the reports are submitted, the Dean and Chair (with the input of the unit faculty) are asked to prepare a report outlining the issues raised and describing the plans for addressing them. The report, called *The Dean's Strategy Report* (www.gradschool.wayne.edu/apr/index_files/page0007.htm), requests information on what resources will be redirected to address the issues and what the benchmarks and timelines for completion will be. This document becomes the working document for a meeting with the Provost, Dean, Chair, appropriate Associate Provosts and the APR coordinator. The issues are discussed and plans confirmed. New items not covered in the reports may also be discussed at this time. The final plans are drafted into an *Action Plan* by the APR coordinator, which is circulated for responses. Once everyone has agreed to the terms of the *Action Plan*, it is signed by the Provost, Dean, and Chair.

Update

Periodic requests are made by the Provost to provide a written summary of the progress a unit is making toward fulfilling the *Action Plan* strategies.

Program review continues to be a powerful tool that helps the University achieve its goal of ensuring quality educational programs that promote excellence in teaching, scholarship and service within the context of our urban environment. Program review has evolved since 1987, with a greater emphasis being placed on outcomes as a measure of a program's success.

Review and Evaluation of Graduate Academic Programs

The Ph.D. Study Commission

The Ph.D. Study Commission was established in 1998 by the Vice President for Research and Dean of the Graduate School to evaluate all aspects of Ph.D. programs at Wayne State. The Commission was charged to make a series of recommendations designed to strengthen Ph.D. education at Wayne State. The impetus for forming the Ph.D. Study Commission originated out of national, state, and local issues. On the national level, there were, and still are, debates and discussions concerning:

- The length of time to complete the degree
- Perceived over-production of Ph.D.s in many disciplines;
- Promotion of nontraditional career paths for Ph.D.s;
- International graduate students;
- Training GTAs and preparation of future faculty;
- Diversity in the Ph.D. student population;
- Reduction of graduate student stress; and
- Graduate student mentoring.

Local issues were also significant to the formation of the Commission. The history of the Ph.D. degree at Wayne State has been relatively short in comparison to most American research universities. WSU's first Ph.D. degrees were awarded 58 years ago in Chemistry, Biochemistry and Physiological Chemistry. Since 1948, the University has evolved from a city university to a large, state university with a strong urban mission and has achieved the status of RU/VH: Research University (very high research activity) under the most recent Carnegie classification system. Although great strides have been made, WSU is still an emerging research university and must regularly undergo self-evaluation and improvement if it is to continue to fulfill its goal of becoming a premier urban research university.

The core aim of the Ph.D. Commission was to identify ways to increase the competitiveness of the University's Ph.D. programs. The desired outcomes of the implemented recommendations were:

- Higher national rankings based on graduate and research programs;
- Enhanced and more broadly based extramural funding; and
- Excellent placement of WSU Ph.D. graduates.

Recommendations of the Commission

The Commission completed its report and made 29 recommendations for changes that were aimed at increasing the competitiveness of WSU Ph.D. programs. The Commission also concluded that a number of more specific goals could be achieved with implementation of the recommendations. These goals included:

- Encourage and emphasize excellent mentoring;
- Promote shortening time to complete degree;
- Facilitate making critical academic decisions in a timely manner;
- Remove barriers to interdisciplinary Ph.D. research;
- Achieve maximum program flexibility consistent with high academic standards;
- Increase the proportion of full-time, supported Ph.D. students;
- Ensure that Ph.D. programs and resources are properly aligned with the University's goals and missions;
- Improve services to Ph.D. students;
- Promote a more cohesive graduate student community and culture; and
- The recommendations fell into four broad categories: Recommendations for Changes in the Ph.D. Requirements/Practices, Recommendations Associated with Mentoring, Recommendations of a Strategic Nature, and Recommendations Dealing with Student Life and Services.

Response to the Commission's Recommendations

In 2005, six years after the Commission's report (located in the NCA Resource Library), the Credentials Committee of the Graduate Council reviewed the outcomes of the Commission's recommendations. This review is also located in the NCA Resource Library. In Table 1 of the review, the implementation status of each recommendation appears. Of the recommendations made, only three received no action (i.e., eliminate from grants and contracts the indirect cost charge for GRA fringe benefits, make available an appropriate degree option for all-but-dissertation students, and credit faculty for doctoral dissertation direction). Of the 26 that were implemented, the most significant include the Graduate Program Enhancements, the Research Enhancement Program, the Candidate Status registration system (requiring continuous enrollment during the dissertation phase), annual reviews for doctoral students, revamping the Office of Graduate Admissions, identifying more funding for graduate recruitment, improving services for doctoral students and increasing the profile of graduate education at the University.

In addition, average and median time to complete degree and time to other Ph.D. milestones were examined. These data appear in Table 2 of the review. Based on this information, the Credentials Committee concluded that significant progress had been made toward achieving the goals the Commission identified.

Evaluation of Ph.D. Dissertation and Defense

In fall 2004, two changes in the dissertation defense occurred. These changes were designed to improve the quality and evaluation of the dissertation defense. First, no longer did the Graduate School assign a faculty member who was not a member of the student's dissertation committee to serve as Graduate Examiner. The Graduate Examiner was intended to serve as an advocate for the student during the defense; however, he or she had typically never met the student until the day of the defense and had not read the dissertation. Moreover, faculty were reluctant to serve in this role, which often delayed the scheduling of the defense until

Average Ratings by Dissertation Committee Members Fall 2004 and September 2005

School or College	Overall Quality of Dissetration Defense	Overall Quality of Dissertation	Opportunity to Meet with Students Prior to Defense	Opportunity to Meet with Committee Prior to Defense
Education	1.40	1.51	1.30	1.43
Engineering	1.69	1.65	1.73	1.69
Fine Arts	1.83	1.67	1.83	1.79
Graduate School	1.13	1.25	1.00	1.38
Liberal Arts and Sciences	1.38	1.53	1.42	1.58
Medicine	1.11	1.35	1.21	1.21
Nursing	1.00	1.33	1.00	1.00
Pharmacy and Health Sciences	1.39	1.50	1.61	1.72
Total	1.39	1.52	1.42	1.53

Scale: 1 = Excellent, 5 = Poor

Table 4.1

an examiner could be identified. Finally, in at least six years, only one graduate examiner had reported a problem with the defense. Beginning fall 2004, either the student's dissertation advisor or the outside member of the committee served as Graduate Examiner. Second, evaluation of the defense and dissertation was changed to include all the members of the student's committee rather than just the Graduate Examiner. Survey questions were also changed to gather more helpful information.

A new survey containing four items was developed. Committee members were asked to rate on a scale of one to five (with one being high) the following: (1) the overall quality of the student's dissertation lecture; (2) the overall quality of the student's dissertation; (3) the opportunity to meet with the student prior to the defense; and (4) the opportunity to meet with the other members of the committee prior to the defense. The survey is e-mailed to the committee

members after the defense. Responses have been compiled for the period between fall 2004 and September 2005. The data appears by school or college in **Table 4.1**.

Generally, the quality of the dissertation defense and the dissertation were rated highly. In addition, the average rating of the quality of the defense was quite comparable to that of only Graduate Examiners under the previous system (Opportunity to Meet with Students Prior to Defense — **Table 4.1**). Interestingly, the quality of the dissertation defense itself was rated higher than the dissertation. There had been anecdotal concerns expressed prior to the gathering of this information that the quality of the defenses themselves was mediocre to poor, especially in comparison to the dissertations. The data do not support this concern. In only one college, Fine, Performing and Communication Arts, was the defense rated lower than the dissertation.

There are also indications that the students may not be meeting enough with committee members or that the committee members are not meeting enough with one another prior to the defense. This is a student mentoring issue and has been presented to graduate directors, especially in disciplines outside of the sciences (except Pharmacy and Health Sciences).

Evaluation of Ph.D. Completion Rate

Program completion is also an important indicator of quality Ph.D. programs. Ph.D. Program completion data were compiled for the University as a whole, by school or college, and by program for two cohorts of students. One cohort entered their programs between 1990 and 1993; the other cohort, between 1993 and 1996. Graduation rates were examined 10 years later for each group. In the first cohort, overall completion rate was slightly more than 45%. For the second group, completion rate had increased to slightly more than 47%. Program completion at Wayne State is comparable to rates found in other studies of doctoral completion: about half the doctoral students who enter Ph.D. programs graduate.

In a 2001 study, Lovitts (*Leaving the Ivory Tower: The Causes and Consequences of Departure from Doctoral Study*, Barbara E. Lovitts. Lanham, M.D.: Rowman and Littlefield) examined attrition in two universities, which she identified only as Rural and Urban University. For Urban University, the overall attrition rate was 68% (i.e., the completion rate 32%). Wayne State's completion rate is considerably higher.

Graduate Program Enhancement Awards

In order to improve national rankings, Provost Nancy Barrett began a strategy of doctoral program enhancements two years ago. The ultimate goal of this program is to improve the quality and public image of WSU's doctoral programs as measured in the National Research Council Survey and other rankings. We aspire to be above the median for all our doctoral programs (Chemistry, Psychology, and Biochemistry were above the median in the last ranking study.) The National Research Council (NRC) survey uses a variety of metrics to rank programs, and the Graduate School will keep a database (updated annually) to measure progress.

Each enhanced program receives \$250,000 in new, permanent annual funding. In addition to strengthening our best doctoral programs in preparation for the 2006 NRC doctoral program rankings, these enhancements are intended to expand research, retain top faculty, and attract and retain high quality doctoral students. This program also demonstrates that our resources are in alignment with the University's mission, Strategic Plan and goals. Each college is permitted one nomination for enhancement, with the exception the College of Liberal Arts and Sciences, which is allowed two. Many of the schools and colleges with multiple doctoral programs hold internal competitions for the dean's nomination. In the first year, four programs were chosen from the 10 top-ranked entries. These were Anatomy and Cell Biology, Chemistry, Electrical and Computer Engineering, and Political Science. In the second year, six programs out of nine programs nominated by their deans were selected for funding for the competition. These programs were Audiology and Speech-Language Pathology, Biomedical Engineering, Communication, Instructional Technology, Physiology (Reproductive Sciences), and Psychology. Other benefits of the program include enrollment growth, strengthening faculty and curriculum and support of infrastructure.

Top students are being recruited to these programs, and students are enthusiastic about their training. Most of the funded programs have allocated all or part of the enhancement funds to support graduate assistants. Science departments in particular had an urgent need to increase the amount of their stipends in order to be competitive. As one student in Chemistry noted, "We may not be a Big 10 school, but in terms of quality programs, we are a Big 10 program."

The enhancements have also been instrumental in improving faculty morale and promoting strategic planning within our academic departments. Successful departments show significant research potential and high enrollment relative to faculty, so value added is high.

All of the programs have earmarked some of the enhancement funds to support new faculty, and all report that the enhancement funding has strengthened their ability to compete for top faculty. Two of the enhancements have led to interdisciplinary Ph.D. programs or concentrations (Vision Sciences and Reproductive

Sciences). These new training efforts have combined basic science and clinical programs and improve our competitiveness in the new Clinical and Translational Science Awards Program, an important initiative developed from the NIH “Roadmap” to increase “bench to bedside” research and training.

Summary and Evaluation

Wayne State offers myriad opportunities for students to become prepared for full participation in a global, technological society, as described in Criterion 4b and 4c. We have outlined a sampling of the numerous study abroad programs available to students and faculty and have highlighted the establishment of an Office of International Programs as a means to promote and coordinate these programs. We have also described programs in which students can become familiar with diverse cultures closer to home through work in the Detroit community. Indeed, our Detroit location is one of our major strengths, providing familiarity with both the problems and challenges of urban America in the 21st century, as well as the cultural and artistic richness of a major metropolitan area. We also have presented examples of how we use our technology transfer and commercialization initiatives as a vehicle for student learning and participation.

The results from the NSSE survey demonstrate that our efforts and environment help to prepare students for the broader world. Compared to other urban universities as well as graduate extensive (GE) universities, WSU students attend cultural events and campus events as often or, in some cases, more often than undergraduates elsewhere. They also report similar or greater participation in voting, in coming into contact with people of different origins and in learning to appreciate the ethics of others. All of these questions relate to lifelong learning objectives and to preparation for living in a diverse and global society.

An excellent example of our in-depth concern with the quality of knowledge and skills in our programs is the work of the Ph.D. Commission. Of 29 recommendations, 26 have been implemented, indicating the willingness of the faculty to make changes as necessary. The separation of the Graduate School from the Office of the Vice

President for Research in 2001 has led to greater focus on graduate education, as reflected in the outcomes of the Ph.D. Commission. Other indicators of our desire for high-quality intellectual inquiry are the Graduate Program Enhancement awards the Provost made in the last three academic years. Even though a reduction in state funding has increased our financial challenges, the President and Provost have ensured academic excellence through \$250,000 recurring awards to the departments of Anatomy and Cell Biology, Chemistry, Electrical and Computer Engineering, Political Science, Audiology and Speech-Language Pathology, Biomedical Engineering, Communication, Instructional Technology, Physiology and Psychology. These enhancements have strengthened faculty, curriculums and infrastructure, and generated an increase in enrollment.



4d. The organization provides support to ensure that faculty, students, and staff acquire, discover, and apply knowledge responsibly.

Wayne State has highly refined policies and procedures in place to ensure that students and faculty adhere to ethical and professional standards in their study, teaching, and research. Administration of these policies and procedures is spread across various levels of the University, and the entire University community has clearly defined responsibilities in upholding ethical standards.

Academic Dishonesty

WSU students are made aware of the University's policies, procedures and expectations in regard to academic integrity. The Student Code of Conduct is distributed throughout the campus in print form and on the web. Student Judicial Services, which is linked to the web page of the Dean of Students (www.doso.wayne.edu) drives home the point quite clearly for students and faculty:

- Academic dishonesty means any activity that tends to compromise the academic integrity of the institution or subvert the education

process. All forms of academic dishonesty are prohibited at WSU, as outlined in the Student Code of Conduct.

- Students are expected to be honest and forthright in their academic studies. Students who commit or assist in committing dishonest acts are subject to downgrading and/or additional sanctions as described in the Student Code of Conduct. Faculty and students are responsible for knowing the different forms of academic dishonesty as well as for being aware of the Student Code of Conduct.
- It is important that each of us share the responsibility for maintaining a reputable University committed to academic honesty among students by including a statement in the course syllabus and by discussing issues such as cheating and plagiarism.
- Similarly, students should protect themselves by thoroughly studying and preparing for tests and assignments and by discouraging dishonesty among other students.

The document spells out various forms of academic dishonesty to clarify any misunderstanding students may have:

- Cheating: Intentionally using or attempting to use, or intentionally providing or attempting to provide, unauthorized materials, information or assistance in any academic exercise.
- Fabrication: Intentional and unauthorized falsification of any information or citation.
- Plagiarism: To take and use another's words or ideas as one's own.
- Other: Other forms of academic dishonesty include, but are not limited to, the following:
 - Unauthorized use of resources, or any attempt to limit another student's access to educational resources, or any attempt to alter equipment so as to lead to an incorrect answer for subsequent users. Enlisting the assistance of a substitute in the taking of examinations.
 - Violating course rules as defined in the course syllabus or other written information provided to the student.

- Selling, buying or stealing all or part of the unadministered test or answers to the test. Changing or altering a grade on a test or other academic grade records.

Maintaining Academic Integrity

The Office of the Provost, in conjunction with the Office for Teaching and Learning (OTL), has published a pamphlet on Academic Integrity that spells out the process for dealing with situations involving dishonesty. A copy of this pamphlet can be found at

www.otl.wayne.edu/cheating.html.

Other resources for students to support academic integrity include:

- WSU Writing Center (www.english.wayne.edu/writing)
- The Academic Success Center (www.success.wayne.edu)
- Ask a Librarian (www.lib.wayne.edu)

A Cooperative Approach to Academic Integrity

WSU provides faculty with guidance and resources to deal with ethical issues, principally plagiarism, in the classroom. The Office for Teaching and Learning (OTL) has convened a working group to help create resources to prevent or detect cheating. The objective of the group is to determine the issues of most importance to both faculty and students, ways to systematically approach them so that students and faculty work together to avoid problems, and to develop an outreach program so that all information is disseminated appropriately. To meet objectives, the committee has proposed different strategies for faculty, student, and parent outreach.

Faculty Outreach: OTL in conjunction with Computing and Information Technology (C&IT), developed a Blackboard™ site containing research and informational articles, methods for detecting and preventing cheating and plagiarism, and procedures for handling situations where students have cheated or plagiarized. This site is also designed so that faculty can share experiences and resources via the discussion board. In addition to the Blackboard™ site, OTL is planning to develop a website for all faculty to access

information on appropriate handling of cheating and plagiarism.

Some faculty have piloted a plagiarism detection software program called SafeAssignment. Faculty involved in the pilot completed training for effective use of the software. They also completed an evaluation of their experience and gave their opinions regarding cheating and plagiarism. Training consisted of lists of strategies, resources and methods of developing assignments to prevent cheating in the first place. Faculty who participated in this pilot gave a follow-up evaluation that was compared to evaluations of a different program tried by other faculty. Results are currently being analyzed.

Student Outreach: The WSU Library System, in conjunction with OTL, has been working to create training modules to help students better understand citing, referencing and resources. In addition, the new Academic Integrity brochure referenced above was created to be given to student leaders and new students at New Student Orientation. The brochure lists strategies to prevent cheating and plagiarism, consequences if a student is caught, and resources to help students avoid using inappropriate strategies.

A representative from OTL also met with student leaders to talk about how to help students avoid inappropriate choices when they find themselves in difficult situations. Student leaders were encouraged to share information on good learning strategies and available resources. They were also given information on student rights when accused of cheating or plagiarizing. Feedback on student perspectives regarding this issue will help OTL staff in preparing future presentations.

Parent Outreach: OTL staff present information to parents on how to help their children avoid inappropriate choices and how consequences of cheating can affect a student's academic career. OTL staff meet with parents during orientation, and parents are given the brochure on academic integrity. Parents are also given strategies they can use to help their children make the transition to college.

In addition to these informational activities, many classes discuss professional ethics in their curriculum. Examples include:

- Library and Information Science
LIS 6010 — Introduction to the Information Profession
- Pharmacy Practice
PPR 5280 — Ethics/Professional Responsibility
PPR 6180 — Advanced Ethics and Responsibility
- Communication
COM 5030 — Communication Ethics
- School of Medicine
BMS 6010 — Integrity in Research: This is a cross-college course with faculty drawn from the departments of Philosophy, Biological Sciences and English.

In addition, the departments of Philosophy and Political Science offer courses dealing entirely with ethical issues.

WSU's Office of Technology Commercialization involves students as well as faculty in issues of intellectual property rights and has instituted policies and procedures that address this area of academic integrity.

Research and Academic Integrity

WSU is committed to providing students a user-friendly, informed research environment based on the highest professional and ethical standards. Federal, state, and local agencies regulate research here, as elsewhere. Federal regulations require that before beginning any human participant or animal research, one must obtain approval from the appropriate University review committee. Research data cannot be used if permission is not obtained from the Human Investigation Committee (HIC) or Animal Investigation Committee (AIC) before beginning the project. Other disciplinary actions may also apply to cases of noncompliance with this requirement.

Research on human subjects is defined as a systematic investigation, including research development, testing, and evaluation designed to develop or contribute to generalized knowledge. Research using animals is defined as a systematic investigation, including research development, testing, and evaluation designed to develop or contribute to generalized knowledge, research

training, experimentation or biologic testing for related purposes.

For more information, please visit these websites:

Office for Research Compliance
(www.research.wayne.edu/compliance)

Graduate School (www.gradschool.wayne.edu)

Animal Investigation Committee
(www.aic.wayne.edu)

The HIC and the Graduate School publish very specific ethical standards for the benefit of all faculty and students involved in research at Wayne State.

Ethics in research is a fundamental element of the student experience at Wayne State. The Office of the Vice President for Research (OVPR) is dedicated to fostering a University-wide environment of research integrity through its research compliance office, administered by the Assistant Vice President for Research. The Office of Research Compliance (ORC) oversees all areas of research compliance, including research that utilizes humans, animals, DNA, radiation safety, and chemical safety. It coordinates conflict of interest and export controls and handles inquiries and investigations regarding allegations of scientific misconduct. The ORC provides leadership and management to select units within the OVPR, including the Human Investigation Committee, the Animal Investigation Committee and the Office of Environmental Health and Safety.

In keeping with its dedication to the highest levels of education and research integrity, all research at Wayne State is conducted in accordance with the principles of the *Belmont Report* and other ethical codes of conduct for research, such as the *Declaration of Helsinki* and the *Nuremberg Code* and within the framework of the *Code of Federal Regulations* (45 CFR 46; 21 CFR 50; 21 CFR 56; 38 CFR 16; 7 USC, 2131-2156; 9 CFR 1-A). Wayne State has made a commitment to conduct all research, regardless of sponsorship, under these regulations in order to provide the highest level of protection for all human and animal subjects.

The Office of Research Compliance promotes responsible conduct that will provide benefits to students in all aspects of their lives. In a

more direct way, the oversight, education and training of faculty and students in the conduct of ethical research is a major function of the ORC. The training emphasizes that ethical conduct is fundamental to conducting good research and prepares researchers to meet federal, state and local compliance regulations through its training modules and University-wide workshops. Central to the dissemination of information concerning research compliance is the comprehensive ORC website. Directly linked by a tab at the top of the Research website, the Compliance web page contains links to all units under the authority of ORC and the Responsible Conduct of Research Training Modules (www.research.wayne.edu/compliance). Those links provide necessary policies and procedures, forms, regulations, regulation updates, current information, and contact numbers.

WSU is currently seeking accreditation with the Association for the Accreditation of Human Research Protection Programs (AAHRPP) and has been accredited by the Association for the Assessment of Laboratory Animal Care (AALAC) since 1977. Accreditation by these respected national organizations demonstrates that WSU conducts its research at levels that surpass minimum regulatory requirements. This commitment to excellence and integrity in research, and the prestige that it brings, results in WSU's ability to attract excellent faculty, students and sponsors, all of which enrich students' educational experience and results in better opportunities upon graduation

Human Participant Research

Wayne State operates its human participant research programs under a Federal Wide Assurance (FWA) with the Department of Health and Human Services. In accordance with this FWA, the Human Investigation Committee (HIC) is the primary Institutional Review Board (IRB) for WSU and its affiliated health care institutions.

The Human Investigation Committee (www.hic.wayne.edu) is given the responsibility to oversee the approximately 2,500 active research protocols from WSU and their health care affiliates. The HIC is comprised of four IRBs and a steering committee, which consists of the chairs and vice chairs of the four IRBs, one elected member from each IRB, several appointed

members and the Assistant Vice President for Research at WSU.

Since implementation of the Human Subjects Training Module (www.rcr.wayne.edu) in September 2000, over 7,360 student and faculty researchers have completed the required training modules on responsible conduct of investigations involving human subjects. Research protocols will not be approved until the principal investigator and all key personnel have successfully completed the six mandatory modules and the three supplementary modules if required.

Essential to this process is the overview and mentorship by department chairs, student advisors, and faculty who supervise and mentor students. The faculty supervisor and department chair/dean, who verify that the scientific merit of the research and all space and funding requirements will be met, must approve research protocols.

Education Coordinator: Key to the success of Research Compliance is the educational component. The Educational Coordinator keeps faculty and student researchers apprised of policy and regulations via group or individual training, keeps the website and training modules updated, holds seminars and classroom lectures when invited and provides personal assistance in response to human participants' questions.

Pre-reviewer: The Pre-Reviewer is available to human participant researchers to assist them with protocols. This provides individual training and streamlines the process of approval.

Community Liaison: WSU's Research Compliance Office also includes a community liaison that organizes and initiates community outreach, makes presentations explaining research compliance to the community and undergraduate students and provides formal instruction sessions for investigators and their research staff regarding the public's concerns and questions.

Conflict of Interest: WSU has also been one of the leading innovators in institutionalizing a Conflict of Interest program and committee to aid in resolving issues of potential bias in research. The WSU Conflict of Interest policy establishes standards and provides oversight to insure that there is no reasonable expectation that the

design, conduct or reporting of funded research or cooperative agreements with companies will be biased by any conflicting financial interest of WSU employees, students or immediate family members.

Coeus IRB: On June 15, 2005, the Human Investigation Committee implemented a new database, Coeus IRB, to manage all IRB administrative activities. The innovative web-based system was developed by MIT with input from a steering committee of users that includes WSU. The system streamlines and makes more efficient the internal processes of HIC. With future updates, it will allow the submission of protocols and authorize users to submit and track conflict of interest, proposal, and protocol information.

Animal Research

The Animal Investigation Committee (www.aic.wayne.edu) is the Institutional Animal Care and Use Committee for WSU. In cooperation with research scientists and veterinarians, the AIC ensures that all research and teaching protocols using live vertebrate animals are designed and carried out in a humane manner that complies with all applicable laws, policies and guidelines.

The AIC operates under an Animal Welfare Assurance and has been accredited by the Association for the Assessment of Laboratory Animal Care (AALAC) since 1977. No animals can be purchased or used in experimental procedures without written AIC protocol approval and successful completion of the Animal Subject Training.

Animal Subject Training (www.rcr.wayne.edu) WSU is one of the few institutions with web-based training modules in this area. Over 2,971 faculty and students performing research on animals have successfully completed these training modules. The AIC interacts with the Division of Laboratory Animal Resources (DLAR) to ensure that each research/teaching protocol is in compliance with all applicable laws, policies, and guidelines. Informational, species-specific and procedure-specific training sessions for principal investigators and research personnel are presented by the AIC and DLAR at various times throughout the year. Training is also available on an individual basis.

Division of Laboratory Animal Research (DLAR): The DLAR operates all animal housing sites on campus and at the John D. Dingell Veterans Administration Medical Center. This unit is committed to providing an environment that promotes quality biomedical research and is entrusted with humane and responsible veterinary, technical and husbandry support of all animals utilized in research and teaching. This is accomplished through professional consultation and assistance and primarily through education and training (www.dlar.wayne.edu/training). DLAR also requires a class in species-specific research and Rodent Survival Surgery is required for principal investigators and staff according to the nature of the project(s) involved.

Data Ownership

In May 2006, the Office of the Vice President for Research established guidelines regarding Research Data Ownership. The purpose of these guidelines is to clearly state that the University has the rights to, and responsibility for, research data generated by its employees, students, staff or affiliates. The University is accountable for the preservation and integrity of research data even if its creator(s) has/have left the institution. All research data generated with University support are owned by the University. It is essential to retain data ownership in order to fulfill the institution's legal and institutional responsibilities, to protect intellectual property rights, to manage research programs, to meet regulatory requirements, and to prevent or investigate allegations of scientific misconduct. Further information about these guidelines can be found at www.research.wayne.edu/compliance/data_ownership_5_2_062.pdf.

Environmental Health and Safety (OEHS)

The Office of Environmental Health and Safety (OEHS) (www.oehs.wayne.edu) is a department within Research Compliance and provides students with an enriched learning experience by maintaining a safe and healthy work and learning environment throughout the University. OEHS provides oversight of the emergency and safety procedures and the education of the University community about occupational and environmental health and safety issues. This office provides professional services in the

areas of hazardous waste minimization and disposal, biosafety, food safety, pest control, indoor air quality, health and safety training, and consultations.

The Vice President for Research, the Assistant Vice President for Research and the Director of Environmental Health and Safety/Health Physics have permanent seats on the Institutional Biosafety Committee (www.oehs.wayne.edu/committees.html) and the Radiation Safety Committee (www.oehs.wayne.edu/committees.html) that have oversight and review authority over the safety of biological and radiation research. These collaborative efforts ensure that there is shared knowledge and oversight between the divisions of Research Compliance HIC, AIC and OEHS and that all areas are in compliance with local, state and federal public health regulations. OEHS also provides training for faculty and students that includes, but is not limited to, the following:

- Radiation Safety (www.oehs.wayne.edu/OEH&S/radtraining.html)
- Blood-Borne Pathogens (www.oehs.wayne.edu/bbplabs/training.htm)
- Laboratory Safety (www.oehs.wayne.edu/OEH&S/training.html#OSHA%20Laboratory)
- Bio-Safety Program (www.oehs.wayne.edu/oeh&s/biosafet.htm)
- Right to Know (www.oehs.wayne.edu/oeh&s/rtkprog.html)

Scientific Misconduct

WSU supports the responsible conduct of research by maintaining the integrity of the research record, thereby protecting students and faculty from scientific misconduct and reinforcing the University environment of academic integrity. The Research Compliance Office reviews and has oversight of policies and procedures that govern incidents of fabrication, falsification, plagiarism or other practices not commonly accepted within the scientific community and handles inquiries and investigations regarding allegations of scientific misconduct (www.research.wayne.edu/compliance/misconduct.html). Pamphlets are available that describe the policy and list contacts to ask questions of or report

suspected misconduct. The policy and contact numbers are readily available on the Research Compliance website (www.research.wayne.edu/internaldocs/WSU_Scientific_Misconduct.pdf).

Research Safety

Along with the ethical conduct of research, WSU has an obligation to its faculty, students and staff to ensure that the laboratory environment is safe and hazard-free. WSU has a School of Medicine and a graduate medical education program with varied research activities that involve many locations. While WSU has substantial affiliations with health care institutions within the Detroit Medical Center (DMC), the affiliation agreements are negotiated in such a way that all research activities are conducted under the responsibility of WSU. Individuals within the DMC who are participating in research do so as part of their WSU faculty responsibilities. WSU maintains a separate affiliation with the John D. Dingell Veterans Administration Medical Center (VAMC); however, at the VAMC, animal maintenance and veterinarian care is provided by WSU's DLAR. VAMC principal investigators must have WSU appointments.

Within the University, all service units that provide research-related activities ultimately report to the Vice President for Research. These units include Sponsored Program Administration, Animal Investigation Committee, Division of Laboratory Animal Resources, and Environmental Health and Safety. Radiation safety is a component of the Office of Environmental Health and Safety. The WSU Office of Risk Management and the Division of Human Resources report to the Vice President, Treasurer and Chief Financial Officer for Finance and Facilities Management.

Safety for employees is a shared responsibility among the following entities:

- Principal and co-investigators — Investigators are responsible for identifying occupational hazards, minimizing risk in their work environment, ensuring compliance with program requirements and ensuring that all their employees have been properly trained and equipped to perform their job duties safely.
- Animal Contact Personnel — Individuals involved with WSU animal research and teaching programs are responsible for identifying and reporting unsafe working conditions to their supervisor or principal investigator, complying with occupational health requirements (e.g., health and risk assessments) and complying with all other institutional health and safety policies and procedures.
- The Office of Environmental Health and Safety (OEHS) — This office is responsible for training related to general laboratory safety, certain equipment inspections and training on the appropriate method to use, store and dispose of hazardous chemical and biological agents. It is responsible for compliance with federal and state policies, procedures and regulations. Within OEHS, Health, Physics and Radiation Control is responsible for training and certifying that individuals can handle radioactive materials safely and that the products are stored properly and disposed of in accordance with federal and state requirements.
- The Division of Laboratory Animal Research — This unit operates the animal housing sites on campus and procures all research animals. DLAR is responsible for maintaining a safe working environment for employees and students within the division. DLAR is also responsible for providing education and training to personnel on the care and use of animals in research and teaching, including safe animal-handling techniques.
- The Animal Investigation Committee — This unit reviews and approves all activities involving vertebrate animals, inspects all facilities in which animals are held, and oversees the entire program for the use of animals in research and education at WSU and its affiliated health-care institutions. As part of the semi-annual inspection, AIC observes safety issues within all laboratories that use animals.

Of particular concern are safety issues related to exposure to animals. To address this concern, and as a result of a task force authorized by WSU's Vice President for Research in 1999, the Animal

Contact Occupational Health Program (AniCon) protects the health and safety of all individuals who come in contact with research animals at WSU. This program addresses the occupational medicine health needs of individuals who come in contact with animals.

A full-time WSU Occupational Health Nurse Specialist performs periodic health screenings, provides training, education, and counseling and reviews questionnaires for medical relevance. The medical surveillance program includes an initial risk assessment questionnaire. Depending upon the occupational risks and baseline health status, some individuals are referred for an examination, additional medical screening or testing (e.g., audiogram, pulmonary function testing, blood tests), vaccinations, titres and/or tuberculosis screening. Periodic risk assessment questionnaires and/or medical evaluations may be indicated to detect interval changes in health status. Additional episodic evaluations might result from special concerns (e.g., pregnancy, immunocompromised states), symptoms or health problems thought to be related to the work environment.

A database maintains risk assessment questionnaire data and generates reports that result in appropriate referral for medical services, as well as summary statistics. Medical records are kept confidential in compliance with OSHA and ADA requirements. The database is also password and firewall protected.

The Animal Contact Occupational Health Program (AniCon) is reviewed annually.

Summary and Evaluation

The University has a long history of ensuring the application of ethical and professional standards in studying, teaching, and research. Policies combating academic dishonesty are well developed and scrupulously applied. Students are given guidance in how to proceed with their work in a way that will maintain academic integrity. Many units offer course work in ethics and professional responsibilities. The U.S. Department of Health and Human Services approved the human and animal investigation committees. All faculty and students must adhere to the practices mandated by these committees and are provided with online training to help them do so. Lastly,

research safety is an important element of faculty, student, and staff behavior.

The University is cognizant of the need to ensure that research involving animal and human subjects is done under the most favorable conditions possible. The Association for the Assessment of Laboratory Animal Care (AALAC) recently recertified the Division of Laboratory Animals (DLAR). DLAR has been accredited since 1977. We are also in the final stages of applications for accreditation by the recently established Association for the Accreditation of Human Research Protection Programs (AAHRPP), and expect to be site-visited by that organization in early 2007. Accreditation by external boards is seen as major validation of the quality of our compliance programs and research facilities. It also assures that our students begin their research careers with the principles of humane respect for research subjects as a guiding ethic.

