DOUBLING RESEARCH: FINAL REPORT

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Task Force Report on the Doubling of Research, Scholarly and Creative Activity

Chancellor Bantz charged the task force to develop a plan to double IUPUI's research, scholarly and creative activities in conjunction with parallel efforts to double graduation rates, civic engagement, and diversity by 2010. While this represents a significant challenge, it also matches the aspirations of most people employed or associated with the campus.

During the past 10 years, our research and sponsored funding has grown by a factor of 2.7. This includes a major gift of $155 million from the Lilly Endowment to support the Indiana Genomics Initiative (INGEN). Without this one time gift, the growth rate is 2.21 over the past 10 years. In 2003, grants and contracts totaled $215.9 million plus a one time grant of $50 million from the Lilly Endowment for the INGEN project. The School of Medicine experienced the largest gains due, in part, to a doubling of the NIH budget. During the past ten years, grants and contracts for the Medical School researchers increased by a factor of 3.2.   It is readily apparent that the Medical School is by far the largest contributor to our external funding and will no doubt remain so. It is also important, however, to realize the potential of all other schools for increasing their external funding.

To increase our sponsored funding to $430 million by 2010 will require changes in a number of current practices as well as significant investments in various aspects of campus research endeavors. While it is inappropriate for the task force to micromanage a doubling initiative, it is our objective to provide a framework for how the doubling may be accomplished.

The "Productive Investigator and Scholar" is the engine that drives the research enterprise at any university. The existence of all research-related activities and offices on campus depends on the continued success of the investigator in obtaining and maintaining external funding. Without the investigator/scholar there is no

need for animal care facilities (e.g. LARC), a biosafety office, an Institutional Review Board, a Research and Sponsored Programs office, laboratory research space, research centers or research cores. Accordingly, in order to increase research productivity, we must create an environment that allows us to recruit and retain productive investigators. This will require that we provide the necessary space, technology, information resources, tools, support structure, and incentives to maximize the abilities of our investigators. The Task Force on Doubling Research has explored many ways in which this can be accomplished. Judicious investments will have to be made together with revisions of existing policies and practices.

Recruiting outstanding research investigators: As stated above, productive research investigators and scholars are the core of a vibrant research university. We are fortunate to already have many outstanding investigators amongst our faculty. However, it is clear we need to have a greater proportion of our faculty actively engaged in scholarship and research and seeking external funding to support these efforts. For many of the IUPUI schools, this will mean filling available faculty positions with individuals who have the appropriate training and interests to engage in productive research and scholarship. For the School of Medicine, this will mean recruiting more individuals who are willing to support themselves with external grant funding. The recently approved appointment classification of the Research Professoriate series for the School of Medicine should facilitate movement toward this goal.

Supporting the New Investigator – In order to support the new investigator and maximize the establishment of a productive research career, we need to provide competitive faculty work arrangements, set-up packages, research initiation grants, proposal development services, and mentoring. We need to recruit new faculty who exhibit high potential of being leaders in their discipline. Tenure decisions for faculty whose area of excellence is research and scholarship should be based on accomplishments demonstrating a trajectory toward national/international prominence in their discipline.

> **Faculty Work Arrangements:** Faculty work should be organized to allow new investigators the time needed to establish a research career through publication and grant writing. While the specific arrangements for individual faculty will vary across schools, schools may wish to release new research faculty from service and/or teaching responsibilities early in their careers at IUPUI. in order to encourage new faculty to reach the highest level of research productivity as early as possible.

> **Set-up Packages**: New investigators expect the university to provide the instrumentation, computers and operating funds necessary to successfully compete for external funding. The funds required to support the new investigator/scholar will vary amongst schools and will be highest in those schools involved in bench (wet laboratory) research. It should be noted that these are the same schools that have the greatest opportunity to obtain significant external funding which generates indirect cost revenue for the School and the University. One way to limit the need for large set-up packages is to provide a wide range of core facilities.

> **Research Initiation Grants:** In the current funding environment, it is essential that we do everything possible to help our investigators be competitive. To successfully obtain external funding not only must the investigator/scholar present an exciting idea, but the capacity to execute the proposed work must also be demonstrated. Preliminary data are generally required to demonstrate to grant reviewers that the proposed work is feasible. The establishment of a campus-level competitive funding mechanism to support investigators while they acquire preliminary data in support of an external grant application that is either pending or in preparation would be valuable.

> **Mentoring:** All new investigators should be encouraged to select a senior investigator who will serve as a mentor and help them launch their career of research and scholarship at IUPUI. The task force recognizes that mentoring is a large responsibility for the senior investigator/scholar and hence the act of mentoring must be recognized within the faculty reward structure in a substantive and measurable

way. The success of the mentee (grants and papers) should also accrue, in part, to the mentor.

Supporting the Established Investigator

Proposal Development Services: All investigators and scholars would benefit from assistance in identifying appropriate agencies interested in supporting their research activities. In addition, many investigators would be advantaged by assistance in writing competitive grant proposals. Although IUPUI currently has such a service available on campus, too few faculty take advantage of this resource. One of the limiting factors has been the absence of funds to support faculty attendance at summer workshops on proposal development. Deans are encouraged to make this program available to all faculty.

Provide Incentives for Success and Risk-Taking: IUPUI needs to provide incentives for successfully obtaining external funding and rewards to individuals who accept the risk of relying on external support for all or part of their salary. Data from other universities demonstrate that a higher success rate in obtaining external funding is achieved when rewards are provided. The task force recommends that the IUPUI schools consider the following approaches to providing rewards for grant success and risk-taking, though a uniform approach for the entire campus would be ideal.

1. Make transparent how the Facilities & Administrative (indirect) costs that accrue to the University are used. One approach to rewarding grant success is to return a portion of F&A recovery to the units that generated it, and ideally, to the investigators that generated it. Presently the practice of returning indirect cost recovery funds to the investigator varies widely amongst the IUPUI schools with some schools returning no funds while others are returning up to 15% of the earned F&A to the investigator. It is recommended that F&A funds also be used to provide support services that directly benefit the investigator's research activities.

2. Provide standard course release time based on demonstrated research productivity.

3. Provide a cash bonus to investigators based upon their success in obtaining grants. Such bonuses cannot be charged to grants, but could be paid from salary savings, F&A income, or other departmental resources. Care must be taken not to allow such a bonus system to undermine the value of teaching or service responsibilities.

4. Provide Bridge Funding: The growth in the NIH budget has slowed dramatically in the past year and is likely to be flat for the next several years. Hence, new grants and competing renewals of existing grants are becoming more difficult to obtain. All investigators need to have "bridge funding" available and this can be accomplished in several ways. One approach would be to create a University-level competitive funding mechanism that can provide the investigator with "bridge" funding and the opportunity to continue productive research during the time that competitive, but imperfect grants are revised and resubmitted for external funding. Another approach would be to allow a portion of salary savings to be returned to the investigator to be used in the investigator's research activities or saved for the purpose of covering potential future lapses in external funding. Unused salary savings would be returned to the department when the investigator retires or leaves the University.

Support New Research and Scholarship Initiatives: It is equally important to provide access for established investigators to research initiation grants as it is for new investigators. Established investigators are not allowed to use external funding to initiate projects outside the scope of their current grants. Thus, IUPUI must establish a competitive University-level funding mechanism to allow established investigators to initiate new projects and generate preliminary data to support new grant

applications and to support collaborative initiatives.

Provide Access to Core Research Facilities and Technologies: One of the advantages afforded by the INGEN grant has been the establishment of a variety of research core facilities that contain state-of-art instrumentation, cutting-edge technologies, and staff expertise. Investigators can make use of these facilities which would be prohibitively expensive to create within their own laboratories. Judicious addition of other specialized facilities should be pursued, especially when they directly enhance the research activities of high priority programs. It is important to have a process that regularly assesses the value added by specific core units. Cores that continue to provide cutting edge technology or cost efficiencies should be sustained, while those whose services are available commercially with appropriate quality and cost should be closed. A number of other research support services need to be subsidized by the University in order to allow new and established investigators to remain competitive in today's research environment. University support will be especially important for schools that don't have the needed infrastructure to support development of research. Support needs to be provided in the following areas:

1. Provide statistical, informatics and assessment consulting during grant preparation
2. Reduce animal care costs - it should be noted that the costs at IUPUI are higher than those found at comparable institutions.
3. Provide clinical research support services
4. Enhance the existing, and establish new, relationships with government, corporate, and civic organizations to facilitate community-focused research and scholarship
5. Expand technological resources to support research and scholarship (e.g. high performance computing, electronic and tele-conferencing facilities for inter-campus and inter-university collaborators)
6. Cultivate and maintain technologically-trained, and well-compensated professional staff to assist investigators and scholars in the research enterprise
7. Provide low-cost electronic and physical resources to investigators for the secure storage of archival data and documents created through research and scholarship

Enhance Core Research Services: Investigators need access to high quality research services for grant preparation and dissemination of findings Changes are needed to:

1. Insure that library and information resources receive adequate funding to acquire materials in support of new and expanding research initiatives
2. Foster the use of campus-based, low-cost, professional visual media services to effectively communicate research findings and to promote the research institution

Revise Research Support Services: Every research support service should be examined, with input from the research investigators and staff, in order to identify ways to make the services more user friendly and to minimize unnecessary burdens. An initial examination by the Task Force has identified several areas in which changes need to be made:

1. Streamline administrative processes and minimize excess paper work and information gathering in several research-related areas such as biosafety, and animal care and use.

2. Provide adequate staffing within schools and within the Office of Research and Sponsored Programs to assure proposals are submitted on time. Retrain existing staff and hire additional staff (perhaps funded by the F&A income) to prepare and process all portions of grant applications except those describing the science. This support may be provided at the school or campus level or both.

3. Provide computer-based technologies for efficient management of workflow to support the

research grant application, preparation, and submission process.

Increase the number of undergraduates participating in research and scholarship activities:
Undergraduate research and scholarship enhances the learning experience of the student and increases their competitiveness for placement in the workforce, graduate programs, or professional schools. At the same time, undergraduate research enhance the productivity of the research investigator and students with undergraduate research experience can then be recruited into the IUPUI graduate programs.

Increase the number of graduate students and postdoctoral fellows participating in research and scholarship: Graduate students and postdoctoral fellows are key elements of a robust research and scholarship program. Their creativity and energy often help push the boundaries of discovery and analysis. To prepare students to have successful careers in research and scholarship, they need to be provided with opportunities to participate in multidisciplinary or interdisciplinary programs.   It is recommended that IUPUI increase the number of graduate student fellowships to allow for recruitment of high quality students. We also should judiciously add new interdisciplinary graduate programs.

Promoting Collaborations: Collaborative research has advanced many fields of research and scholarship during the past decade. For IUPUI to fully realize its potential we must facilitate greater engagement in collaborative research. This should occur among schools on campus and with colleagues on the IUB and PU-WL campuses.

Facilitate collaborations among existing IUPUI centers: The mission-focused nature of research and scholarship being carried out at IUPUI is not surprising given its central geographic location in the State and the prominent role that faculty and staff play in economic and community development of the region through pre-professional and professional education programs. Over the years, six major areas of research and scholarship have emerged at IUPUI with demonstrated scholarly excellence 1) basic life science, 2) applied life and health science, 3) informatics and technology, 4) physical and environmental science, 5) public policy and applied social research, 6) community arts and humanities, and 7) the scholarship of teaching and learning. While these categories do not capture all of the high-quality work being conducted by IUPUI faculty and staff, they do represent areas where large numbers of faculty and staff are working, where significant accomplishments have been demonstrated, and where IUPUI faculty and staff are likely to be particularly successful in seeking external funding in the future because of the concentrated expertise and growing reputation of scholars in these areas.

It also important to understand that while basic and applied life and health sciences represent a major focus of the research and scholarly activity at IUPUI, these domains are connected with the other domains both in terms of work that overlaps in substantive ways and in terms of collaborations among scholars from different areas of excellence. These relationships, as well as the prominence of basic and applied life science, are depicted graphically below. Indeed, much of the ongoing work being carried out in the major schools within IUPUI can be classified as falling into one or more of these areas). While this diagram, and the notion of domains of excellence in research and scholarship, focuse attention on a limited number of areas, it is important to recognize the potential for the development of new areas of excellence in a comprehensive research institution.

Currently, at IUPUI, there are a number of examples of ongoing multidisciplinary and interschool research activities and centers as diagrammed above. Among the most well known of the multidisciplinary centers are: the IU Center for Aging Research; the Center on Philanthropy at Indiana

University, Indiana University Center for Bioethics; the Bowen Research Center; and the Bio-Mechanics Research Laboratory. There are also a number of other formal entities on campus which have been the site of interdisciplinary and multidisciplinary research, including the Polis Center, the Indiana University Public Opinion Laboratory, the Institute for American Thought, the Social Work Research Center, the Center for Urban and Multicultural Education, and the Center for Enhancing Quality of Life in Chronic Illness. Other research efforts have been supported by private foundations such as the Walther Cancer Institute. There have also been a number of less structured faculty collaborations on specific projects that cut across schools and/or departments. Indeed, many of IUPUI's existing centers developed as a result of faculty collaboration on specific projects that nurtured an interest group and provided infrastructure to get the centers started.

Given our principal aim to double research, scholarship, and creative activity at IUPUI in the next seven years, a particularly promising strategy would be to target existing areas of excellence in research and scholarship for further development in order to take advantage of emerging opportunities to serve local and regional needs. While this is clearly being undertaken in the graduate and professional schools, we must work to more fully incorporate IUPUI faculty in units serving undergraduates. By carefully connecting these existing domains of excellence in research and scholarship with IUPUI's overall mission to the serve the local, state, and national community, we may also help to generate a synergy at IUPUI that will motivate faculty to engage in more creative and scholarly activity and define the role of IUPUI in the region and nation more clearly.

While there are a variety of mechanisms that could be employed to facilitate collaboration among faculty , a central aim should be to bring faculty together to regularly discuss common interests and possible collaborations and to seek external support for projects. In this regard, we recommend the creation of campus-wide initiatives targeting the existing domains of excellence in research and scholarship in order to bring together existing centers as well as individual faculty to generate interest in carrying out collaborative inter- and multi-disciplinary research, scholarship, and creative activity OK The focus of each initiative is intentionally broad to create the largest umbrella possible while still facilitating the development of a focused area of activity.

Foster collaborations with IUB and PU-WL: With the number of internationally recognized researchers located at IUB and PU-WL, every effort should be made to encourage collaborations between these campuses and IUPUI investigators. There are unlimited possibilities of creating unique new multidisciplinary collaborations by linking our great strengths in basic life sciences, and applied life and health sciences, coupled with information technology, public policy and applied social sciences, physical and environmental science, and community arts and humanities with researchers located at IUB and PU-WL.

Enhance the diversity of researchers and scholars: To have a robust core of investigators, we must enhance the participation of individuals of diverse backgrounds who engage in research and scholarship on the IUPUI campus. This includes the undergraduate students, graduate students, postdoctoral researchers, faculty, and support staff. We also need to reach out to engage K-12 students to have them understand the excitement and rewards of being involved in research and scholarship.

Engage in research that is mindful of the rich patterning that is characteristic of the human condition: There are already a number of exemplary research programs on the IUPUI campus that directly address minority health care issues and cultural competence. These range from health sciences to law, social work, philanthropy, and public policy and environmental affairs. It is important that we continue to build on these activities of engagement and that we find additional r ways to provide greater understanding and solutions that support our diverse community.

Expand space for research and scholarship - We will not be able to substantially increase the number of productive research investigators unless we are able to provide them with adequate space in which to conduct their research and scholarly activities. Vice President McRobbie has surveyed research needs for the University, and in a draft report, he has estimated the current unmet research-space needs of the IUPUI campus to be 374,635 of assignable sq. ft. However, assessing the specific sq. ft. needs for each school is a challenge. The School of Medicine has completed a space analysis in comparison with peer institutions that has served to define their space needs. A similar procedure now needs to be applied to all of the schools within IUPUI. Allocation of space within schools will need to remain a school-level decision since a single formula will not fit all schools well. Some schools may tie allocations to the level of external funding while others may assess the need for space based on scholarly productivity relevant to the investigator's discipline. It is important that schools regularly review assignments of space to ensure that one of our most limited resources is being used productively. It will be a special challenge to construct new space for those programs that are not able to generate external support through full overhead cost recovery.

Outcome measures: Implementation of the recommendations of the Task Force on Doubling Research should result in several measurable outcomes including the following:
- Increase in the proportion of the faculty who engage in research
- Increase in the level of funding per investigator
- Increase in the overall level of research support
- Increase in the number of researchers engaged in interdisciplinary or multidisciplinary research programs
- Increase in the number of interdisciplinary or multidisciplinary research programs
- Increase in the representation of people of diverse backgrounds who are engaged in research and scholarship

Appendix 1.

New "Initiative"	Potential Disciplinary Areas of Research and Scholarly Expertise	Sample of Potential Collaborating Centers/Institutes
Basic Life Science Research Initiative	Medical Science, Nursing, Allied Health Science, Medical Technology, Public Health, Health Services Research	• IU Center on Aging • Bowen Research Center • Indiana University Center for Bioethics • Bio-Mechanics Research Laboratory • Center for Regenerative Biology and Medicine
Applied Life And Health Science Research Initiative	Medical Science, Nursing, Allied Health Science, Medical Technology, Public Health, Health Services Research, Medical Humanities	• IU Center on Aging • Bowen Research Center • Indiana University Center for Bioethics
Informatics and New Technology Initiative	Informatics, Engineering, Physical Sciences	• School of Informatics • Bio-Mechanics Research Laboratory • Institute for Forensic Imaging
Physical and Environmental Science Initiative	Physical and Natural Sciences, SPEA, Social Science, Business	• Center for Earth and Environmental Science • Facility for Computational Molecular Science
Initiative for Applied Research on Social Issues	Social Services, Public Policy Research, Applied Social Science, Business, SPEA	• Polis Center • Center on Philanthropy • IU Public Opinion Laboratory

		• Indiana University Center for Bioethics
Community Arts and Humanities Initiative	Humanities, Music, Theater, Language and Linguistics	• Institute for American Thought • Theater/Music Departments and Programs • Center for the Study of Religion and American Culture • Center for Bioethics
Scholarship of Teaching and Learning Initiative	Research on Higher Education, Teaching Strategies, Service Learning	• Center for Economic Education • Center for Urban and Multicultural Education • Center for Service Learning • Indiana Center for Intercultural Communication

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