# Research Domain Subcommittee Report to University Committee on Academic Planning and Priorities (UCAPP)
March 15, 2007

INTRODUCTION

The Research Domain Subcommittee of UCAPP has met on a two-weekly (sometimes weekly) schedule since October 2006 to discuss the charge given to it by Provost Subbaswamy. The members of the committee are:

W. Balke (Medicine)
N. Cox (Agriculture)
C. Martin (Psychiatry)
J. Popkin (History)
G. Rowles (Gerontology)
D. St. Clair (Toxicology)
M. Truszczynski (Computer Science)
C. Staben (Acting Head, Office of VP Research, Admin. Co-Chair)
K. MacAdam (Physics & Astronomy, Faculty Co-Chair)

We resolved to make a concise report that gives plain advice on major issues in research in pursuit of the goals of the UK Top 20 Business Plan. We did not think it was our charge to provide data, detailed analysis or solutions. The report is organized into seven numbered sections, each followed by one or more bulleted recommendations.

1. RESEARCH THEMES, TRENDS AND OPPORTUNITIES

The Committee explored major trends and enduring themes of research, recognized by national and governmental bodies, in order to bring an improved direction to UK's institutional outlook and opportunities.

We believe that the specific research priorities of scholars and scientists in the University are properly set by the individual and collective actions of faculty and research staff. Principal investigators and their colleagues are the ones who know where "pay dirt" is likely to be found in their own areas of study. Departments and research units, by hiring outstanding nationally competitive individuals, continually refresh both the vision and the energy of the University's research and scholarly environment.

We feel that top-level endorsement of a sharply specific list of UK research priorities tends to stifle innovation, reduce flexibility, create unrealistic expectations, and encourage divisiveness. The University's research goals and priorities should be expressed in an inclusive manner that encourages individuals and units to share them in a spirit of combined purpose.

While specific directives are likely to subdue creativity and productivity, the University *does* need strategic directions for research and *should* commit resources accordingly. At

the same time, there needs to be clear articulation why particular directions are chosen. Leadership is needed to bridge the gap between individual creativity and major trends and needs. An ongoing process exhibiting inclusiveness and faculty input should be established by which strategic directions are determined and frequently reexamined.

The doubling of the NIH budget begun in the late 1990s and the American Competitiveness Initiative (ACI) launched in 2006 both represent long-term US commitments to expansion of federally funded activities in medical, biological and health sciences and in physical and mathematical sciences, engineering, technology and education in the national interest. Research and scholarship in the arts and humanities also contribute to the Nation and the Commonwealth and form essential parts of the University's competitive position, even though they normally represent far less in grant dollars. The University can be in a strong position to share---indeed, to lead---in nationally prominent research activities and advances in all fields, provided that it continues to upgrade its physical and human infrastructure.

RECOMMENDATIONS:

- UK should frame its goals and priorities for research and scholarship to reflect overarching societal and technological issues and encourage broad participation from disparate fields.

- The University should create an inclusive process with open faculty input for continuing discussion and reevaluation of its research strategies and investments.

## 2. CAPITAL PRIORITIES AND PLANNING

The Committee discussed issues of capital priorities and planning. Many Committee members were unaware of the planning process and felt that this lack of knowledge was widespread. The Committee recommends that the University administration make the planning process transparent and that all major decisions concerning capital priorities and planning for research be announced together with clear rationales and be subject to campus-wide discussion. In particular, there should be a close correlation between capital priorities and budget allocations on the one hand, and long-term research directions and goals on the other. The transparency and inclusiveness of the process are necessary to ensure that every segment of the University is well informed and is included in active dialog.

The Committee recognizes the growing role of interdisciplinary research and generally endorses multipurpose research buildings as an important research-enabling factor. The Committee feels that new research buildings should mirror and assist in emerging interdisciplinarity and should support the University's long-term research plans.

The Committee advises, however, that the following aspects be carefully considered:

(a) The effect of interdisciplinary research facilities on the cohesiveness of academic departments, on traditional collegial ties, and on the vertical integration of research with instruction;

(b) The effects of interdisciplinary research facilities on the merit, tenure, and promotion process for faculty members located in such facilities, away from their home units; and

(c) The process and criteria used to establish new interdisciplinary research buildings, to administer them, to review the effects they have on research, and to determine on an ongoing basis how to reallocate space within such buildings

The Committee also believes that college and departmental facilities will continue to be a major component in an overall research infrastructure of the University and recommends that the space needs of colleges and departments as expressed through the appropriate deans receive full consideration when determining University capital priorities.

RECOMMENDATIONS:

- The University administration should develop and adopt a transparent research capital planning process and regularly communicate long-term research directions, goals and strategies to meet them.

- All major decisions concerning the infrastructure and budget in support of research should be subject to campus-wide discussion and be correlated closely with the University's long-term research directions.

- Interdisciplinary research buildings should be acknowledged as an important research-enabling factor for the University, provided that aspects of vertical integration, departmental cohesiveness, and faculty mentoring are carefully monitored.


3. ENABLING STRATEGIES

The Committee explored a variety of strategies for moving the University forward in research, including recruiting "star" faculty, strengthening retention strategies, investing heavily in quality graduate programs, and developing research support infrastructure.

With respect to the recruitment of star faculty, several approaches were suggested: 1) Focused hiring of a nucleus of star researchers in a limited number of target areas to build research prominence, using attractive space, salary, and startup packages. For example, in the sciences (including the social and behavioral sciences) one senior "nucleus" hire with 3-5 junior hires---a "cell" approach. Fit in such groups is critical, as is aggressive mentoring. In the humanities, however, a number of independent senior hires may be more effective.

2) Focus on identifying early-mid-career faculty at the senior assistant or junior associate professor level or staff researchers who are deemed to be "rising stars." The strategy here would be to offer extremely attractive support packages to these targeted individuals. Faculty members or prominent research staff (faculty-level) recruited in this manner are likely to become eminent within a few years and contribute to the achievement of Top 20 status well before 2020. Retention strategies for recruited faculty and staff at all levels deserve innovative thinking, and visible commitments by the University to honor successful faculty could be highly effective.

A critical factor in recruitment, regardless of the level of appointment, is the need to provide highly competitive start-up and support packages. In order to gain a competitive advantage, the University needs to place increased emphasis on accommodating dual-career relationships. Creation of a University-wide infrastructure to assist candidates with finding appropriate positions for partners (either within or outside the University) and support in dealing with family-related needs is necessary.

The Committee agreed that investing heavily in quality graduate programs will greatly enhance the research enterprise. The provision of research assistantships and fellowships providing levels of support that are competitive with benchmark research institutions is a critical need. Three mechanisms for such support should be considered: research fellowships for students in the basic and social and behavioral sciences, a separate category of research-oriented fellowships for students in clinical domains, and a special fellowship program for individual students in the humanities and related areas. A mechanism (possibly a University-wide committee) for the allocation of such assistantships and fellowships should be developed. Criteria for their allocation might include priority research areas (including those where "star" faculty have been recruited), promising areas for research where graduate fellowships are not now common, and association with individual faculty members whose research shows great promise but who are not necessarily identified with a research priority area.

Integral to the attraction, retention and nurturing of star faculty is provision of appropriate infrastructure to support their endeavors. Such infrastructure, essential to the success of any interdisciplinary research endeavor, is of two kinds: physical infrastructure including appropriate space and equipment (see Items 2 and 6); and human infrastructure including research technician and professional staff support (see Item 7).

RECOMMENDATIONS:

- In addition to hiring the best faculty at the entry level, a comprehensive faculty recruitment strategy should involve hiring senior "stars" and early-mid-career "rising star" faculty who are provided with highly competitive start-up packages. This should be augmented with a University-wide infrastructure to facilitate and coordinate partner hires and family-related needs.

- Improve retention strategies for faculty and research staff at all levels, including a program to recognize and honor successful faculty.

- Increase University funded research fellowship support to levels competitive with benchmark institutions, and establish separate programs of research fellowship or assistantship support for: (1) the basic and social and behavioral sciences, (2) clinical sciences and (3) the humanities.

- Develop and implement formal communication procedures for improving the liaison between components of the University involved in faculty recruitment and those involved in the development of physical and human infrastructure.

## 4. RESEARCH IN THE HUMANITIES, ARTS, AND RELATED FIELDS

Outstanding research by faculty in the humanities, arts, culturally oriented social sciences and related fields makes an essential contribution to the university's standing. Great universities have always been recognized by their strength in these areas as well as in the natural sciences and professional fields. To build its reputation in this area, the University needs to recruit and retain outstanding faculty, both at the entry level and at more senior ranks. Research contributions in these fields cannot be measured by the same criteria as the natural sciences, such as federal funding received. Achieving consensus on criteria for ranking departments in these fields will require extensive consultation with the departments and faculty concerned. Improved support to attract outstanding graduate students to UK is also essential to progress in these areas.

To stimulate humanities research, the Committee endorses the specific initiative of a center or institute for humanities research. Such centers, which are found at most large universities, normally offer a number of fellowships to campus faculty, allowing them a semester or year to pursue individual projects and thereby enhancing research productivity. Many centers also offer competitive fellowships for faculty from other institutions and for outstanding graduate students. In addition, humanities centers typically sponsor conferences, lecture series, and exhibitions, all of which are opportunities for raising the university's profile as a center for research. UK's success in raising money for endowed professorships in these areas shows that a humanities research initiative would offer many possibilities for fundraising. In addition to supporting such a center's general mission, donors might endow fellowships or other specific programs. The proposed center would complement the University's highly successful Gaines Center for the Humanities, whose mission is to promote undergraduate education.

RECOMMENDATION:

- The University should establish, with strong central recurring support, a center or institute for research in the humanities, arts and culturally oriented social sciences including a program of faculty and graduate fellowship support.

5. RESEARCH MEASUREMENT

The UK Top-20 Business Plan included three key indicators (among others) that relate primarily to research: Total grant dollars, total federal grant dollars and faculty citations. The Committee endorses use of the first two as quantitative measures of research activity at UK by which our progress can be gauged and relative standing with other universities determined. It should be clearly understood that not all forms of scholarship and research can be measured in this way and that those which attract little external funding---for instance, the arts and humanities---are of undeniable importance for the University's reputational standing and for its intellectual contributions to the Commonwealth and the research community at large.

Citation statistics have become a widely used, yet controversial indicator of the impact and quality of research. We note that wide variations exist in the citation practices among those disciplines and sub-disciplines, mainly in the sciences, where papers-citing-other-papers is the accepted currency of the research record. Citation comparisons between fields, between comparable departments, between individual scholars, and between years have little transparent meaning: The results depend entirely on methodology, and only information scientists are knowledgeable of the methodologies used. Therefore, the committee recommends considerable caution in using this Top 20 measure in overall assessment.  Additional measures, such as PhD degree production and faculty awards or recognitions, are also useful in assessing research.

The University should actively seek other appropriate quantitative scales in cases where citation statistics are inappropriate through dialog and consensus with UK scholars in those fields. This will serve both to give proper recognition to the full spectrum of scholarship that makes a great university and to challenge scholars in those areas to acknowledge their role in the University's quest for a comprehensive Top 20 ranking.

RECOMMENDATIONS:

- Find discipline-specific indicators, in addition to those reflecting purely research funding, to measure research and scholarly activity in different fields.

- Use citation statistics as an indicator of research output and impact only in those fields, explicitly specified, where meaningful comparisons can be attempted. Devise other appropriate indicators, in consultation with units such as arts and humanities, where citations cannot be used.


6. CORE FACILITIES

The Committee was in general agreement that core facilities are important infrastructural elements for research and an essential part of our research strategy. Varied core facilities include: libraries, laboratory animal facilities, bio-containment facilities, supercomputer

resources, statistics and data analysis facilities, the UK Clinical Research Organization, and major common-use instrument facilities. (Information on many of these resources can be found on the Research website.) Core facilities are maintained by several different groups on campus. Support, access and usage policies differ. Some facilities are run by professional staff, while others do not have dedicated professional or technical support. Charge structures are in place for some facilities but are absent---or even inappropriate--- for others, such as libraries. Some services are best provided by vendors, not by campus providers. The University should evaluate each service on a periodic basis to determine how best to meet campus needs. Such evaluations should include needs, quality of service, and cost of service relative to benchmarks or alternative providers. The mechanisms for initiating new core facilities or for evaluating existing ones are not clear in many cases.

Many core facilities are overseen by the Office of the VP for Research and are supported by the combination of service fees and indirect-cost subsidy. Subsidies vary from one facility to another. In general, the University should provide core services that fall into two general categories: unique services or instruments that provide an essential advantage to UK researchers but are beyond the means of a single research group to support; or services that are routine and essential on a Top 20 research campus.

Key elements that make a core facility work well include an effective director, professional-grade staff, visibility and recognition of the facility, need for and high use of the services offered, and modern well-maintained equipment. The responsibility of a core-facility's director should include not only high quality service but continued effort to develop state-of-the-art services that meet evolving needs. In some cases the University expects faculty members to take a large role in running core facilities. In general, such roles are more appropriate for staff than for faculty.

RECOMMENDATIONS:

- UK should establish criteria for initiating, maintaining, and evaluating core facilities appropriate for each major discipline in a fair and transparent manner.

- Indirect cost subsidies should continue to be used to enhance the competitiveness of UK research infrastructure and ensure continued functioning of such structures.

- When possible, UK should employ high-level, non-faculty professional staff to direct core facilities to ensure high quality service and continued development of state-of-the-art services that meet evolving needs.

7. RESEARCH ADMINISTRATION

The Committee considers research administration of utmost importance to catalyze and support the increased activity necessary for the Top 20 goal of nearly tripling research expenditures by 2020. This goal requires an aggressive new paradigm for support of research operations. The Committee has reviewed the structure of central administrative

support functions and the general budget of the office of the VP for Research. Three areas of emphasis judged to be critical: staff support, research resources, and streamlined procedures, are reviewed below.

To enable increased research activity, staff support should be enhanced dramatically. With additional external grants and contracts, the University will experience additional constraints in the following areas: pre-award approval, contract negotiation, regulatory compliance, re-budgeting, and cost accounting. These increases necessitate increased staff resources in multiple units, both in Research and in research support within colleges. The Committee recommends against relying on increased Indirect Costs (IDC) to meet these needs, since the additional support is needed "up-front."

Centrally managed resources should be targeted to enhance the research mission. The University should distribute IDC and other available research funds in a transparent manner that stimulates maximum productivity by research units. It is recognized that many funding sources, such as special grants, foundations, non-profits and state agency funds, do not pay IDC. The University should clearly and unequivocally support research efforts that may not generate maximal IDC yet do contribute to excellence in terms of publications, citations, graduate student and postdoctoral education, and other measures supportive of Top 20 status. Policies for IDC, however, should be developed to provide a strong incentive for recovery of IDC on grants and contracts. The current allocation of funds by the VP for Research's Office was deemed to be appropriately distributed in general. The funds distributed in blocks, such as that allocated to the Graduate School, should be subject to transparent, periodic review.

Administrative procedures should be reviewed for maximum service to the research operation. Although the main office of oversight for research is the Office of the VP for Research, performance of research contracts involves oversight by potentially three vice presidential administrations: Research, Finance, and the newly established office of Economic Development and Commercialization.

RECOMMENDATIONS:

- The University should provide high quality, talented staff to support the planned growth in expenditures, coupled with a commitment for aggressive enhancement where needed. Funding for these positions from "hard" dollars should be a priority, and Human Resource policies should be redesigned to enhance and reward the kind of high-performance staff members needed to support the research

- The University should provide on a college-by-college basis the optimal support needed to enhance the research mission; this process should be coordinated by the Office of the VP for Research but involve sources of investment in addition to IDC. Incentives for IDC, such as returning higher proportion to researchers and their units, should be considered.

- All University units that support grants and contracts must develop service-oriented, integrative mechanisms to support the research enterprise. There should be a periodic evaluation of these services using appropriately developed metrics.