OVERCOMING BARRIERS TO MULTIDISCIPLINARY RESEARCH

The Task Force to Identify Barriers to Multidisciplinary Research recommends the following actions to overcome the barriers identified and detailed in the following report:

\* **Personnel process:** Reviewers at all levels should emphasize the value of collaborative research, explain how individual efforts relate to the whole and outline the value to UCI.

\* **Resources:** Central administration needs to make a modest allocation of financial resources (roughly $1 million per annum) to promote development of multidisciplinary research and to promote discussions and activities across disciplines.

\* **Support:** Central administration should assign a staff person to identify, facilitate and guide the development and preparation of multidisciplinary funding proposals.

\* **Cost Sharing:** The Vice Chancellor for Research should facilitate discussions among participating units concerning cost-sharing responsibility.

\* **Credit:** Central administration should develop a system to assure assignment of appropriate credit to each PI on a multi-PI proposal.

\* **Facilitation:** Deans should take a proactive role in support of PI (s) in their role as project coordinators in order to facilitate collaboration among researchers, as well as participate in dealing with conflict resolution among PIs.

\* **Policy:** Central administration should develop policy and provide workshops related to the management of multi-department awards and the assignment of responsibility among participating PIs.

\* **Aftermath:** Deans, Chairs and Directors should plan to assist in re-employment of staff at the anticipated termination of large multidisciplinary grants.

A Task Force assembled by Vice Chancellor Wan was unanimous in the view that inter/multi/transdisciplinary research is a valuable component of the University’s research activities, benefitting the University, faculty and students. In fact, many fields today require such a structure in order to effectively pursue research problems and to be competitive. In order to facilitate and increase these activities at UCI the Task Force developed the following document detailing areas that represent barriers to multidisciplinary research. Some suggestions for how to eliminate barriers also are presented. In addition, the group discussed the need for improvements in the development of and support for multidisciplinary educational programs. In the document that follows, the terms multidisciplinary, interdisciplinary and multi-investigator are used interchangeably and include activities sometimes referred to as transdisciplinary. These activities include program projects and centers with the understanding that larger projects may encounter difficulties that are less severe or nonexistent for smaller projects.

Barriers are grouped sequentially, involving those associated with coalescing a group of faculty to embark on a collaborative project; preparation of proposals; grants administration and other research-related issues; and post-proposal concerns.

I. GENERAL ISSUES RELATED TO MULTIDISCIPLINARY RESEARCH

A. **The personnel process.** Certain disciplines (e.g. particle physics) have a history of multi-investigator research. However, this is not universally true. The personnel process at recruitment and advancement, and at all levels, needs to be sensitive to the unique issues presented by participation in multidisciplinary research. Chairs and deans should be made aware that these activities are a priority for the campus and that they benefit the campus in ways that are distinct from single-investigator research. This appreciation for the benefits of participating in this kind of research should be clearly transmitted to faculty, who often are unwilling to become involved because of concerns with respect to advancing their careers. This is particularly true for junior faculty. When chairs prepare dossiers and deans comment on them, it should be clear what an individual faculty member’s specific contributions are in light of his or her acknowledged expertise. Dossiers for faculty involved in multidisciplinary research should be "flagged" so that they are monitored throughout the review process.

Reviewers at all levels historically have emphasized independent research. Thus, support from a multi-investigator grant and authorship in a multi-investigator publication are often viewed as inferior to a single PI-funded grant and publication. The Administration should present the importance and "value-added" of collaborative research to CAP and monitor specific cases (flagged in the department and school review) to insure that faculty contributions are fully acknowledged.

B. **Campus support for new proposals.** There is a need to identify sources of internal campus funding for collaborative research. The incentives introduced this year by EVC Lillyman to support the preparation of center and multi-investigator projects are a step in the right direction and should be continued, broadly publicized and of sufficient magnitude to encourage faculty to participate. We suggest an investment of $1M each year for an RFP to support activities that lead to a proposal for an extramurally-funded major research center (ERC, STC, etc.). No proposal in response to the RFP should be funded more than one time, so that the full $1M is available each year to support new ideas. Such funding could be used to support staff involved in proposal preparation, to sponsor seminars and group meetings and other related activities. Evaluation of these proposals and recommendations for funding should be conducted through the Office of Research and Graduate Studies since it possesses the infrastructure and long-standing responsibility to adjudicate proposals for various types of research-related activities. It would be inefficient and unnecessary to set up a different mechanism to handle this RFP. In addition, the IRU program, which will be reviewed by a Task Force charged by the Council on Research, Computing and Library Resources, could be revised to preferentially seed **NEW** collaborations.

II. PRE-RFP AND THE RFP STAGE

A. **Stimulating interdisciplinary discussions.** The campus design results in isolation and compartmentalization so that a lack of networking may exclude potential collaborators. The challenge is to facilitate interactions broadly across the campus so that, when opportunities arise, faculty are prepared to respond. Because faculty often are not aware of the interests and expertise of their colleagues in different departments and disciplines, a series of activities (e.g., half-day retreats, breakfast meetings, etc) should be organized to facilitate discussions across disciplinary and departmental lines. The goal of these events would be to make faculty aware of other persons on campus who have similar or complementary interests and expertise, and who might be potential partners in multidisciplinary projects. One model for these sessions could involve brief presentations of research highlights from all or selected participants. These events might appropriately be sponsored by the Senate Council on Research, Computing and Library Resources with modest financial support from RGS for space, equipment rental, light refreshments, etc. The RGS staff suggested below in IIB could serve as a resource to assist in identifying prospective participants.

B. **Overcoming faculty reluctance.** Faculty frequently are unfamiliar with agency guidelines for proposals designed to establish and support multidisciplinary projects. Moreover, many faculty are reluctant to become involved in the complexities of multi-investigator projects and gravitate toward projects over which they exercise full control of the design and execution. To help overcome these existing impediments so that new multidisciplinary projects are developed, RGS

should identify a dedicated staff person who is knowledgeable about, and responsible for, guiding the development of such proposals. This person should not only be informed about agency requirements but also skilled in mediating discussions that must occur among potential faculty participants. This individual should be named as the resource contact (with phone number and email address) in all on-campus announcements of multidisciplinary funding opportunities. In addition, faculty who have been or are involved in the review of various types of multi-investigator awards should be identified as potential resources based on their personal experience.

C. **Proposal assembly.** Assembling multi-investigator proposals is very time-consuming. RGS (specifically Randy Black) has been very helpful in preparing these proposals, but preparation of these types of proposals often puts an unusual burden on faculty who become involved in some administrative aspects of proposal preparation. In addition, as more interest and activity occur in this area, increased central support will be needed for proposal preparation. This should relieve faculty and academic units from much of the burden of proposal preparation and, perhaps, increase support for multi-unit proposals by the faculty and among the units. Release time from departmental responsibilities may encourage faculty to become involved in multi-investigator grants. Funding for release time may be obtained through a request in response to the RFP for assistance in preparing large center proposals described in IB (above). Such a mechanism would eliminate the pressure on academic deans who have to meet the instructional responsibilities of their units.

D. **Negotiations with deans.** Cost-sharing negotiations, including space and staff commitments, between faculty and deans are sometimes frustrating. The VCR or designate could assist in these negotiations with the relevant deans. The VCR is the Institutional Official (IO) who is accountable to federal, state and private sponsors that fund our research projects. He/she must exercise some judgment when to intervene in an impasse between the PI and the administering unit of the contract/grant in order to broker solutions to cost-sharing, space and support problems.

E. **Allocation of credit.** The campus policy of credit and indirect cost return allocated relative to expenditures is "after the fact" and essentially invisible to the faculty and deans. A change in the designation of a single PI on administrative approval (AA) forms and its downstream effects to one of **shared** credit would alleviate this problem. Special attention should be directed towards assignment of credit when faculty are members of both a department and another adminstrative unit(s) (e.g. IRU, ORU, Center). The Office of Research and Graduate Studies is currently revising its AA Form to allow for designating the percentage of effort for each academic unit that has been agreed to in advance by project participants. The distribution can be revised subsequently to reflect the actual award. At the same time, sponsors will require that a single PI be held accountable for the award. Hence, it should be understood that the PI of the grant/contract must have certain authority commensurate with that accountability.

III. GRANTS ADMINISTRATION AND RESEARCH STAGE

A. **Role of the PI.** Center grants are designed to support coordinated activities, with the PI having significant coordination authority. Conflicts may occur between the PI and collaborators who continue to function as individuals. The lead PI should be supported by the relevant deans in his/her role as coordinator. This requires education with respect to the expectations and responsibilities of participants who agree to join a center, and is best established by all involved, achieving a level of trust with each other. RGS or the EVC might play the role of a neutral referee in detailing agreements.

B. **Fiscal accountability.** Multi-investigator awards including more than one academic unit create special challenges concerning fiscal accountability, compliance with Cost Accounting Standards, personnel management and other UCI administrative matters. An example of a concern among PIs of these awards is the responsibility for budgetary overruns/disallowances. Solutions include: (1) written agreements among participating academic units about delegated responsibilities, reporting requirements and schedules for submission of data and final reports; (2) periodic workshops on contract/grant management for faculty and administrative staff; and (3) campus policy statements providing context and guidelines for management of multi-investigator and multi-department projects.

C. **Lack of knowledge of agency expectations**. This can be addressed by the RGS staff person recommended above, both at the time of proposal preparation and again, when the grant is funded.

IV. POST-RESEARCH STAGE

A. **The personnel process.** Comments in IA (above) apply here as well (the so-called "penalty of co-authorship"). As noted, this is best addressed by the chair’s letter, in consultation with the faculty member involved and experts in the field.

B. **Staff concerns.** There are issues related to staff security of employment that emerge when a grant ends and there is no continuing support for those hired to work on the project. Morale can be low when staff are uncertain about their futures. Departments and deans should be apprised of the need to identify new positions for such staff or to assist them in their efforts to identify new positions well in advance of the termination of the grant so that they can be proactive if positions appear for which the impacted staff are qualified.

END NOTES

The Task Force requests that this report be distributed widely to faculty and suggests a website posting with solicitation for input and questions with a closing date during the Fall quarter, contingent upon the date of release of the report.

In addition, we request that the administration respond to this report at the end of the coming academic year, and annually in subsequent years, providing an update on progress in the areas identified as well as the level of multidisciplinary research and its support on the campus.

Finally, throughout our discussions the issue of multidisciplinary education arose numerous times. We recognize that there are unique problems associated with training students across disciplines administratively, financially and, most importantly, in course and examination requirements for these students. The Task Force obtained the recently submitted Burroughs Wellcome Fund Bio-Interfaces Program proposal, which represents an excellent model for the development of multidisciplinary graduate programs. We suggest the formation of a joint Senate/Administration task force to investigate this issue further.

 Members of the Task Force

Barbara A. Hamkalo, Chair

Nicolaos G. Alexopoulos

# David A. Brant

Susan V. Bryant

C. Ronald Huff

Frances M. Leslie

Frank L. Meyskens

William H. Parker

Richard Taylor

Frederic Y.M. Wan