

University of Wisconsin-Madison

Report of the Cluster/Interdisciplinary Advisory Committee to Evaluate the Cluster Hiring Initiative July 2008

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Executive Summary

Interdisciplinary teaching, research and outreach at the University of Wisconsin-Madison have historically enjoyed broad support as evidenced by some 290 interdisciplinary-focused programs, departments, centers and institutes across campus. In part, this is because new areas of knowledge, new forms of pedagogy, and increasingly complex and applied research do not always fall neatly into the departmental structures of higher education institutions. Further, the rapidly increasing pace and growth of knowledge and technological know-how in recent decades has accelerated the need for interdisciplinary efforts. However, even within a favorable environment, interdisciplinary efforts often challenge our institutional culture and structure.

To foster the growth of new areas of knowledge and deal with some of the institutional barriers to interdisciplinarity (i.e., complex curricular demands, tradition of departmental hiring and promotion, faculty governance), the Cluster Hiring Initiative (CHI) was conceived and implemented in the late 1990's. The CHI was intended to help keep UW-Madison at the forefront of research and knowledge and to advance the state's economy. To do so, this unique initiative created nearly 150 new faculty lines to advance knowledge at interdisciplinary crossroads by providing an alternative to the usual departmentally-based hiring practices and norms. Funding for the CHI comes from a partnership with the state of Wisconsin, the Wisconsin Alumni Research Foundation, and the University of Wisconsin Foundation each providing \$5 million annually.

Since its inception, the CHI has provided new insight into the conditions under which collaboration across disciplines and across institutional structures can flourish. As each new phase of cluster hiring passed and as existing clusters matured, it became clear that clusters put a high priority on team work and collaboration through regular meetings, conference/event sponsorship, collaborative research and outreach activities, and team teaching. Both formal and informal face-to-face collaboration is essential to the productivity and functioning of clusters. This is particularly true for clusters that formed around an idea but did not have a center, institute or departmental structure that similarly helps to foster interaction among groups of faculty centered on a common interest. Further, renditions of this innovative initiative are now being increasingly replicated at major universities across the country.

This is the second self-evaluation of the CHI: The first, conducted by the *Provost's Ad Hoc Advisory Committee to Evaluate the Cluster Hiring Initiative* in 2003, concluded that although it was too early to determine the exact extent to which the CHI was meeting its objectives, the clusters were spawning new research, courses and outreach activities. The report concluded that the CHI should continue and it made recommendations to improve the CHI, most of which have been implemented. The first report also called for a follow-up evaluation within five years. This second evaluation involves qualitative and quantitative research generated over two years and was overseen by the Vice Provost for Faculty and Staff who serves as the campus-wide coordinator of the CHI.

After careful analysis and deliberation, we conclude that the CHI is a success and is meeting its objectives. In only a few years, the CHI has created or strengthened 49 areas of academic

interdisciplinary inquiry that match the teaching, research and outreach productivity of departmentally-based faculty. Since many of the insights gained through evaluating the clusters apply to interdisciplinarity in general, the following recommendations are made to foster the environment for cluster and other interdisciplinary efforts across the campus.

1) Continue to support and grow cluster and interdisciplinary efforts across campus

- Maintain full funding and support of the current number of cluster faculty.
- Expand the cluster initiative through a centrally-administered, faculty-driven program that annually allocates 10% of all faculty lines to “institutional innovations,” such as the CHI (current CHI lines equal 6.6%).
- Establish an “Interdisciplinary Common Fund” to support new research, teaching and outreach, and encourage schools/colleges to work cooperatively to reallocate or find new resources to fund additional clusters around new areas of interdisciplinary inquiry (i.e., clinical translational research, biofuels initiative).

2) Create new supportive mechanisms and funding streams to foster interdisciplinarity

- Maintain the Cluster/Interdisciplinary Advisory Committee to foster cross-campus interdisciplinary efforts.
- Appoint a Vice Provost of Interdisciplinary and Institutional Innovation to coordinate the ongoing evolution of the CHI and all interdisciplinary programs and efforts aimed at institutional change.
- Work with the UW Foundation to develop strategies for raising funds and endowments for interdisciplinary efforts that are not anchored in traditional schools/colleges/departments.
- Establish an “Interdisciplinary Infrastructure Fund” to provide administrative and program support for efforts not connected to traditional institutional infrastructure. Meanwhile, continue to allocate \$200,000 annually in cluster enhancement grants until those funds would negatively impact the number of faculty hired.
- Maintain a campus cluster Web site to share information and best practices.

3) Develop methods to evaluate cluster and interdisciplinary innovations and success

- Work with divisional committees to develop tenure guidelines and criteria for the documentation and evaluation of interdisciplinary scholarship, and to develop procedures and guidelines for cross-divisional representation on tenure committees for interdisciplinary-focused faculty.
- Establish data collection and accounting mechanisms to measure and document a range of cluster/interdisciplinary efforts and productivity (i.e., research grants, patents generated, new courses, certificates and degrees developed, papers published, etc.).
- Develop a process and criteria for the Vice Provost working with the Cluster/Interdisciplinary Advisory Committee and cluster coordinators to comprehensively evaluate each cluster every five years.
- Promote interdisciplinary efforts campus-wide through supporting ongoing conferences on interdisciplinary issues.
- Prioritize ethnic and gender diversity hiring in cluster faculty replacement positions.

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Interdisciplinarity at UW-Madison

Interdisciplinary teaching and research at the University of Wisconsin-Madison have historically enjoyed broader support than at other major research universities around the country. Our history of fostering innovative and interdisciplinary efforts includes the Experimental College (1927); the Integrated Liberal Studies Program (1947); Afro-American Studies, the Institute for Environmental Studies and Women's Studies Program (1970's); Arts Institute, Center for Humanities and Biotechnology Center (1980's); the Cluster Hiring Initiative (1998); and the Worldwide Universities Network (2001).

Today's new interdisciplinary and translational mega-centers such as the Microbial Sciences Building (2007), the School of Medicine and Public Health's Interdisciplinary Research Complex (nearing completion), the public/private partnership Wisconsin Institutes of Discovery/Morgridge Institute for Research (projected 2011), as well as interdisciplinary mega-grants such as the \$150 million DOE Great Lakes Bioenergy Research Center award (2007) and the \$50 million Translational Medicine award (2007) will continue to position UW-Madison at the interdisciplinary forefront. These new facilities and grants are designed to bring publicly-financed research in closer proximity to market forces and private capital, a practice considered standard in regional economic development efforts. In turn, these efforts are changing the dynamics of collaboration between academics and business leaders as well as the function of intellectual property and patents.

State of Wisconsin investments in new interdisciplinary initiatives on campus, and philanthropic gifts through the University of Wisconsin Foundation (UWF) and revenue from the Wisconsin Alumni Research Foundation (WARF) patents and licenses have been instrumental in funding both new buildings and facilities, and promising new areas of interdisciplinary research. Furthermore, major grant-making agencies, such as the National Institutes of Health and the National Science Foundation, are increasingly focused on supporting interdisciplinary research as well as changing their own policies and procedures to better evaluate and legitimize interdisciplinary research and the changing nature of collaboration.

All of this has contributed to UW-Madison becoming a metropolis of interdisciplinary activity. There are currently 289 self-identified interdisciplinary departments, programs, centers and clusters across campus. And the increasing pace, complexity and growth of knowledge continues to contribute to the need for interdisciplinary efforts. Some areas of great potential for developing new knowledge and research span a number of departments as well as schools and colleges. Often new areas of knowledge, new forms of pedagogy, and increasingly complex and applied research do not fall neatly into the departmental structures of higher education institutions.

These precedents have created a campus culture responsive in many ways to the external factors that influence collaboration across traditional boundaries. For example, the quickening pace of change and convergence in the disciplines, especially the biological and physical sciences, is making interdisciplinary research increasingly the norm rather than the exception. Many candidates for faculty positions now have interdisciplinary backgrounds and interests. Dual competencies and degrees are becoming more common.

On the whole, the campus community constantly reports that the interdisciplinary culture and tradition at UW-Madison creates not only an environment of excitement, but also the foundation for our success in securing grants and gifts and in our excellent faculty publishing record. However, many challenges for interdisciplinarity remain. There can be tension between the scholarship, traditions and canons of established and specialized disciplines, and the scholarship and practices that take place outside of the historically accepted disciplinary boundaries, methodologies, or theoretical constructs. This tension is an important factor in the way the cultures of various disciplines can undervalue interdisciplinary research. Moreover, even well-intentioned faculty mentors who support interdisciplinary initiatives report they often continue to advise junior faculty to produce research for tenure consideration that conforms to the discipline and the historical ways in which scholars earn distinction in their field. In addition, efforts by scholars to receive legitimacy for new forms of knowledge or practice can be frustrated by the inertia of the academic publishing market and obfuscated by institutional systems for bestowing legitimacy to cross-disciplinary efforts (i.e., credit for proposals with multiple principal investigators, team taught courses, courses taught outside of department). As a result, interdisciplinary practice often requires increased time and effort, produces lower rewards per unit of effort, and confronts serious institutional and cultural constraints.

The structures that mediate interdisciplinarity on campus and the discourses that enable and constrain it are the product of the faculty, administration and governance structures of the institution. As such, the extent to which interdisciplinarity thrives on campus reflects the efforts and commitment of faculty and administrators to overcome the challenges inherent to institutional change. It is within this institutional interdisciplinary context that this report examines the contributions of the Cluster Hiring Initiative (CHI) to the UW-Madison and identifies the challenges clusters and cluster faculty face in conducting new and innovative interdisciplinary research, teaching and outreach.

Cluster Hiring Initiative Background

The CHI was conceived and implemented in the late 1990's to help keep UW-Madison at the forefront of research and knowledge, to advance the state's economy, and to deal with institutional barriers to interdisciplinarity (i.e., complex curricular demands, tradition of departmental hiring and promotion, faculty governance). This unique initiative created nearly 150 new faculty lines to advance knowledge at interdisciplinary crossroads by providing centralized funding (via the Provost's Office) for small groups or clusters of faculty focused around a common interdisciplinary issue, but not necessarily hired through the same department. The CHI also helped to reverse a decade-long trend of decreasing faculty lines at UW-Madison (Appendix A: Patterns in UW-Madison Faculty Hiring).

The seven major goals of the Cluster Hiring Initiative are to:

1. Enable the campus to devote a critical mass of faculty to an area of knowledge not addressed by existing departments;
2. Provide new research tracks and collaborative opportunities;
3. Address complex societal problems;
4. Advance the Wisconsin Idea by serving society's needs through interdisciplinary research, teaching and service;
5. Encourage and foster cooperation within an already strong faculty and staff;
6. Create new curricular offerings on the graduate and undergraduate levels; and
7. Assist in the fulfillment of other missions of the University, specifically increasing campus diversity.

Funding for the CHI comes from a partnership with the state of Wisconsin, the Wisconsin Research Foundation, and the University of Wisconsin Foundation, each providing \$5 million annually to fund the faculty lines. For a detailed background on the initiative and its policies and procedures, please see the Cluster Hiring Initiative Web site (<http://www.clusters.wisc.edu/>).

The clusters were selected via a campus-wide proposal process to strengthen and expand interdisciplinary research, teaching and outreach programs. Through five competitive rounds from 1998-2001, faculty submitted hundreds of proposals to fund faculty lines to pursue and develop new and promising areas of interdisciplinary and collaborative inquiry. These are permanent lines that remain with the hiring department as long as a cluster faculty member remains with the university. When a cluster faculty position becomes vacant, the faculty line does not remain with the department, or school/college. Rather, it reverts to the central funding pool and Provost' Office for possible replacement, or reallocation to new or existing clusters.

Since funding for the cluster faculty lines has been capped due to fiscal restraints, no new clusters were funded after Round Five of the competition. As of January 2008, the Provost's Office approved 142 centrally-funded faculty lines within 49 clusters. Additionally, schools/colleges were matching five faculty positions to strengthen some clusters. In a few clusters approved in the first round, faculty have been hired with partial cluster percentages resulting in a total of 147 faculty with full or partial centralized cluster funding (Appendix B: Clusters and Faculty Positions Rounds 1-5). Furthermore, most clusters have built networks of affiliated faculty, often coalescing more than a dozen additional faculty affiliates.

During Round 5, in addition to the six funded clusters listed in the table, the campus approved five additional clusters with three faculty members each (Biology and Management of Invasive Species; Family Policy and Law; International Gender Policy Studies; Transportation Management and Policy; and Urban Ecology and Ecosystem Dynamics), and approved three other faculty positions in funded clusters. Due to budget uncertainties at the time and ultimately state budget cuts, the five additional clusters and their positions have remained unfunded. In 2006, after recommendations of the Advisory Committee and a review of the budget, the campus released funds for the three faculty positions tied to existing clusters that had been put on hold. Given the fact that the campus has received no new funds for the initiative since its inception,

and since the proposals for the five approved (but unfunded) cluster proposals were written eight years ago, there is little, if any, likelihood that these clusters will be funded.

By establishing the CHI, the campus acknowledged that existing curricula demands, departmental traditions, and faculty governance often limit departmental opportunities to pursue new directions in faculty hiring. The challenge is that departments may be unable to hire faculty who pursue new, more experimental, or less established areas of research, or who pursue interdisciplinary initiatives that are distant from the core of a single discipline. The prevailing academic cultures and structures tend to replicate existing areas of expertise, reward individual effort rather than collaborative work, limit hiring input to a single department within a single school/college, and limit incentives and rewards for interdisciplinary and collaborative work.

Since the UW-Madison launched the CHI, this innovative initiative has been studied and is being replicated or adapted by major universities across the country. For example, in November 2007 the University of Michigan announced it will invest \$30 million to encourage the hiring of 100 new tenure-track faculty members with the goal of expanding interdisciplinary teaching and research.

Cluster Administration and Fiscal Management

The Office of the Provost coordinates the CHI under the direction of the Vice Provost for Faculty and Staff. This structure creates an overall program management situation in which every three to five years a new faculty member comes into the Provost's Office and assumes the vice provost position and its cluster responsibilities. Thus, the Provost's Office needs to pay attention to the long term continuity for continual development and improvement of cluster and/or other interdisciplinary central or cross-college administration issues. Currently, long term continuity for Cluster Initiative administrative policies and practices is provided by an assistant vice chancellor who is a member of the academic staff, and thus not expected to rotate in and out of the Provost's Office every few years. And, to ensure faculty input across campus and to provide advice and policy guidance for clusters and other interdisciplinary efforts on campus, the Provost's Office appointed a Cluster Hire/Interdisciplinary Advisory Committee in fall 2004.

Cluster salaries are provided centrally. Fiscally, the state funds are allocated through the Vice Chancellor for Administration. The Wisconsin Alumni Research Foundation and the University of Wisconsin Foundation funds are allocated through the Graduate School. Each cluster's lead dean is responsible for coordinating an interdisciplinary search and screen for each cluster faculty position. Requests to replace cluster faculty that leave UW-Madison are reviewed through the Provost's Office and authorized, provided there is adequate documentation of the success of the cluster in research, teaching and outreach. A lead dean and cluster coordinator can also request course replacement requests for faculty on leave and not paid through central funds to cover the courses that would have been taught by the faculty, provided the costs do not exceed those of the cluster faculty salary. Salary savings from faculty who are on grant funds are retained by the school/college through which the appointment is budgeted and can be used in the same way that salary savings from traditional faculty hires are used (e.g., to pay for covering courses, flexible funding for research support, etc.).

Outside of the central functions of the Provost's Office, the Cluster Hire Initiative operates within the decentralized structure of the university. Cluster leader roles on campus (vice provost, lead deans and other involved deans, cluster coordinators, department chairs of tenure home departments, cluster search and screen committees, and the Graduate School) are articulated on the Office of the Provost Web site at <http://www.clusters.wisc.edu/pages/show/1>. These roles, responsibilities and a list of currently known best practices are meant to assure that the campus hires, nurtures and retains excellent faculty via the cluster initiative, and to create an environment that fosters the ongoing development of interdisciplinary research, teaching and outreach. Cluster faculty are expected to fulfill the normal responsibilities of a faculty member for teaching, research and public service, unless the cluster proposal and letter of appointment specify otherwise.

Overall, this management structure creates real-time information gaps in terms of when faculty are hired and when faculty leave. Since we have not yet reached a point where we have hired all of the authorized faculty lines (something we should accomplish by 2009) and without a long term track record, it is hard to project how many faculty will leave clusters each year for positions elsewhere or through retirement. Our current best estimate is that in 2009 or 2010 we will reach maximum expenditure of the cluster funds, which might create a situation where some replacement lines may not be authorized for a period of time due to a lack of funds.

The 2003 Cluster Evaluation Report

In 2002, Provost Peter Spear appointed an ad-hoc advisory committee to evaluate the Cluster Hiring Initiative. Through the spring of 2003, the committee gathered quantitative and qualitative information and feedback from deans, department chairs, cluster search and screen chairs and cluster faculty. The November 2003 Report of the Provost's Ad Hoc Advisory Committee to Evaluate the Cluster Hiring Initiative is located at <http://www.provost.wisc.edu/docs/clusterreport.pdf>.

The ad hoc advisory committee report stated that there was campus-wide and enthusiastic support about the initial success of the developing clusters and the report recommended the campus continue to foster and support the Cluster Hiring Initiative. But, at that time, it was deemed too early to quantitatively assess how well the Cluster Hiring Initiative was meeting its goals and objectives since the number of cluster faculty was too small and the program too new to generate statistically significant data. However, the qualitative information indicated that faculty hired through the initiative were productively engaged in interdisciplinary teaching, research and outreach, and the campus deans, department chairs, and faculty maintained their support of the CHI.

Given the early stage of cluster development in 2003, and concerns over cluster faculty hiring timelines, how cluster faculty fair compared to traditionally-hired faculty, and whether the clusters were helping to change our departmentally-based culture, the report called for another self-evaluation within three to five years. This report is a result of that recommendation.

A number of activities were undertaken to investigate the current state of the CHI and to provide analysis and recommendations for this report. The overview process was charged and overseen by Vice Provost Laurie Beth Clark. In 2005-2006, the cluster coordinators were interviewed to provide a perspective of the entire cluster experience (Appendix C: Cluster Coordinators/Faculty Interviewed and Interview Questions). Jennifer Gulig Klippel, a master's degree student in the La Follette School of Public Affairs, conducted 39 of the interviews and Peyton Smith, assistant vice chancellor, conducted ten interviews. Thirty-four of the 49 clusters had faculty coordinators who were on campus prior to the cluster program, and many of those coordinators served on the initial cluster search and screen hiring committees. Fifteen of the 49 clusters were coordinated by one of the cluster-hired faculty. Lead deans are responsible for appointing a cluster coordinator for each cluster. The interviews captured the perspectives of faculty who understood the cluster process and were familiar with the campus culture outside of the clusters, and faculty whose only experience on campus was through a cluster. The interviews also provided information on developmental issues and themes faced by all clusters.

Margaret Harrigan, with the Office of Academic Planning and Analysis, collected and prepared quantitative data related to the CHI for much of the data tables in this report. Andrew I. Epstein, a doctoral student in Educational Policy Studies, analyzed the qualitative and quantitative data, conducted further interviews and research, and prepared a first draft report. In March 2007, the Provost's Office also hosted a Conference on Interdisciplinarity: *The Cluster Hiring Initiative*, which focused entirely on evaluating the CHI and analyzing the initiative as a case study to improve other interdisciplinary efforts on campus. A first draft of an evaluation report was widely circulated to the campus community and an open town meeting was held as part of the conference to seek further input into the self-study recommendations and conclusions. Finally, this report was shaped and reviewed by members of the Cluster/Interdisciplinary Advisory Committee from 2006-2008 who were appointed through the Provost's Office (Appendix D: Cluster/Interdisciplinary Advisory Committee to the Provost).

Key Contributions of the Cluster Hiring Initiative

The intensive cluster coordinator and faculty interviews formed the basis for the Provost's Office to produce a new Cluster Hire Initiative Web site that contains summaries of key contributions of the clusters. The site contains abstracts of how each cluster is focused; examples of research, teaching and outreach accomplishments; and details of how each cluster is structured to best foster collaboration among the cluster and affiliated faculty. A review of this site will show a wide range of new interdisciplinary grants, courses, graduate training programs, and outreach programs and partnerships. To review the specific accomplishments of each cluster (which are not contained in this report), please see the Cluster Hiring Initiative Web site (www.clusters.wisc.edu). The cluster coordinator and faculty interviews and subsequent follow-up, such as the development of the Cluster Web Site, also formed the basis for some of the content of this report.

Fostering Interdisciplinary Methodologies and Competencies across Campus

Since its inception, the CHI has provided new insight into the conditions under which collaboration across disciplines and across institutional structures can flourish. As each new phase of cluster hiring passed, and as existing clusters matured, it became clear that clusters that were more successful in creating an interdisciplinary environment actively put a high priority on team work and collaboration through regular meetings, conference/event sponsorship, collaborative research and outreach activities, and team teaching. Both formal and informal face-to-face collaborations were also reported as essential to the productivity and functioning of clusters.

Further, cluster coordinators and faculty report that the clusters have been a major catalyst for new discoveries, interpretations and applications, and have improved the conditions for the development of new interdisciplinary research methods and theoretical constructs. How this happens in each cluster is influenced by a number of variables, such as the particular skills and strategies the cluster faculty use to collaborate, the compatibility of disciplinary cultures, the availability of resources, and institutional supporting structures.

As a result, the clusters are a diverse lot defying easy categorization. This is because each cluster and its faculty and affiliated faculty often employ different structures, strategies and approaches to create productive cross- and interdisciplinary-collaborations.

Fostering Research Networks: Breaking Down Barriers and Building Bridges

A deliberate focus on the sciences in the early phases of cluster development is reflected in the fact that nearly half of all clusters are made up exclusively of faculty with tenure homes in the biological and physical sciences. About half of all clusters have faculty members from two or more schools or colleges. Three-quarters of all clusters have faculty members from two or more academic departments. A few clusters (some were formed with only one or two new faculty) are composed of faculty who are all from the same department or unit, which reflects that the CHI was also designed to hire faculty with specific expertise needed to strengthen existing interdisciplinary departments or programs.

Cluster coordinators report that most clusters are highly integrated throughout UW-Madison and have created many cross departmental, divisional, and school/college interactions. More than two-thirds of the clusters are part of a larger center, program or group focused around instruction or research that contains affiliated members outside of the cluster structure. In these cases, the clusters have served to catalyze even more interactions. Most of the other clusters have coalesced entirely new groups of affiliated faculty since being formed. Clusters have also strengthened new areas of interdisciplinary research within existing departments by adding new strengths to departments and nurturing connections with faculty outside the home departments.

Almost all coordinators report that one of the greatest strengths of their cluster was cultivating a more versatile approach to their topic by crossing barriers between departments or building bridges to new departments. Many departments report a greater interdisciplinary culture in their tenure home departments. Also, the CHI was essential in helping them hire new faculty they

could not have hired through the traditional departmental mechanisms. Some recently-hired cluster faculty are now department chairs or serve on divisional and other university committees, further integrating an interdisciplinary understanding into the institutional culture.

In addition to fostering new connections across departmental, school and college boundaries, many clusters have developed an extensive network of connections with members of other clusters. In fact, faculty in clusters or interdisciplinary programs seem to cluster frequently with other interdisciplinary faculty. For example, in fall 2006, 37 cluster coordinators reported connections with at least one other cluster while 26 coordinators reported connections to at least two or more other clusters via shared research, education and outreach activities (Appendix E: Cluster to Cluster Sociogram). Most clusters are also connected to local, regional, national, and international networks, another factor that coordinators report as a major strength of their interdisciplinary efforts.

Extramural Research Funding

Many coordinators report that the research accomplishments are the greatest strength of their cluster. In fact, more than 20 coordinators report that cluster faculty have added significant research prestige to the university by publishing books and articles in major journals. In some cases, cluster faculty are now editors of flagship journals, and still others have been awarded prestigious awards for their research and teaching accomplishments. Several clusters have also registered patents with the Wisconsin Alumni Research Foundation and, as a result, have attracted funding from the private sector.

Cluster faculty and the clusters themselves are instrumental in generating research funding. Cluster faculty have been successful in helping to obtain new large-scale interdisciplinary research and training grants, especially via federal competitions where interdisciplinary research and application is increasingly important. Further, more than a dozen coordinators reported their clusters helped build a new research specialty (or significantly enhanced an existing program or specialty) in which UW- Madison is now a world leader.

While we do know that clusters have been involved in bringing in hundreds of millions of dollars in grants since the initiative inception, it is not possible to get an accurate assessment of the total impact. This is because UW-Madison's reporting system currently only tracks two project investigators names for each research project funded, which does not acknowledge the contributions of other faculty on the grants, particularly large-scale multi-million dollar grants (which are increasing in frequency). The problem of faculty recognition for large-scale interdisciplinary grants is not endemic to our campus. Its national scope is evidenced by the National Institutes of Health working to revise its criteria for recognizing principal investigators for interdisciplinary grants.

Comparative data on extramural funding awards between cluster and non-cluster faculty listed as a principal investigator in the 2003 evaluation report showed that on average the annual grant funding for cluster hires in the biological and physical sciences divisions was higher while the average for cluster faculty in the social sciences and humanities was lower than other faculty in those divisions. The current analysis is not much different. The average award per cluster faculty

compared with the average award for all faculty is close to parity. When broken down by divisions in 2005-2006, awards for cluster faculty in the biological sciences were appreciably larger; awards in physical sciences were slightly lower; while grants for cluster faculty in the social sciences, and the arts and humanities appreciably lagged behind those of non-cluster faculty (Appendix F: Extramural Research Awards: Table 1 “Cluster Faculty and All Faculty Extramural Research Awards by Year;” Table 2 “Cluster Faculty and All Faculty Extramural Research Awards by Division, 2005-2006”).

Teaching

A significant accomplishment of the CHI is the development of new and updating of existing and languishing graduate and undergraduate interdisciplinary courses and program tracks. Nearly every cluster reports the development of new courses and several have developed new program tracks (Appendix G: A Sampling of New Courses/Program Tracks Created by Cluster Faculty). For example, the cluster initiative has completely revitalized the UW-Madison Religious Studies Program and created an entirely new undergraduate biomedical engineering degree. More than half the clusters report that new program tracks are helping to attract higher quality graduate students. Further, as a result of several large scale graduate student training grants brought in by cluster faculty, the UW-Madison has become a national or international center for graduate training in many fields.

The 2003 evaluation report found that cluster faculty teaching loads compare and were similar to traditional faculty teaching loads for both group and individual instruction. However, the authors pointed out that because of the small number of cluster faculty, one large course taught by a cluster faculty member could change the average instruction section significantly. Since that time, cluster hire faculty teaching loads for group instruction remain comparable to traditional faculty (with slight differences over the semesters) while cluster faculty teaching loads for individual instruction have been slightly higher (Appendix H: Summary of Instructional Activity of Faculty Cluster Hires).

Other advances in teaching and learning include such things as incorporating techniques from the biological sciences into the laboratory components of undergraduate chemistry courses, creating new cross-college competitions for training and internships, new internships with the private sector, and new opportunities for interdisciplinary laboratory and fieldwork experiences. Several clusters also offer opportunities for interdisciplinary skill development targeted at minority students at the high school or undergraduate levels by providing special summer academic programs and opportunities.

Outreach and Public Engagement

Almost every cluster reported involvement with outreach activities. One-half of the clusters report the development of new outreach activities, such as conferences, collaborative research, seminars or speakers series that are open to the public. Nearly two-thirds of all clusters built partnerships between UW-Madison and other universities and educational institutions, businesses, governmental agencies, or other groups (e.g., GE Medical, Johnson Controls, the Wisconsin Department of Natural Resources, Wisconsin Department of Development, the

Wisconsin Arts Board, various public and tribal schools, and community museums). One cluster hosts visiting faculty residencies each year, which include requirements for K-12 and community presentations, performances, concerts, exhibits and symposia. In fact, many cluster coordinators report that making their research more accessible to the public is one of the greatest strengths of their clusters.

Problems and Challenges

Institutional Constraints

Cluster coordinators and faculty report that interdisciplinary work often requires increased time and effort, produces lower rewards per unit of effort, and confronts institutional, departmental and disciplinary barriers. The increased effort arises from both the intellectual and administrative organization of scholarship. Cluster faculty must learn how to work collaboratively and develop an interdisciplinary approach to their scholarship and teaching, which are prerequisite competencies for productive interdisciplinary inquiry. Scholars trained in a single discipline or methodology must gain competent skills in a second or even third area of knowledge, as well as learn the craft of scholarly production in other disciplines – styles of presentation and writing, co-authorship norms, journal and prestige rankings, etc. This means that faculty who engage in interdisciplinary research must excel in both traditional discipline-based scholarship (in order to ensure their promotion) while maintaining interdisciplinary scholarship (in order to ensure the productivity of the cluster).

Some cluster faculty have appointments and responsibilities in more than one department, which means they have extra faculty meetings, teaching schedules, seminar series, committee assignments, outreach activities, etc. Having to deal with multiple sets of administrators and different departmental administrative practices can be time consuming. While research often can count for both units, faculty report that most of the teaching, outreach and service obligations need to be tailored to each department. As a result, the process of earning the full endorsement for tenure of one's home department can be more complex and challenging.

While interdisciplinary research, teaching and learning is recognized within each division's tenure policies, there are no overall guidelines for the evaluation of interdisciplinary scholarship. As a result, most coordinators say they are working to increase the legitimacy and visibility of interdisciplinary research and advocating for cluster faculty in promotion and tenure decisions. Further, almost every cluster coordinator highlights the need for adequate mentoring of junior cluster faculty, and by extension all non-tenured interdisciplinary faculty. While some coordinators make sure to check in regularly with their new faculty, most coordinators report mentoring happens primarily in the cluster faculty's home department.

The issue of documenting interdisciplinary scholarship in the tenure and merit process is not unique to cluster faculty, but rather applies to interdisciplinary faculty in general. Concurrent with the evaluation of the CHI and the production of this report, the Nelson Institute for Environmental Studies developed an adapted a set of Guidelines for Merit Evaluation and Criteria for Excellence in Interdisciplinary Scholarship in November 2007. These guidelines are located at <http://www.nelson.wisc.edu/facstaff/policies/criteria.pdf>.

Interdisciplinary faculty in the arts and humanities and social sciences might face even more difficulties due to the traditions of the disciplines. For example, faculty in these divisions report fewer outlets and funding sources for interdisciplinary scholarship and research than in the biological and physical sciences. Further, faculty in these divisions report that the evaluation of interdisciplinary scholarship is less developed and understood in their disciplines than in the hard sciences. For example, since interdisciplinary articles and books or proposals are usually co-authored, scholarly work or proposals with multiple authors or investigators can greatly increase the risk of having a manuscript or proposal rejected. Also, individual participants often receive less credit in promotion and tenure decisions, creating disincentives for collaboration. On the other hand, scholars in the biological and physical sciences report greater acceptance of their work in teams and co-authored articles. These examples reflect the different ways in which disciplinary cultures confer distinction.

Another recent campus survey highlighted similar issues and barriers related to interdisciplinary collaboration among faculty. The *2006 Study of Faculty Work Life at the University of Wisconsin-Madison*, conducted by the Women in Science and Engineering Leadership Institute, was designed to understand quality of work life issues for faculty. The study results are located on the Web at <http://wiseli.engr.wisc.edu/initiatives/survey/results/facultypost/contents.htm>.

This study showed that UW-Madison faculty in the arts and humanities division are the least likely to collaborate outside their own departments while faculty from the biological sciences division are the most likely to collaborate. The analysis further shows that faculty from the arts and humanities who engage in interdepartmental collaboration tend to be more senior and tenured professors, suggesting that the process of getting tenure remains a powerful conforming influence. Further, the cluster coordinators report that there are still many departments on campus that undervalue interdisciplinary collaboration and that administrators and faculty in positions of power tend to protect the core missions of their departments. Thus, it can be hard for cluster and interdisciplinary faculty to compete for resources, staff and space.

Despite these problems, the work life survey showed that those faculty engaged in interdisciplinary collaborations expressed more satisfaction with their resources, the tenure process, their departmental climate, and their jobs and careers. They also report significantly less isolation than other faculty. Nonetheless, faculty from across campus report that despite these barriers, UW-Madison is known for interdisciplinary work and, thus, has attracted a type of faculty, both within and outside of clusters, who believe in and prefer interdisciplinary collaboration and scholarship, which overall creates a favorable interdisciplinary environment.

Given these potential constraints there is concern over how junior cluster faculty fair in the tenure process compared with other non-cluster faculty. Since its inception, 69 percent of CHI faculty were hired as assistant professors without tenure compared with 79 percent of traditional faculty who were hired during the same time. So far, cluster faculty are earning tenure at the same rate as their non-cluster counterparts. Resignation rates of cluster faculty are nearly identical to their non-cluster faculty counterparts and are shown in Appendix I (Appendix I: Cluster Faculty Hiring, Promotion, and Resignation Rates; Table 1 “Faculty Hired through the Cluster Hiring Initiative by Rank at Hire: 1999-2000 through 2007-2008” Table 2 “Promotion Rates for Total Probationary Faculty and Cluster Probationary Faculty by Year of Hire” Table 3

“Resignation Rates for Total Probationary Faculty and Cluster Probationary Faculty by Year of Hire” and Table 4 “Resignation Rates for Total Tenured Faculty and Cluster Tenured Faculty by Year of Hire”).

Further, as of fall 2007, 78 percent of all UW-Madison faculty were tenured compared to 54 percent of cluster faculty who were tenured. However, to put that in perspective, tenure rates for all faculty (total of 2,010) include a majority of faculty who have been on campus more than 10 years, many of which have 20, 30 and even 40 years experience. Contrast that to the longest standing cluster faculty who will have been on campus for only eight years and one semester as of this report.

Start-up Packages and Administrative Support

During the first years of cluster faculty hiring (1999-2002), CHI faculty start-up packages were on average larger than non-CHI startup packages. This reflected the heavy emphasis on the biosciences and the recruiting of senior faculty during the first two CHI rounds when nearly a third of cluster faculty were hired as tenured professors compared to only 22 percent of all UW faculty. However, as cluster funds were expended and with most faculty lines now filled, there were no longer any extra funds to contribute to the start-up packages. As a result, all cluster faculty start-up packages are now mediated by the same sources of funding as the rest of campus (a mix of departmental, school/college, and Graduate School funds). Many coordinators expressed frustration that the cluster initiative no longer has extra money for start-up packages to attract top faculty when making replacement hires after an established cluster faculty member leaves. It should be noted that the issue of adequate start-up packages is not unique to a cluster hire, but happens with any faculty hire in high-demand areas.

Outside of start-up packages, the campus had no institutional support to help jump-start new clusters and foster interdisciplinary inquiry. In response to the identified need to foster cluster infrastructure, the Provost established a Cluster Hiring Enhancement Grant campus-wide competition in January 2002 with an annual ongoing commitment of \$200,000 of the overall cluster budget to strengthen cluster development. The grants provide partial support for graduate students, program assistants, laboratory assistants, and for fiscal, web site and other expenses related to cluster programmatic activities and objectives. The funds are awarded for up to three years with a maximum of \$25,000 per year per cluster. This infrastructure fund will continue to provide \$200,000 annually for cluster enhancement until allocation of those funds will negatively affect the number of cluster faculty lines. Our current best estimate is that we will reach that limit and will not be able to support further enhancement grants from the cluster funds after 2010. Of course, this all depends on the number of faculty on leave and the number of cluster faculty who leave, and their subsequent replacement positions.

Even with the Cluster Enhancement Grants, many cluster coordinators report that the work of building infrastructure for their cluster often falls on them and the burden of the extra administrative tasks creates burnout. For many, the growth and success of their cluster has been a mixed blessing as they report these administrative demands cut into their teaching and research responsibilities. Coordinators also report that they constantly have to fight and advocate for laboratory and office space, computer and other supplies, or simply to get mail boxes and

phones. While these problems are not unique to clusters, they can be more complicated in departmental and center or program politics.

Increasing Campus Diversity

One of the original goals of the CHI was to assist in the fulfillment of other missions of the university, specifically to increase faculty diversity. In fact, 25 percent of cluster coordinators report that their cluster enhanced diversity in their field (with half reporting that their cluster brought prominent female scientists to campus). However, on the whole, the CHI has not fully achieved the goal of increasing campus diversity overall.

Since its inception, the percentage of minority faculty hired as cluster faculty has been nearly equal to that of the percentage of other departmentally-based faculty hired. However, the percentage of females hired through the CHI is below the percentage of female faculty hired through traditional faculty lines (Appendix J: Faculty Hired through the Cluster Hiring Initiative: 1999-2000 through 2007-2008 by Gender and Race/Ethnicity). One explanation for hiring fewer women cluster faculty than the campus average was the focus on recruiting senior faculty in the biological and physical sciences during the early cluster hiring rounds, since senior faculty in these disciplines tend to be predominantly male. However, after the first three cluster rounds women were hired in increasing rates. While the rate of women faculty hiring has been slow, some clusters have made progress in attracting increased gender diversity in fields that have been traditionally dominated by men.

Further, the data illustrates that despite relative parity in race/ethnicity between the hiring of cluster and all faculty (both groups hired roughly 25 percent non-majority faculty over the same time period), the majority of this diversity is represented by Asian faculty at 19 percent of cluster hires. Only two percent of cluster faculty are Black, two percent Hispanic, and two percent Native American. This is slightly different from the total of the minority faculty hiring across campus during the same period (15 percent Asian, four percent Hispanic, three percent Black, and one percent Native American). However, it should be noted that one of the clusters, the Interdisciplinary Arts Residency Program, brings one or two visiting faculty and guest artists to campus each year, many of whom are women or non-majority faculty. Since visiting faculty positions are actually hired as academic staff, the visiting faculty are not counted as women or minorities and thus are not reflected in the data analysis.

In addition to having an impact on faculty diversity, several cluster coordinators emphasized that their clusters have developed new summer and research programs for high school and college minority students and have developed new outreach programs for members of minority communities.

Spring 2008 Cluster Coordinator Survey

Two months before the completion of this report, a web-based survey was sent to cluster coordinators to qualitatively gauge the level of interdisciplinary teaching, research and outreach (Appendix K: Spring 2008 Cluster Coordinator Survey Results). Responses were received from

38 of the 49 clusters. Since the analysis was qualitative, the data is not included in other sections of this report that cover some of the same issues, but rather is presented here in summary form.

When it comes to teaching, 37 clusters have created new undergraduate or graduate courses and 12 clusters have established or will be creating new degree programs. In the research area, faculty from 23 clusters have prepared research proposals with faculty from the same cluster, 21 clusters have received funding from sources external to UW-Madison, 16 have receiving funding from UW-Madison sources (gift and foundation funds), and faculty from 10n clusters have obtained a federal patent. Twenty six clusters have engaged in outreach or public engagement activities and 29 clusters have facilitated extracurricular activities on campus. Only 15 clusters have a dedicated physical location while 25 are administered under the auspices of an academic department, center or program.

Conclusion and Recommendations

After careful analysis and deliberation, we conclude that the CHI is a success and is meeting its objectives. In only a few years the CHI has created or strengthened 49 areas of academic interdisciplinary inquiry that match the teaching, research and outreach productivity of departmentally-based faculty. Since many of the insights gained through evaluating the clusters apply to interdisciplinarity in general, the following recommendations are made to foster the environment for cluster and other interdisciplinary efforts across the campus.

1) Continue to support and grow cluster and interdisciplinary efforts across campus

- Maintain full funding and support of the current number of cluster faculty.
- Expand the cluster initiative through a centrally-administered, faculty-driven program that annually allocates 10 percent of all faculty lines to “institutional innovations,” such as the CHI (current CHI lines equal 6.6 percent).
- Establish an “Interdisciplinary Common Fund” to support new research, teaching and outreach, and encourage schools/colleges to work cooperatively to reallocate or find new resources to fund additional clusters around new areas of interdisciplinary inquiry (i.e., clinical translational research, biofuels initiative).

2) Create new supportive mechanisms and funding streams to foster interdisciplinarity

- Maintain the Cluster/Interdisciplinary Advisory Committee to foster cross-campus interdisciplinary efforts.
- Appoint a Vice Provost of Interdisciplinary and Institutional Innovation to coordinate the on-going evolution of the CHI and all interdisciplinary programs and efforts aimed at institutional change.
- Work with the UW Foundation to develop strategies for raising funds and endowments for interdisciplinary efforts that are not anchored in traditional schools/colleges/departments.
- Establish an “Interdisciplinary Infrastructure Fund” to provide administrative and program support for efforts not connected to traditional institutional infrastructure. Meanwhile, continue to allocate \$200,000 annually in cluster enhancement grants until those funds would negatively impact the number of faculty hired.
- Maintain a campus cluster Web site to share information and best practices.

3) Develop methods to evaluate cluster and interdisciplinary innovations and success

- Work with divisional committees to develop tenure guidelines and criteria for the documentation and evaluation of interdisciplinary scholarship, and to develop procedures and guidelines for cross-divisional representation on tenure committees for interdisciplinary-focused faculty.
- Establish data collection and accounting mechanisms to measure and document a range of cluster/interdisciplinary efforts and productivity (i.e., research grants, patents generated, new courses, certificates and degrees developed, papers published, etc.).
- Develop a process and criteria for the Vice Provost working with the Cluster/Interdisciplinary Advisory Committee and cluster coordinators to comprehensively evaluate each cluster every five years.
- Promote interdisciplinary efforts campus-wide through supporting ongoing conferences on interdisciplinary issues.
- Prioritize ethnic and gender diversity hiring in cluster faculty replacement positions.

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Appendix A

Patterns in UW-Madison Faculty Hiring

YEAR	Number of New Hires	Number of Cluster Hires	Cluster Hires as % of New Hires	Total Number of Faculty in October	
				Headcount	FTE
1982-83	106			2289	1954
1983-84	138			2314	1982
1984-85	146			2328	1979
1985-86	129			2416	2176
1986-87	92			2400	2120
1987-88	117			2370	2118
1988-89	197			2407	2161
1989-90	148			2435	2205
1990-91	145			2444	2227
1991-92	128			2421	2221
1992-93	112			2430	2225
1993-94	94			2419	2220
1994-95	70			2371	2156
1995-96	76			2285	2078
1996-97	70			2210	2013
1997-98	86			2171	1986
1998-99	98			2135	1957
1999-00	134	20	15%	2123	1939
2000-01	156	24	15%	2174	2004
2001-02	156	29	19%	2213	2047
2002-03	123	19	15%	2225	2060
2003-04	99	23	23%	2236	2076
2004-05	97	17	18%	2238	2064
2005-06	106	8	8%	2220	2053
2006-07	113	6	5%	2210	2054
2007-08	103 *	8 *	8% *	2198	2033

* indicates preliminary data.

Source: UW-Madison tenure file, IADS appointment system, and cluster hires data: February 2008.

Notes: New hires are counted from May 16 to May 15 in each year. Total number of faculty are counted as of October of each year. Headcount totals include faculty on leave and those with administrative titles such as Dean. FTE counts include only those paid as faculty on the October payroll. In 1985-86, faculty were transferred from UW-Extension and are not counted as new hires. The legislature authorized over 100 additional faculty positions in the 1987-89 Biennial Budget.

Prepared by: Margaret Harrigan, Office of Academic Planning and Analysis
06/24/08

Appendix B
Clusters and Faculty Positions Rounds 1-5
February 2008

Cluster Name	Lead Dean/ College	Round Number	Positions Awarded	# of Faculty Hired	Authorized Faculty Searches
Round I					
Bioethics	SoMPH	1	1	1	
Biophotonics	L&S	1	3	3	
Functional Brain Imaging	SoMPH	1	2	2	
Genomics	CALS	1	5	6	
International Public Affairs (La Follette)	L&S	1	3	3	1
Nanophase Inorganic Materials & Devices	ENG	1	3	4	
Zebrafish Biology	L&S	1	3	3	
Round I TOTAL		7 total clusters	20	22	1
Round II					
Chemical Biology	CALS	2	3	3	
Chemistry	L&S	2	2	2	
Computer Engineering	ENG	2	2	2	
Computer Sciences	L&S	2	2	2	
Cultural Studies in Global Context	L&S	2	3	4	
Comparative Political Economy	L&S	2	2	1	1
Food Pathogens and Toxins	CALS	2	4	4	
Biomedical Engineering	SoMPH	2	3	3	
Religious Studies	L&S	2	4	3	1
Structural Biology	CALS	2	3	3	
Very High Energy Astrophysics & Cosmology	L&S	2	2	2	
Interdisciplinary Arts Residency Program *	L&S	2	2	1 or 2 per semester	
Round II TOTAL		12 total clusters	32	30	2

Round III					
African Diaspora	L&S	3	3	2	1
Cognitive Sciences	L&S	3	3	3	
Communication Technologies	L&S	3	3	4	
Computational Sciences	ENG	3	3	2	
Energy Sources & Policy	ENG	3	6	4	2
Entrepreneurship/Technology	BUS	3	4	3	1
Ethnic Studies	L&S	3	4	4	
Global Governance & International Finance	International Studies	3	2	3	
Land Use	CALS	3	2	3	
Law, Society and Justice	L&S	3	3	2	1
Political Economy	L&S	3	2	2	
Science Studies	L&S	3	2	2	
Vitamin D	CALS	3	1	1	
Women's Health/Biology of Sex and Gender Differences	SoMPH	3	3	3	
Round III TOTAL		14 total clusters	41	38	5
Round IV					
Agroecology	CALS	4	3	3	
Expressive Culture & Diversity in the Upper Midwest	L&S	4	3	3	
Functional Organic Material	L&S	4	3	3	
Mathematical Physics – String Theory	L&S	4	3	3	
Middle Eastern & Islamic Studies	L&S	4	2	2	
Molecular Biometry	CALS	4	3	3	
Poverty Studies	L&S	4	3	2	1
Symbiosis	CALS	4	3	4	
Translational Research – Neurodegenerative Diseases	SoMPH	4	4	4	
Visual; Culture	SoHE	4	3	2	1
Round IV TOTAL		10 total clusters	30	29	2

Round V					
Advanced Materials by Design: Theory and Computation	ENG	5	3	2	1
American Indian Studies	L&S	5	3	2	1
Disability Studies	L&S	5	3	2	1
International Environmental Affairs and Global Security	IES	5	4	4	
Stem Cells and Regenerative Medicine	SoMPH	5	3	3	1
Systems Biology	SoMPH	5	3	2	1
Round V TOTAL		6 total clusters	19	15	5
GRAND TOTAL *		49 total clusters	142	132	15
Total Cluster Positions (including school/college matching positions)			147		

* The Interdisciplinary Arts Residency Program brings one or two visiting Artist in Residence faculty to campus each semester as part of its cluster

Appendix C Cluster Coordinators/Faculty Interviewed and Interview Questions

Coordinators/Faculty and Interviewed

Advanced Materials by Design: Theory and Computation	Juan de Pablo
African Diaspora and the Atlantic Research Circle	Teju Olaniyan
Agroecology	Michael Bell
American Indian Studies	Ada Deer
Bioethics	Robert Streiffer
Biomedical Engineering	Robert Radwin
Biophotonics	Timothy Gomez
Chemical Biology	Laura Kiessling
Chemistry	Jim Skinner
Cognitive Sciences	Charles Kalish
Communication Technologies Research	Dietram A Scheufele
Comparative Political Economy	Joel Rogers & Jonathan Zeitlin
Computational Sciences	Nigel Boston
Computational Systems Biology	David DeMets
Computer Engineering	Christopher DeMarco
Computer Sciences	Gori Sohi
Cultural Studies in a Global Context	Susan Friedman
Disability Studies	Marsha Seltzer
Energy Sources and Policy	Douglas Reinemann
Ethnic Studies	Camille Guerin-Gonzales
Expressive Culture & Diversity in the Upper Midwest	James Leary & Joseph Salmons
Food Pathogens and Toxins	Mike Pariza
Functional Brain Imaging	Richard Davidson
Functional Organic Material	Mark Ediger
Genomics	Lloyd Smith
Global Governance & International Finance	Donald Nichols
Initiative for Studies in Technology Entrepreneurship	John Surdyk
Interdisciplinary Arts Residency Program	Susan Cook
International Environmental Affairs and Global Security	Jonathan Foley
International Public Affairs	Donald Nichols
Land Use	Richard Bishop
Law, Society and Justice	Donald Downs
Mathematical Physics – String Theory	Albert Klemm
Middle Eastern Studies	David Morgan
Molecular Biometry	Paul Milewski & Brian Yandell
Nanophase Inorganic Materials & Devices	Eric Hellstrom
Political Economy	James Montgomery
Poverty Studies	Maria Cancian

Religious Studies
Science and Technology Studies
Stem Cells and Regenerative Medicine

Structural Biology
Symbiosis

Translational Research in Neurodegenerative Diseases
Very High Energy Astrophysics & Cosmology
Visual Culture Studies
Vitamin D
Women's Health/Biology Sex and Gender Differences
Zebrafish Biology

Charles Hallisey
Joan Fujimura
Timothy Kamp,
Linda Hogle &
William Murphy
George Phillips
Heidi Goodrich-Blair,
Margaret McFall-Ngai &
Edward Ruby
Albee Messing
Albert Klemm
Laurie Beth Clark
John Wesley Pike
Molly Carnes
Francisco Pelegri

Interview Questions

- 1) How would you describe your cluster focus?
- 2) Could you please describe the goals and objectives of your Cluster?
- 3) Could you please describe the potential or actual benefits derived from your Cluster?
- 4) Has the cluster focus changed or evolved since the cluster was proposed and established?
- 5) How has the cluster activities fostered student's knowledge?
- 6) Do cluster faculty teach courses that only serve cluster needs, a mix of departmental and cluster-needs courses, or must all courses they teach serve both needs?
- 7) How has your cluster furthered research knowledge?
- 8) Has the cluster worked together to secure grants?
- 9) Have any of your cluster faculty been significant players in other interdisciplinary grants?
- 10) What outreach activities has your cluster been involved with?
- 11) Have any of your cluster received programmatic awards or any of your faculty/ students/ staff received special citations?
- 12) Are there any other ways your cluster helps foster interdisciplinarity?
- 13) What does it take to keep a Cluster clustering and how do you help the faculty do so?
- 14) Do you foster interaction between the faculty who put the cluster proposals together and the newly hired CHI faculty?
- 15) How do you distinguish between who was hired for the cluster and other affiliated faculty?
- 16) What are the strengths and successes of your CHI, and how can we build on them?
- 17) Are CHI assist profs being adequately mentored and who is overseeing the mentoring?
- 18) What do you see as the major challenges/weakness facing your cluster?
- 19) What do you specifically need to ensure that your Cluster prospers?
- 20) Have you or anyone involved in the cluster done anything to evaluate your cluster?
- 21) Can you think of ways your cluster has interacted or worked with other clusters?
- 22) Is there anything you would like to add or say about the clusters?

Prepared by Jennifer Gulig Klippel, May, 2006

Appendix D
Cluster/Interdisciplinary Advisory Committee to the Provost

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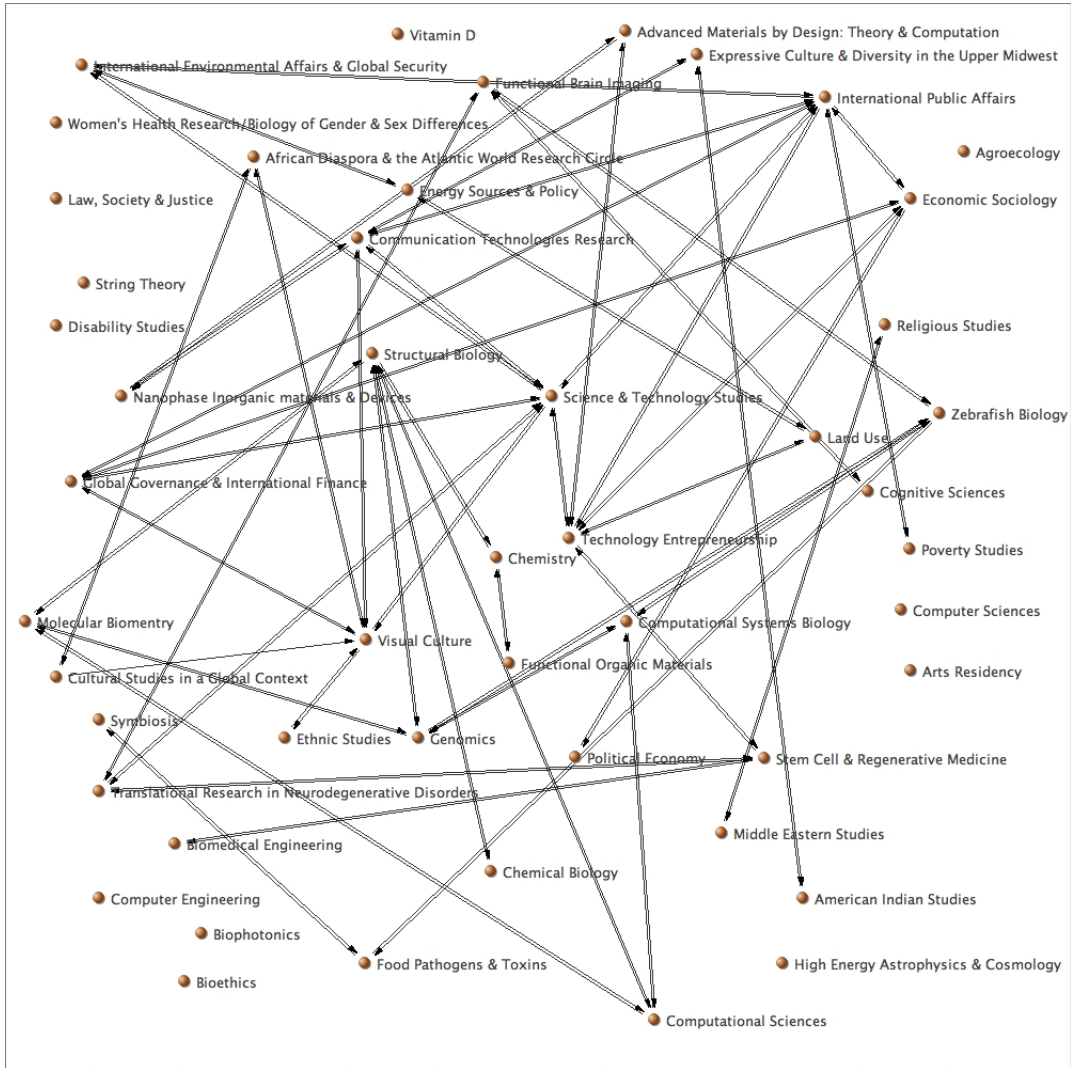
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Appendix E Cluster to Cluster Sociogram



*Notes: Outliers include clusters that have not yet reported relevant data.
Source: Coordinator interviews; March 2006. Prepared by Andrew Epstein.*

**Appendix F
Extramural Research Awards**

Table 1: Cluster Faculty and All Faculty Extramural Research Awards by Year

	<u>Total Awards (millions)</u>		<u>Average Award Total Per All Faculty</u>		<u>Number of Faculty with Awards</u>		<u>Average Award Per Faculty with Awards</u>		<u>Total Number of Faculty</u>	
	<u>Cluster</u>	<u>All Faculty</u>	<u>Cluster</u>	<u>All Faculty</u>	<u>Cluster</u>	<u>All Faculty</u>	<u>Cluster</u>	<u>All Faculty</u>	<u>Cluster</u>	<u>All Faculty</u>
1999-00	\$ 6.3	\$ 322.6	\$313,132	\$151,881	13	1,100	\$481,742	\$293,268	20	2,123
2000-01	8.4	371.5	201,071	170,806	28	1,145	301,606	324,457	42	2,174
2001-02	15.3	415.1	221,617	187,583	42	1,139	364,085	364,462	69	2,213
2002-03	16.7	428.3	191,771	192,492	49	1,184	340,491	361,735	87	2,225
2003-04	24.7	526.8	215,108	235,615	63	1,206	392,658	436,846	115	2,236
2004-05	29.0	566.1	236,356	252,949	71	1,175	409,461	481,835	123	2,238
2005-06	32.2	521.6	251,745	234,956	76	1,192	423,992	437,585	128	2,220

NOTES: Statistics shown in the table represent new awards in that year. Includes both Federal and Non-Federal Extramural Research funds awarded to faculty. Awards exclude WARF funds and awards to deans and directors. Awards are assigned to the Cluster Faculty column if the Principal Investigator on the award was hired under the Cluster Hire Initiative.

SOURCE: Extramural Support Information System and University of Wisconsin Data Digest.

Prepared by: Office of Academic Planning and Analysis

6/24/08

**Appendix F
Extramural Research Awards**

Table 2: Cluster Faculty and All Faculty Extramural Research Awards by Division, 2005-2006

Divisional Committee Affiliation	Total Awards (millions)		Average Award Total Per All Faculty		Number of Faculty with Awards		Total Number of Faculty	
	2005-06 Cluster	2005-06 All Faculty	Cluster	All Faculty	Cluster	All Faculty	Cluster	All Faculty
Biological Sciences	\$14.1	\$237.3	\$470,131	\$338,573	29	521	30	701
Physical Sciences	16.1	212.1	401,864	420,786	31	341	40	504
Arts & Humanities	0.0	2.0	1,980	4,734	3	66	25	423
Social Studies	2.0	70.2	60,466	118,552	13	264	33	592
Total	\$32.2	\$521.6	\$251,745	\$234,956	76	1,192	128	2,220

NOTES: Statistics shown in the table represent new awards in that year. Includes both Federal and Non-Federal Extramural Research funds awarded to faculty. Awards exclude WARF funds and awards to deans and directors. Awards are assigned to the Cluster Faculty column if the Principal Investigator on the award was hired under the Cluster Hire Initiative. Faculty with no current divisional committee affiliation are assigned to the most likely division, based on others in their department.

Prepared by: Office of Academic Planning and Analysis

6/24/08

Appendix G
A Sampling of New Courses/Program Tracks Created by Cluster Faculty

Examples of New Courses Created by Cluster Faculty

Course	Cluster
Agroecology and public policy	Agroecology
Applied algebra	Computational Sciences
Systems research seminar	Genomics
Entrepreneurial finance	INSITE
Entrepreneurial law	INSITE
Women and ethnic American literature	Ethnic Studies
Introduction to literature of Native Americans	Ethnic Studies
Archival research methods	Expressive Culture
MRI and human brain imaging	Functional Brain Imaging
Polymeric Materials	Functional Org. Materials
Materials Chemistry of Polymers	Functional Org. Materials
Biology and genetics of filamentous fungi	Food Safety
Advanced seminar in food toxicology	Food Safety
Comparative microbial genetics	Genomics
Statistical methods for genomics	Genomics
Genomics and proteomics	Genomics
Multinational business finance	Global Governance
Advanced international economics	Global Governance
Political economy of corruption and good governance	International Public Affairs
Globalization, technological change, and regulatory harmony	International Public Affairs
Global environmental governance	Int. Environmental Affairs
Urban and regional planning: Land use, transportation	Land Use
Environment and urban functions, spatial organization, and environmental form	Land Use
Environmental economics	Int. Environmental Affairs
Spatial modeling in resource economics	Land Use
Arabic, Persian, and Turkish languages	Middle Eastern Studies
Statistical methods for biosciences	Molecular Biometry
Introductory applied statistics for life sciences	Molecular Biometry
Nanomechanics	Nanophase Inorganics
Mathematical modeling for political science	Political Economy
Foundations of economic sociology	Political Economy
Economic approaches to human behavior	Political Economy
Topic in symbiosis	Symbiosis
Visual cultures of the internet	Visual Culture
Visual cultures of South Asia	Visual Culture
Mapping, making, and representing colonial spaces	Visual Culture
Cultural arts around the Atlantic Rim: 1800 to the present	Visual Culture
Race in American medicine and public health	Women's Health Research
Introduction to zebrafish biology	Zebrafish Biology

**Examples of New or Revitalized Program Tracks
for Graduate and Undergraduate Students**

Program	Cluster
Master of science professional training program	Agroecology
Undergraduate and master's degrees	Biomedical Engineering
Doctoral Minor	Intl Environmental Affairs
Graduate Certificate	Intl Environmental Affairs
Master's of international public affairs with a new track	International Finance
Ecological land use planning certificate	Land Use
Undergraduate certificate and individual major	Middle Eastern Studies
Undergraduate major	Religious Studies
PhD minor	Science and Technology Studies
Energy and policy analysis program	Energy Sources and Policy
Chicana undergraduate certificate	Ethnic Studies
Legal Studies major and certificate	Law, Society and Justice
Undergraduate degree and doctoral minor	Communication Technology
Doctoral Minor	Cultural Studies in a Global Context

Appendix H
Summary of Instructional Activity of Faculty Cluster Hires

	Fall 99	Spring 2000	Fall 2000	Spring 01	Fall 01	Spring 02	Fall 02	Spring 03	Fall 03	Spring 04	Fall 04	Spring 05	Fall 05	Spring 06	Fall 06
A. Total FTE Faculty Cluster Hires	12.2	19.5	32	37	66.1	68.5	83	87	106.3	108.5	120.5	121.5	124.1	125.1	123.3
Excluding Law, Med & Vet Med	11.5	18.2	28.9	32.6	54.3	56.7	69.5	73.8	90.4	92.2	102.7	103.3	102	104.3	100.1
Instructional FTE only	7.8	11.1	15.2	19.5	26.5	28.3	37.9	42	54.3	54.5	60.2	62.6	58.5	62	57.1
State Instructional FTE only	7.8	9.1	12.2	15.5	20.7	21	24.2	26	30.5	31.7	33.5	35.3	34	36.2	36
B. Number of Sections Taught by Cluster Hires															
Group Instruction	11	16	27	44	67	72	76	96	111	118	126	131	133	119	118
Individual Instruction	2	16	27	54	62	72	95	103	122	133	141	172	164	186	177
C. Number of Sections Taught by Cluster Hires, per Instructional FTE															
Group Instruction	1.4	1.4	1.7	2.2	2.5	2.5	2	2.3	2	2.2	2.1	2.1	2.3	1.9	2.1
Individual Instruction	0.3	1.4	1.8	2.8	2.3	3	2.5	2.5	2.2	2.4	2.3	2.8	2.8	3	3.1
D. Number of Sections Taught per <u>State</u> Instructional FTE Faculty															
Group Cluster Faculty	1.4	1.8	2.2	2.8	3.2	3.4	3.1	3.7	3.6	3.7	3.8	3.7	3.9	3.3	3.3
Total UW-Madison Faculty	2.1		2.2		2.1		2.1		2.1		2.1		2.1		2
Individual Cluster Faculty	0.3	1.8	2.2	3.5	3	4	3.9	4	4	4.2	4.2	4.9	4.8	5.1	4.9
Total UW-Madison Faculty	2.4		2.3		2.3		2.3		2.4		2.3		2.3		2.4

Notes: Based on data as of the 10th day of classes in each term. Zero-enrollment sections are excluded. Course sections with multiple instructors are divided equally between the instructors. Sections in crosslisted courses are counted only once. Group instruction sections include lecture, discussion, laboratory and seminar sections. Individual instruction sections include independent study sections and field sections. Professional schools (Law, Medicine & Public Health, and Veterinary Medicine) are excluded. In Section D of this table, the cluster faculty are compared to the total UW-Madison faculty. The UW-Madison faculty teaching load policy calls for an average of two group instructions sections and two individual instruction sections per FTE faculty per term. The actual averages of UW-Madison faculty for recent fall terms, shown in Section D of this table, were originally published in the UW-Madison Data Digest. For purposes of tabulating this indicator of faculty teaching activity, the FTE used in the denominator are limited to those FTE supported from state funds (funds 101, 104 108, 114, 115, 116,131,177, and 402). Moreover, the FTE are limited to those supported from state funds for the program activity of instruction. FTE supported from funds for other program activities (such as research, academic support, or public service) are excluded.

Academic Planning & Analysis, Office of the Provost, UW-Madison bdb 4/16/2007

Appendix I
Cluster Faculty Hiring, Promotion and Tenture Rates

**Table 1: Faculty Hired through the Cluster Hiring Initiative by Rank at Hire:
1999-00 through 2007-2008**

	Professor	Associate Professor	Assistant Professor	Instructor	Total Faculty	Tenured As % of Total
Total Current Faculty (Oct 2007)	1315	401	481	1	2198	78%
Total UW Faculty Hired 1999-00 through 2007-08						
1999-2000	13	13	108	0	134	19%
2000-2001	22	11	123	0	156	21%
2001-2002	19	18	118	1	156	24%
2002-2003	16	13	94	0	123	24%
2003-2004	7	16	75	1	99	23%
2004-2005	9	7	78	3	97	16%
2005-2006	11	8	85	2	106	18%
2006-2007	15	15	80	3	113	27%
2007-2008 *	5	14	83	1	103	18%
Total	117	115	844	11	1087	21%
Total Cluster Faculty Hired 1999-00 through 2007-08						
1999-2000	5	2	13	0	20	35%
2000-2001	5	5	14	0	24	42%
2001-2002	8	2	19	0	29	34%
2002-2003	3	1	15	0	19	21%
2003-2004	1	6	16	0	23	30%
2004-2005	4	2	11	0	17	35%
2005-2006	2	0	6	0	8	25%
2006-2007	0	1	5	0	6	17%
2007-2008*	0	0	8	0	8	0%
Total	28	19	107	0	154	31%

NOTES: Numbers reported are headcounts, not FTES. Faculty who were hired at one rank and have since been promoted are shown in the rank at the time of hire. In addition to tenured and tenure-track faculty positions, Cluster Hire positions were used to hire visiting faculty, artists-in-residence and fellows who are not counted above. Numbers for 2007-08 are estimates.

SOURCE: Graduate School list of Cluster Hires, IADS appointment information system, 2/2008.
Prepared by: Margaret Harrigan, Office of Academic Planning and Analysis

Appendix I
Cluster Faculty Hiring, Promotion and Resignation Rates

Table 2: Promotion Rates for Total Probationary Faculty and Cluster Probationary Faculty by Year of Hire

Year Hired	Total				Cluster Hires				Year Probationary Period Normally Ends
	Total Probationary Faculty Hired	Promoted to Associate Professor	Total Left Without Promotion	Still Probationary	Probationary Cluster Faculty Hired	Promoted to Associate Professor	Cluster Hires Left Without Promotion	Still Probationary	
1999-2000	108	73	32	3	13	11	2	0	2005-2006
2000-2001	123	76	35	12	14	11	2	1	2006-2007
2001-2002	119	58	21	40	19	4	6	9	2007-2008
2002-2003	93	29	13	51	15	6	0	9	2008-2009
2003-2004	76	6	8	62	16	0	3	13	2009-2010
2004-2005	81	5	9	67	11	1	1	9	2010-2011
2005-2006	87	5	2	80	6	1	0	5	2011-2012
Total	687	252	120	315	88	34	14	46	

Table 3: Resignation Rates for Total Probationary Faculty and Cluster Probationary Faculty by Year of Hire

Year Hired	Total				Cluster Hires				Year Probationary Period Normally Ends
	Total Probationary Faculty Hired	Total Left Without Promotion	Total Left After Promotion	Percent Resigned	Probationary Cluster Faculty Hired	Cluster Hires Left Without Promotion	Cluster Hires Left After Promotion	Percent Resigned	
1999-2000	108	32	4	33%	13	2	1	23%	2005-2006
2000-2001	123	35	4	32%	14	2	2	29%	2006-2007
2001-2002	119	21	6	23%	19	6	2	42%	2007-2008
2002-2003	93	13	3	17%	15	0	1	7%	2008-2009
2003-2004	76	8	0	11%	16	3	0	19%	2009-2010
2004-2005	81	9	1	12%	11	1	0	9%	2010-2011
2005-2006	87	0	0	0%	6	0	0	0%	2011-2012
Total	600	118	18	23%	88	14	6	23%	

NOTES: Includes Probationary faculty only. Individuals may be considered for tenure prior to the end of the probationary period. Year probationary period normally ends assumes no adjustment for time on tenure clock outside UW or for extensions to the tenure clock.

SOURCE: IADS appointment data system, Cluster Hires Web Site, February 2008

Prepared by: Margaret Harrigan, Office of Academic Planning and Analysis

6/24/2008

Appendix I
Cluster Faculty Hiring, Promotion and Resignation Rates

**Table 4: Resignation Rates for Total Tenured Faculty and Cluster Tenured Faculty
by Year of Hire**

Year Hired	Total Tenured Faculty Hired	Total Resigned	Resigned as Percent of Total	Tenured Cluster Faculty		Resigned as Percent of Total
				Hired	Total Resigned	
1999-2000	26	6	23%	7	1	14%
2000-2001	33	4	12%	10	1	10%
2001-2002	37	2	5%	10	0	0%
2002-2003	29	3	10%	4	0	0%
2003-2004	23	2	9%	7	0	0%
2004-2005	16	3	19%	6	1	17%
2005-2006	19	1	5%	2	1	50%
2006-2007	32	1	3%	1	0	0%
Total	215	22	10%	47	4	9%

NOTES: Includes those hired as Associate Professors or Professors only.

SOURCE: IADS appointment data system, Cluster Hires Web Site, February 2008
Prepared by: Margaret Harrigan, Office of Academic Planning and Analysis

6/24/2008

Appendix J

Faculty Hired through the Cluster Hiring Initiative: 1999-00 through 2007-08 by Gender and Race/Ethnicity

Headcount	Gender				Race/Ethnicity					
	Total	Male	Female	Female as % of Total	Black	Asian	Native American	Hispanic	White/Other	Minority as % of Total
Total Faculty Hired										
1999-00	134	91	43	32%	3	14	2	4	111	17%
2000-01	156	99	57	37%	9	28	0	5	114	27%
2001-02	156	109	47	30%	7	29	2	3	115	26%
2002-03	123	80	43	35%	3	18	1	2	99	20%
2003-04	99	54	45	45%	0	14	2	9	74	25%
2004-05	97	63	34	35%	5	13	0	5	74	24%
2005-06	106	63	43	41%	2	12	0	10	82	23%
2006-07	113	68	45	40%	4	18	1	4	86	24%
2007-08*	103	65	38	37%	3	17	1	6	76	26%
Total	1087	692	395	36%	36	163	9	48	831	24%
Faculty Hired through Cluster Hire Initiative										
1999-00	20	15	5	25%	1	0	0	0	19	5%
2000-01	24	18	6	25%	0	6	0	2	16	33%
2001-02	29	21	8	28%	1	10	1	0	17	41%
2002-03	19	11	8	42%	1	4	1	0	13	32%
2003-04	23	11	12	52%	0	4	0	0	19	17%
2004-05	17	13	4	24%	0	2	0	0	15	12%
2005-06	8	5	3	38%	0	2	0	0	6	25%
2006-07	6	6	0	0%	0	1	0	0	5	17%
2007-08*	8	3	5	63%	0	0	1	1	6	25%
Total	154	103	51	33%	3	29	3	3	116	25%

NOTES: 2007-08 data are preliminary. In addition to faculty positions, Cluster Hire funds are used to hire visiting faculty, fellows and artists-in-residence who are not included in the Total Faculty hired through Cluster Hire Initiative numbers above. Individuals who choose not to report race are shown as White/Other.

SOURCE: Graduate School list of Cluster Hires who accepted appointments, Cluster hire web site, and IADS appointment data system as of 2/2008.
Prepared by: Margaret Harrigan, Office of Academic Planning and Analysis 06/24/08

**Appendix K
Spring 2008 Cluster Coordinator Survey Results***

Name of cluster:	Grant funding from a source external to the UW-Madison	Grant funding from the UW-Madison (besides a cluster enhancement grant)	Cluster members prepared a research proposal jointly (whether or not the proposal was funded)	Cluster faculty created new undergraduate or graduate courses	Cluster founded or is in the process of founding new degree programs	Cluster facilitated, independently or with other groups, extracurricular programs on campus	Cluster engaged in outreach activities or public engagement	Cluster faculty obtained a federal patent	Cluster is administered under the auspices of an academic department, center, or program	Cluster has a dedicated physical location
African Diaspora/AtlanticResearch Circle	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes
American Indian Studies	No	No	No	No	Yes	Yes	Yes	No	Yes	No
Bioethics	Yes	Yes		Yes	No	Yes	Yes	No	Yes	No
Biomedical Engineering	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Biophotonics	No	No	No	Yes	No	No	No	Yes	No	No
Chemical Biology	Yes	No	Yes	Yes	Yes		No	Yes	No	No
Chemistry	No	No	No	Yes	No	No	No	Yes	Yes	No
Cognitive Science	No	Yes	Yes	Yes	No	Yes	No	No	No	No
Communication Technologies Research	No	No	Yes	Yes	No	Yes	Yes	No	No	No
Comparative Political Economy	No	No	Yes	Yes	No	Yes	Yes	No	Yes	No
Comparative United States Studies	No	No	No	Yes	No	Yes	Yes	No	Yes	No
Computational Sciences	Yes	No	Yes	Yes	No	No	No	Yes	No	No
Computer Engineering	Yes	No	Yes	Yes	No	No	No	No	Yes	Yes
Computer Sciences	Yes	No	Yes	Yes	No	No	Yes		Yes	Yes
Cultural Studies in Global Context	No	Yes	No	Yes	No	Yes	Yes	No	Yes	No
Energy Sources and Policy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	No
Expressive Culture/Diversity in Upper Midwest	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	No
Functional Organic Materials	Yes	No	Yes	Yes	No	Yes	Yes	Yes	No	No
Genomics	No	No	No	Yes	No	No	No	No	Yes	Yes
Global Governance and International Finance	No	Yes	Yes	Yes	No	No	Yes	No	Yes	No
Initiative for Studies in Entrepreneurship	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes
Intl Environmental Affairs/Global Security	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
International Public Affairs	No	No		Yes	Yes	Yes	Yes	No	Yes	No
Land Use	Yes	Yes	No	Yes	No	No	Yes	No	No	No
Law, Society and Justice	No	Yes	No	Yes	No	Yes	Yes	No	Yes	Yes
Middle Eastern Studies	Yes	No	No	Yes	Yes	Yes	Yes	No	Yes	Yes
Molecular Biometry	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	No
Political Economy	Yes	Yes	No	Yes	No	Yes	Yes	No	No	No
Poverty Studies	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Religious Studies	No	No	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
Science and Technology Studies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
Stem Cells and Regenerative Medicine	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	No
Structural Biology	Yes	No	Yes	Yes	No	No	Yes	Yes	No	No
Symbiosis	No	No	Yes	Yes	No	Yes	Yes	Yes	No	Yes
Visual Culture	No	Yes	No	Yes	Yes	Yes	Yes	No	Yes	Yes
Vitamin D	Yes	No	No	Yes	No	No	No	Yes	Yes	Yes
Women's Health/Biology Gender Differences	Yes		No	Yes	No	No	No		No	No
Zebrafish Biology	No	Yes	Yes	Yes	No	Yes	Yes	No	No	No
Total "yes" *	21	16	23	37	12	26	29	10	25	15
Percent "yes" *	55.2%	42.1%	60.5%	97.3%	31.5%	38.4%	76.3%	26.3%	65.7%	39.5%

* 38 of 49 clusters responded

Clusters not represented: Advanced Materials By Design: Theory and Computation; Agroecology; Computational Systems Biology; Disability Studies; Food Pathogens and Toxins; Functional Brain Imaging; Interdisciplinary Arts Residency Program; Mathematical Physics--String Theory; Nanophase Inorganic Materials and Devices; Translational Research--Neurodegenerative Diseases; Very High Energy Astrophysics and Cosmology