AGENDA
GRADUATE COUNCIL MEETING
Thursday, November 21, 2013
9:10 - 11:00 AM
ACADEMIC SENATE CONFERENCE ROOM
ROOM 220 UNIVERSITY OFFICE BUILDING

Action
9:10 – 9:15
1. Approval of Minutes of October 17, 2013 meeting

Information/Discussion
9:15 – 9:20
2. Announcements
   a. Chair of the Graduate Council
   b. CCGA Representative
9:20 – 9:25
9:25 – 9:30
9:30 – 9:40

Action
9:40 – 9:50
3. Courses and Programs Subcommittee
   A. Approval of Courses:
      1. CEE 249/BIEN 249 - Integration of Computational and Experimental Biology – CHANGE
      2. CS 201 - Compiler Construction – CHANGE
      3. CS 202 - Advanced Operating Systems – CHANGE
      4. CS 204 - Advanced Computer Networks – CHANGE
      5. CS 205 - Artificial Intelligence – CHANGE
      7. CS 207 - Advanced Programming Languages – CHANGE
      8. CS 210 - Scientific Computing – CHANGE
      9. CS 211 - High Performance Computing – CHANGE
     10. CS 215 - Theory of Computation – CHANGE
     11. CS 218 - Design and Analysis of Algorithms – CHANGE
     13. CS 229 - Machine Learning – CHANGE
     15. CS 231 - Computer Animation – CHANGE
     16. CS 234 - Computational Methods for Biomolecular Data – CHANGE
     17. CS 235 - Data Mining Techniques – CHANGE
     18. CS 236 - Database Management Systems – CHANGE
     19. CS 237 - Advanced Topics in Modeling and Simulation – CHANGE
     20. CS 238 - Algorithmic Techniques in Computational Biology – CHANGE
     21. CS 239 - Performance Evaluation of Computer Networks – CHANGE
     22. CS 240 - Network Routing – CHANGE
     23. CS 241 - Advanced Topics in Network Measurements and Security – CHANGE
     24. CS 242 - Information Retrieval and Web Search – CHANGE
     25. CS 245 - Software Evolution – CHANGE
     26. CS 246 - Advanced Verification Techniques in Software Engineering – CHANGE
     27. CS 253 - Distributed Systems – CHANGE
     28. CS 255 - Computer Security – CHANGE
     29. CS 257 - Wireless Networks and Mobile Computing – CHANGE
     30. CS 260 - Seminar in Computer Science – CHANGE

Attached
31. CS 261 - Seminar in Artificial Intelligence and the Design of Expert Systems - CHANGE
32. CS 262 - Algorithms and Data Structures – CHANGE
33. CS 263 - Seminar in Distributed Systems – CHANGE
34. CS 267 - Seminar in Databases – CHANGE
35. CS 269 - Software and Hardware Engineering of Embedded Systems – CHANGE
36. CS 272 - Probabilistic Models for Artificial Intelligence – CHANGE
37. GBST 302 - Teaching Practicum – NEW
38. MSE 246/BIEN 224 - Cellular and Molecular Engineering - CHANGE

Courses previously reviewed & returned for corrections:

1. MCS 302 - Teaching Practicum – NEW – Returned because it had no syllabus.

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<td>B. Bioengineering response to F&amp;R and vote to close-out</td>
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<td>10:40 – 11:00</td>
<td>A. iLearn site Overview</td>
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<td>B. Revised Attendance Policy</td>
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Present:
Lynda Bell, History, Chair
Ertem Tuncel, Electrical Engineering, Vice Chair
Rick Redak, Entomology, Secretary
Wendy Ashmore, Anthropology
Malcolm Baker, Art History
Chris Chase-Dunn, Sociology
John Kim, Comparative Literature & Foreign Languages
David Lo, School of Medicine
Rene Lysloff, Music
Rollanda O’Connor, GSOE
Jing Shi, Physics
Jorge Silva-Risso, SoBA
Jingsong Zhang, Chemistry
Joe Childers, Graduate Dean (ex-officio)
Preston Williams, GSA Representative

Absent:
Daniel Schlenk, Environmental Sciences

Guests:
Linda Scott, Graduate Division

Approval of Minutes
The minutes from the September 26, 2013 meeting were unanimously approved as written.

Chair’s Announcements
Chair Bell informed the committee that Chairs are not supposed to vote on Senate committee business unless it is to break a tie.

Chair Bell introduced Graduate Council’s new GSA representative, Preston Williams, as well as Prof. David Lo from the School of Medicine. Prof. Lo is replacing David Johnson on the committee.

Chair Bell informed the committee that President Napolitano will be visiting UCR in early November but that the date of her visit is being kept confidential due to possible student demonstrations. There has been discussion about an open faculty forum with the President during her campus visit.

Chair Bell indicated that she would like to ask the Deans what they do with the outcomes of the Council’s graduate program reviews.
An iLearn site is being created for Graduate Council so that non-confidential review materials can be shared and easily viewed. The calendar on the iLearn page will be populated with all Graduate Council and Courses & Programs Subcommittee meeting dates, as well as all of the 2013-14 program review dates.

All program review dates are very close to being finalized. The internal review of Ethnic Studies will hopefully be on December 2, 2013. Physics will be reviewed in early April, 2014. Chemistry and Geological Sciences will both be reviewed in May, 2014. Political Science and Philosophy still need to be scheduled.

**Announcements**

*John Kim, CCGA Representative* – Prof. Kim informed the committee that the first CCGA meeting was on October 2nd. It was primarily an introductory meeting. CCGA discussed Governor Brown and the fact that he has been proactive on the Board of Regents; however, not always in the most appropriate way. Governor Brown does not want student tuition to increase. He also feels that faculty salary increases are not enough; however, he does not understand why faculty need sabbatical leave.

Prof. Kim encouraged the Council to review the major changes being made to the health plans. Health Net coverage is being drastically reduced. UC Care is the new plan, making UCR’s primary hospital Parkview which is not desirable.

Senate Bill 520 – this bill mandates UC to accept credit from students for online courses taken anywhere. This item was tabled for later discussion.

Rebenching – the discussion about rebenching focused on out of state students and how the system determines how many out of state students to accept.

Senate bill 195 – this bill mandates that data must be collected with regard to learning outcomes and graduate education. The bill was passed but the requirement that we actually collect the data was not passed.

California Postsecondary Education Commission (CPEC) requirement – CPEC no longer exists. Therefore, the CPEC requirement on proposals has been negated. There is no longer a requirement to justify what kind of jobs our Ph.D. students can get in our proposals for Ph.D. programs.

Items on the CCGA Chair’s agenda for this year are 1) to make a big push in Sacramento for graduate education; and 2) to try to get rid of non-resident tuition (NRT) for international students.

UCOP Vice President of Research and Graduate Studies, Steven Beckwith, had an announcement regarding a basic initiative. He was able to get IBM to sponsor a conference that will encourage UC graduate programs to articulate with industry, in an effort to boost industry’s interest in UC graduate students. He stressed the importance of getting the Humanities Ph.D. students into non-academic fields.
UC HBCU initiative – there were 36 undergraduates that participated in this initiative last year. Six of them went on to graduate programs in the UC system. There is a lot of interest in continuing this program and expanding it to Hispanic students.

Pamela Jennings, UCOP Graduate Studies Director, is spearheading an initiative to create a UC graduate student alumni survey throughout the system.

**Preston Williams, GSA Representative** – Preston Williams discussed union contact negotiations. Unions are not willing to negotiate so UCR’s GSA has joined forces with UCSD in an effort to push unions to negotiate. The issues that GSA has raised are to assure that pay is adjusted with the cost of living, as well as issues related to health benefits and child care benefits. UC has made offers, but the unions are not responding. There seems to be a disconnect between the representatives and the union leadership.

**Graduate Dean Joe Childers** – There is a greater UC presence in Sacramento. In late Winter/early Spring there will be an All-UC Day in which UC representatives will go to Sacramento to lobby. There is also a Graduate Research Day in which each campus’ Graduate Dean goes to Sacramento with select graduate students to talk to our local representatives. The representatives are very interested in talking to students. Dean Childers chooses students to attend this meeting who are diverse and represent our campus well.

Dean Childers just returned from a two day Chancellor’s Retreat. He informed the Council that our new Chancellor understands how Universities really work. He is open, down to earth, and will hold our campus to high standards. He has empowered UCR to look into why things are done certain ways, and if a process is not working, stop doing it. Enrollment management was also discussed at the Retreat. UCR is setting specific enrollment numbers to obtain AAU status. UCR will need to double the current graduate student numbers, setting a goal of 5,000 students (of a 25,000 student population). An additional 1,400 graduate students will need to be admitted each year for the next six years. This year 800 graduate students were brought in, the greatest number UCR has ever brought in. Another consideration is the ratio of Master’s students to Ph.D. students. Currently, 76 percent of UCR graduate students are Ph.D. objective. UCR currently spends $65 million on graduate student support every year (from all sources – Graduate Division fellowships, TAships, state sponsored GSR’s, grants, and gifts); 70 percent of that is UCR money (approximately $50 million). UCR will need to spend $94 million per year on graduate student support. UCR needs to hire faculty who will bring in external funds. Terminal master’s degrees and Professional School master’s degrees and fees will help fund the cost of Ph.D.’s. The Chancellor believes that our campus needs to hire 250 new faculty. This year the campus is doing 80 new faculty searches, 35 in CNAS alone. Our net faculty should be around 30-35. The Chancellor is also interested in being creative with how we leverage our ability to do this – there is a difference between good and bad debt. The pressure is going to be on the Deans to make good teaching hires; the upper Administration to fund the money; and on VC Pazzani (Research) to increase UCR’s extramural funding. VC Pazzani has been asked to triple UCR’s extramural funding.

Dean Childers has a funding idea and will be asking for an increase in his per student average to his budget. UCR needs to increase the number of graduate students, while also maintaining the quality. UCR is relatively competitive within the UC, but not outside UC in terms of stipends.
the past, the Graduate Division has received increases to the per student average but it was to cover the increase in tuition. Dean Childers will be requesting a specific amount of funds to create super-fellowships. Dean Childers is thinking about calling them Provost Research Fellowships since he will be requesting the funds from Provost Rabenstein. These fellowships will be as much as $35k per year for two years. They will be very competitive because there will not be very many awarded. The requirements will be a 3.75 GPA and a GRE score of 315 – 320. These fellowships will be greater than the Chancellor’s Distinguished Scholarships and will require nominations from Graduate Advisors.

Grad Quant is forthcoming and will be housed in the Life Sciences. The center is expected to be up and running in the Winter. It will be a resource center for faculty and graduate students who need help with quantitative analysis and it will help students who need to have their methodology reviewed. Graduate Division will be sending out surveys and would like to know what faculty feel their students need. It will function like UCR’s Writing Center. Students can drop in if they are having difficulty with their methods. This will pull faculty together across the campus that work with quantitative methods to assure there are no redundancies and that needs are being met. Associate Dean Esterling will oversee this center.

Courses and Programs to be approved
Graduate Council voted to approve/return the following courses as indicated:

1. ANTH 281 – Anthropology of Humanitarianism – NEW – approved
2. ART 293 - Directed Individual Studio Production – NEW* - Prof. Lysloff discussed this course and the issues C&P raised. This is a 1-6 unit individual study course, which is why there is no syllabus. A short justification is provided but Graduate Council is not sure that is enough as there seems to be no oversight. Graduate Council voted to table the discussion of this course and program change until the November Council meeting. Council will do some research as more information is needed.
3. BCH 240 - Special Topics in Biochemistry – CHANGE - approved
4. BIEN 223 – Engineering Analysis of Physiological Systems – CHANGE - approved
5. BIEN 223V - Engineering Analysis of Physiological Systems – NEW – Approved with one member opposed
6. BIEN 264 – Biotransport Phenomena – CHANGE - approved
7. BIEN 264V - Biotransport Phenomena - NEW – Approved with one member opposed
8. BMSC 231M - Foundations of Medicine I: Clinical Aspects – DELETE - approved
9. BMSC 232M - Cardiovascular, Renal, and Respiratory Sciences I: Clinical Aspects – DELETE - approved
10. BMSC 233M - Gastrointestinal, Endocrine, and Reproductive Health I: Clinical Aspects – DELETE - approved
11. BMSC 234M - Musculoskeletal Medicine: Clinical Aspects – DELETE - approved
12. BMSC 235M - Clinical Neurosciences I: Clinical Aspects – DELETE - approved
13. BMSC 236M - Foundations of Medicine II: Clinical Aspects – DELETE - approved
14. BMSC 237 - Gastrointestinal, Endocrine, and Reproductive Health II – DELETE - approved
15. BMSC 238 - Clinical Neurosciences II – DELETE - approved
16. BMSC 239 - Cardiovascular, Renal, and Respiratory Sciences II – DELETE - approved
17. BMSC 240 - Integrative Human Biology and Disease – DELETE - approved
18. CWPA 268 – Writing the Half-Hour Television Comedy – NEW - approved
19. EDUC 240 – Educational Psychology – CHANGE - approved
20. EDUC 246 (E-Z) – Research on Education of Exceptional Children – CHANGE - approved
21. EDUC 259 – Research Seminar – CHANGE - approved
22. EDUC 262 – Achievement Motivation – CHANGE - approved
23. EDUC 282A – Curriculum Theory and Instructional Processes: Mathematics and Science – CHANGE - approved
25. EDUC 285 (E-Z) - Curriculum Theory and Instructional Processes – CHANGE - approved
26. EDUC 335A - Supervised Teaching in Special Education – CHANGE - approved
27. EDUC 336B - Supervised Teaching in the Elementary School – CHANGE - approved
28. EDUC 338A - Intern Teaching in the Elementary School – CHANGE - approved
29. EDUC 344B - Multiple Subjects Credential Seminar – CHANGE - approved
30. EDUC 348A - Single Subject Credential Seminar – CHANGE - approved
31. EDUC 376A - Supervised Teaching in the Secondary School – CHANGE - approved
32. EDUC 378A - Intern Teaching in the Secondary School – CHANGE - approved
33. ENGR 200 - Engineering in the Global Environment – CHANGE - approved
34. ENGR 200V - Engineering in the Global Environment - NEW – Approved with one member opposed
35. ENGR 201 - Technology Innovation and Strategy for Engineers – CHANGE - approved
36. ENGR 201V - Technology Innovation and Strategy for Engineers - NEW – Approved with one member opposed
37. ENGR 202 - Introduction to Systems Engineering – CHANGE - approved
38. ENGR 202V - Introduction to Systems Engineering - NEW – Approved with one member opposed
39. ENGR 203 - Principles of Engineering Management – CHANGE - approved
40. ENGR 203V - Principles of Engineering Management - NEW – Approved with one member opposed
41. ENSC 206/POSC 206 - Environmental Policy and Law – CHANGE - approved
42. ETST 204 - Critical Race Perspectives in Latino Education – NEW - approved
43. MATH 302 - Apprentice Teaching and Professional Development – CHANGE* - Graduate Council voted to table the discussion of this course and program change until the November Council meeting. The Professional Development course proposed covers TA’s and does not work for Professional Development.
44. RLST 403 - Directed Professional Development – NEW* - Graduate Council voted to table the discussion of this course and program change until the November Council meeting.
45. SOC 258 - Current Research in the Sociology of Families and Loving Relationships – DELETE - approved
46. SOC 260 - Research Practicum on the Evolution of Settlements and Polities – NEW - approved
47. SOC 284 – Sociology of the Family – DELETE - approved
48. SOC 285 (E-Z) – Topics in Social Psychology – CHANGE - approved

*Course is related to a new program or program change on the agenda.

“V” Course discussion - Graduate Council discussed the distance proctoring problem – how will the instructor know the student testing is the student enrolled in the course? How will the instructor know the student is not using notes on their exam? The program changed the exam guidelines as recommended by C&P for all of the “V” courses. Graduate Council indicated that by having a separate “V” designation, it is implied that there is a two tiered system. Dean Childers mentioned that UCSD has a Masters of Advanced Studies and that it may be a good idea if this online program was named something different, with a different kind of expectations than the in-class program. Graduate Council voted to approve the “V” courses with one member opposed.
After the meeting, Prof. Chase-Dunn reviewed the following four “V” courses that were resubmitted for the same types of changes C&P requested for the other “V” courses on the agenda – BIEN 224, BIEN 224V, BIEN 249, and BIEN 249V. Prof. Chase-Dunn made a motion via email to approve the entire list of “V” courses, and Chair Bell seconded that motion. The Graduate Council voted via email to approve the four courses.

Graduate Council voted to approve/return the following new programs as indicated:

1. Designated Emphasis in Latin American Studies – *unanimously approved*
2. Masters of Public Policy – *unanimously approved*

Graduate Council voted to approve/return the following program changes as indicated:

1. English – Abolishing Terminal M.A. Program – *unanimously approved*
2. Computer Science – Catalog Updates for 2013-14 – *unanimously approved*
3. Economics Program Change request – *unanimously approved*
4. MFA in Visual Art – change in unit and course requirements – See course ART 293 in CRAMS on agenda – Graduate Council voted to table the discussion of this course and program change until the November Council meeting. Council will do some research as more information is needed.
5. Proposed changes to Religious Studies graduate program – addition of Professional Development – see course RLST 403 in CRAMS on agenda - Graduate Council voted to table the discussion of this course and program change until the November Council meeting.
6. Change Mathematics Masters and Doctoral degree requirements to include Professional Development training – see course MATH 302 in CRAMS on agenda - Graduate Council voted to table the discussion of this course and program change until the November Council meeting. The Professional Development course proposed covers TA’s and does not work for Professional Development.

**Revised Attendance Policy**
Due to time constraints, this item was tabled for discussion at the November Council meeting.

**Graduate Program Reviews**

*Sociology* –
Lynda Bell informed the Council that Prof. Wendy Ashmore will be communicating with Sociology and will act as the liaison between the program and the Graduate Council.

*Plant Biology response to F&R* –
Prof. Rick Redak presented Plant Biology’s response to the Graduate Council’s Findings and Recommendations (F&R). According to the student questionnaires, an unknown fraction of students felt disenfranchised from the program. The program was very surprised by this and
responded with all the things they have been doing, including a plan for handling diversity. Chair Bell suggested that Graduate Council discuss the common CNAS issues with CNAS Dean Yates. Chair Bell offered to write a close-out memo that elaborates on the issues, and suggests a meeting with the Dean. Graduate Council voted unanimously to close-out the review pending review and approval of Chair Bell’s close-out memo.

*Biomedical Sciences response to F&R –*
Due to time constraints, this item was tabled for discussion at the November Council meeting.
The UCR Biomedical Sciences (BMS) Program is an umbrella graduate program for the School of Medicine with program faculty having primary appointments in the Division of Biomedical Sciences or in multiple other academic campus units. The current goal of the program is to train PhD candidates to conduct research addressing questions related to human diseases. To achieve this goal the Program emphasizes course work in years 1 and 2 designed for obtaining a comprehensive understanding of human physiology and human disease pathophysiology, and thesis research beginning in year 2 that bridges basic science investigation and clinical medicine.

**Strengths**

**Program and Curriculum**

The goal of the BMS Program to train students for investigative research in areas related to human diseases is important and has high significance, impact, and funding potential. The BMS Program provides this distinct niche at UCR and complements other UCR programs having a primary focus on basic science research, such as Cellular, Molecular and Developmental Biology (CMDB), Biochemistry and Molecular Biology (BMB), and Genomics and Genetics Biology (GGB). The distinct focus on human diseases is the predominant reason current BMS students chose to come to UCR. Additionally, BMS students conveyed a strong belief that the Program is preparing them for future competitive academic and industry investigative research.

Since the previous external review in 2002, the BMS Program initiated a revised curriculum that is extensive and challenging but stronger for preparing students in translational research. BMSC230, a didactic series of lecture courses taken with first year medical students at UCR and taught by many BMS core faculty, provides an excellent foundation in human physiology, and a unique opportunity for PhD and MD students to interact and share ideas and perspectives. Students in the BMS Program indicated that taking BMSC230 and having cross-pollinating interactions with medical students was a distinct strength. BMSC260 Topics in Biomedical Research, a series of problem-based learning modules developed for PhD students, offers strong investigative and independent thinking components of training by exploring current literature, questions, and experimental models of human pathophysiology. Disease topics chosen by faculty, including cancer, cystic fibrosis, metabolic diabetes, TB, atherosclerosis, and Alzheimer’s disease, have broad significance and also relevance to the research programs of BMS faculty. As noted below, however, a current challenge is to ensure excellence and continuity between sessions in response to students’ concerns that only ~ half of the sessions are strong and effective. Another notable strength of the revised curriculum is BMSC254, a weekly forum for students to present work in progress, that importantly is attended by a substantial number of faculty.

The BMS Program has improved resources, although as described below securing additional necessary resources is a current need. Improved resources include designated administrative support, funds for recruiting 4-5 new faculty and a new building that will house state-of-the-art laboratories for new recruits. Recently established funds for PIC (Program for Innovative Collaborative Research) intramural grants provide an important resource for establishing
collaborative research; however, whether these efforts translate to increased extramural funding remains unclear.

Faculty
BMS core and joint faculty share a strong collective vision about the direction of the program in filling a much-needed investigative focus at UCR in human diseases. Documents and interviews confirmed faculty are enthusiastic, energetic, and committed toward maintaining a high standard in training future investigators in translational research. Faculty with primary appointments in the BMS Division retain a good democratic voice in the direction and quality of the Program. There appears to be a refreshing lack of divisiveness between faculty in the Division, although some joint faculty in the Program expressed a preference for more input and transparency with changes and goals. Teaching quality is high. Also, a distinct strength is a commitment toward providing students with high quality and engaged graduate advising, and the efforts of Monica Carson and Iryna Ethell toward achieving this goal are commendable.

The breadth and scope of research in BMS-affiliated laboratories is generally sufficient for the objectives and size of the program, although a noted challenge described below is the students’ preference for an increased number of PI’s doing translational research. The BMS program research strengths include neuroscience, immunology, cardiology, and infectious diseases. A research focus group on "neuron-glia interactions" integrates several BMS faculty including Drs Carson, Lo, Ethell, Binder, Wilson and several faculty from CMBD and BMB. The goal is to generate program and training grants. This group meets regularly and has been successful in engaging young faculty such as Dr Emma Wilson who attributes this interaction as a major influence in obtaining NIH grant support.

The current recruitment effort to hire 4 new faculty in the Division will increase the strength of the BMS Program. New faculty hires with distinct translational research programs will provide students with more choices for research laboratories and research projects, and should benefit current faculty through collaborations and translational expertise. Recruiting several new faculty having research programs within current thematic strengths such as inflammation, neural/glia interactions, or microbial pathogenesis is important for increasing the depth of the BMS Program and for collaborations that could equate to extramural funding for the program and for independent investigators. It is critical for the Division to successfully recruit four new faculty with demonstrated success in obtaining research funding and with leadership consistent with increasing future research funding at UCR. In addition, it is critical for the Division to continue to pressure the campus and UC leadership for replacement, with start-up funds, of faculty FTEs scheduled for retirement in the next few years, possibly 4-5, two already announced (Strauss, Johnson). Equally important will be early recruitment of suitable academic clinical faculty.

An important aspect of this external review was to evaluate levels of external funding for each faculty member. Based upon the information provided, it was difficult to determine current funding levels of BMS faculty. It would have been helpful if current and past external support was provided in the NIH grant format. This should be easily accessible and could be added to the brief CV provided for each faculty member. The reviewers did obtain a somewhat satisfactory list of this funding after the visit.

Students
The number of students is appropriate based on currently available training opportunities and resources. The quality of students is improved since the last Program review in 2002. Although our review committee was unable to evaluate the caliber of the BMS student applicant pool, there are an increased number of domestic students accepted who have undergraduate
degrees from highly regarded institutions. Some but not all faculty with students in other UCR graduate programs believe BMS students are of comparable strength. The previously high attrition rate of nearly 50% appears to currently be lower, although this was difficult to establish because although documentation indicated a near 50% attrition, interviews with faculty and Program leadership indicated a lower rate. Time to completion of PhD degree is within the national average. Documentation on matriculated students was not clearly available to the reviewers to evaluate the placement and successes of program graduates.

Current students are largely enthusiastic about the Program. They believe they have strong and valuable interactions with faculty and a reasonably active voice in the Program. Students also expressed that their interactions with medical students in courses and study groups during their first year provides different and valuable insights.

**Challenges**

**Program and Curriculum**

A major challenge is maintaining a PhD program focused on human diseases at an institution without clinician scientists. The recent appointment of Devin Binder, Assistant Professor In Residence, who has a strong and well-funded research program investigating cellular mechanisms related to traumatic brain injuries, is an important first step in meeting this challenge. The anticipated accreditation of a UCR four year MD degree program with a projected entering class beginning Fall 2013 should also strengthen the BMS Program, although it remains unclear how the anticipated MD program will impact the PhD program. An articulated vision appears to be highly focused on an MD/PhD program but lacking a strategic plan for how the BMS PhD program will be improved. Additionally, it is uncertain whether an initial reliance on community physicians in local hospitals for clinical training in an MD program will enhance research at UCR. Although most faculty in the biological sciences are highly supportive of an accredited MD program and believe it is imperative for the growth of UCR, more attention is needed for the academic side of this venture. Another challenge with the anticipated accreditation of an MD program is ensuring transparent and effective communication between leadership and faculty in the biological sciences regarding plans, allocations of resources and impact on existing PhD programs.

Although the BMS Program has a goal to train students for investigative research in areas related to human diseases, a clear strategic plan and designated leadership are lacking. Faculty with primary appointments in the Division of Biomedical Sciences expressed a preference for retaining their current “democratic consensus” for decision-making but clearer leadership is needed to speak for the needs of the Program.

The relatively small numbers of students in the Program makes it imperative to currently focus on strengthening depth at the expense of breadth and to retain focus on a limited number of areas with in-house expertise, such as inflammation, neural/glia interactions, and microbial pathogenesis. A broader scope of research areas is a feasible way to develop and expand the program in the future but considering the current size of the BMS Program and resources, strength will be most enhanced with a more limited focus.

A challenge of the current curriculum is maintaining comprehensive training in human physiology and diseases while preserving adequate time for investigative research. The heavy didactic coursework limits effective research rotations during year 1. The current curriculum designating a limited 5-week period – and more importantly limited research time during each 5-week period – is not sufficient for students to manage a reasonable rotation project or for faculty
to evaluate student performance. This is a particular concern of faculty who do not directly teach in first year courses and hence do not have routine interactions with students to evaluate their strengths and limitations. Referring to rotations as a techniques course diminishes the importance in training a student to think conceptually about scientific problems. Another challenge of the current curriculum is to ensure excellence and continuity between sessions in BMSC260, which students believe should be improved.

Increasing funding and research facilities for the BMS Program are critical to maintain strength and improve excellence in training students. Achieving funding to support students for their first two years in the Program is important and efforts should be increased to secure a training grant, more student fellowships and/or funded TA positions. A stated goal of the BMS Program is “to develop the teaching potential of each student” but this is not currently being met. Student responses to a questionnaire indicate a majority believes stipends and opportunities to TA are inadequate and available research facilities and equipment should be improved. We recommend that four TA positions be created for second year BMS PhD students. Funding might come from the Medical School budget. These positions should be contingent upon development of a tutorial program for year one medical and graduate students. This will meet the stated need for teaching experience for the BMS graduate students and provide a secured second year for the students. This should remove some of the financial burden of the BMS faculty and open up more laboratories for graduate students.

Faculty
A challenging responsibility of faculty is to enhance excellence of the research climate. Current research in the Program is strong; however ensuring that a substantial number of faculty have research projects addressing questions directly focused on human diseases is important for meeting the goals of the Program. The limited number of postdoctoral fellows in Program-affiliated laboratories is a concern. Few BMS students are doing their thesis work in laboratories that have postdoctoral fellows. Interacting with and learning from postdoctoral fellows is a highly beneficial aspect of graduate student training and increases the Intellectual climate. Also important for a strong research climate is an organized seminar series that brings in outside investigators to present their research and to meet with graduate students.

Maintaining extramural funding by Principal Investigators is critical for strengthening the BMS Program. While the review committee acknowledges the current funding crisis in biomedical sciences research, the proportion of BMS faculty without extramural funding is larger than other PhD programs within and outside of UCR. Additionally, BMS students expressed disappointment – and loss of confidence - in coming to UCR and rotating in laboratories only to subsequently learn that funding for stipend support or a research project was not available.

BMS would benefit from formal mentoring programs for students and junior faculty. Current student mentoring is active but appears to be largely informal and supplemented by a Women in Science forum, which is not utilized by all students. Although mentoring of new faculty is apparently happening, a formal mentoring program for junior and new faculty is not.

BMS should also establish a formal internal review program for NIH grants. While especially beneficial for new or junior faculty, this will benefit all faculty regardless of career stage. The review committee should include three senior faculty with at least one with NIH study section experience and another with little experience in the research focus. This will require that grants be finished 30 days prior to submission, so they can be reviewed and modified. A reward mechanism could be established to encourage participation. In today’s atmosphere of low NIH funding, it is beneficial to receive major criticisms prior to official submission.
UCR BMS Graduate Program Review
March 2012

Students
Efforts should be directed toward increasing the quality and size of the applicant pool and enhancing diversity.

Recommendations
1. Efforts to increase visibility of the Program and its distinct excellence should be a high priority. Outreach initiatives, including recruiting visits to undergraduate institutions, booths at scientific meetings, and contacts with Directors of undergraduate programs in biomedical sciences in State and private Universities in California. With the State of California and local UC and government interest in development, and providing resources for, recruitment of faculty, medical students, and PhD students of Mexican-American heritage, this avenue should be vigorously pursued.

2. Leadership of the BMS Program should be clearly designated and embrace a vision for maintaining program goals and excellence, Additionally, it is important to provide leadership with adequate decision-making responsibilities and administrative support. The four to five new faculty slots provides an opportunity to recruit a top level researcher with the attraction of using 2-3 of these slots for development of their program. This was tried in 2010 and was not successful, partially due to the failure of accreditation of the 4 year medical school. If the accreditation succeeds this year, this plan should be revisited with the goal of attracting an individual with leadership qualities that include current major funding and program development. The inclusion of two or three recruitments could be a sufficient incentive to attract a top candidate. Despite the apparent availability of extremely qualified candidates for junior faculty positions, it would be unwise to fill the slots with four Assistant Professors in four areas of research.

3. A commitment toward enhancing the BMS PhD program within plans for an anticipated accredited MD program at UCR should be a distinct and articulated goal. Plans and resource allocations should be effectively communicated to all faculty in the graduate program.

4. The number of required rotations in the first year should be reduced from four to three to allow more time spent on each rotation. Each rotation should be 8-10 weeks duration and several days of 5+ hours of block time per week should be ensured. This could be achieved by revising the schedule of lectures in BMSC 230 to consolidate times of lectures to mornings or afternoons several days a week.

5. Acquiring increased funding for the Program and for students should be a high priority to enhance excellence and student training. Student stipends for the first two years should be a goal. This should be initiated by funding four TA’s for second year students with the obligation of teaching/leading tutorials for medical and graduate students in year one courses. These TA’s can be eventually replaced/increased by obtaining a training grant focused on one of the existing fields of expertise in the Program (glial-neuronal interactions, microbial pathogenesis/infectious diseases) or a training grant application by the CGNI group with funded slots shared by students within the BMS and Neuroscience graduate programs. Increasing opportunities (preferably funded) for TAships is important to achieve the goal of training students for academic careers. The anticipated MD program offers an excellent opportunity and possibly financial resource for second year BMS students to TA in BMSC 230. Additionally, requiring students to submit fellowship applications during years 1 and 2 might be considered. In addition to possibly acquiring additional support, it would give students training in thinking about current questions in their field of interest and in grant writing.
6. With funding considerations and the limited number of students, the BMS Program should build on current thematic strengths (inflammation, neural/glia interactions and neuroscience, microbial pathogenesis) before expanding research scope. New faculty recruits should have research programs that enhance these thematic strengths and at least one – preferably two – of the four anticipated new hires should be mid-career or higher. New hires should also be made with the goal of providing student training in translational research or a mechanistic understanding of biological processes related to human diseases. The search and recruitment process for new faculty should include members of the BMS program with primary appointments in other departments and be coordinated with faculty in other graduate programs at UCR. Additionally, establishing an organized mentoring program for junior and new faculty is highly advised.

7. Continued effort toward increasing the intellectual climate will enhance the excellence of the Program and students’ training experiences. Most notable are maintaining a seminar series for outside speakers, fulfilling a need for more postdoctoral fellows, and successfully recruiting new faculty who will provide initially further strength to current thematic areas and eventually additional scope in translational research.
Biomedicine Findings and Recommendations

Introduction
The Biomedical Sciences Graduate program was reviewed March 11-12th, 2012 by an external review team comprised of Diane Barber (UCSF), Richard Olsen (UCLA), and Bruce Trapp (Cleveland Clinic). The external report was received April 4, 2012, and passed on to the program. Graduate Council received the program’s corrections June 5, 2012. The last review of the program was in 2002.

The Biomedical Sciences Graduate program is a cross-college program that attracts faculty and students interested in interdisciplinary approaches to solving problems related to human disease. The translational focus of the program and exposure of the graduate students to medical school curriculum provides a clear niche for the program both on campus and nationally. At the time of the review, there were a total of 17 graduate students and 41 faculty associated with the Biomedical Sciences Graduate program. Approximately one-third (14) of the faculty are in the Division of Biomedical Sciences, and the 27 cooperating faculty are primarily from the College of Natural and Agricultural Sciences, with a few faculty from the College of Engineering and College of Humanities, Arts, and Social Sciences.

The external review team viewed the program as having numerous strengths in its research focus and curriculum. The more translational bent to the research of the faculty in the program was seen as complimentary to the graduate programs with more of a focus on basic research. The opportunity for the graduate students to take the medical school curriculum helps to provide training that prepares the students well for more clinically oriented research. The students seem to value their interactions with the program faculty as well as with the medical students. The director and faculty graduate advisors were found to deliver excellent student advising, and leadership for the program.

As discussed by the external review team, the program does face a number of challenges, and will need to be able to grow in unison with the new School of Medicine. For example, while a goal of the program is to train graduate students on research in areas related to human disease, the number of faculty in the program with funded research projects that relate directly to human disease is limited. In addition, the lack of a strong post-doctoral training program impedes the intellectual and research environment for graduate students. The program needs clear leadership and a well-developed strategic plan that maps the future of the Ph.D. program. The external reviewers provide a thoughtful analysis of these challenges, and present ideas to the program for ways to move forward. This is an opportune time for the program to plan and implement future growth, while raising its profile.

Findings and Recommendations

1) Develop a strategic plan for the future of the Ph.D. graduate program, providing a vision for how the graduate program will integrate with the new Medical School. Included in this future plan should be discussion on how to integrate the clinical faculty in the Ph.D. training, targeted areas for future hires, and discussion of whether a new M.D./Ph.D. program is planned.
2) Consider ways to provide stipends for students from the program for a two-year period instead of one year. As part of this, a training grant submission should be a priority. One suggested idea was to create teaching opportunities for the graduate students in the medical curriculum, by funding TA positions. This would have the additional benefit of creating more opportunities for students to participate in teaching. A second idea was to more formally encourage students to apply for fellowships in their first year. More predictable funding for first year students would be beneficial for the program as well.

3) Address the conflict between the course and rotation schedules for first year students. The students need to be able to do meaningful rotation periods with each prospective lab group. The current schedule leaves inadequate time for proper student training and evaluation.

4) Present strategies for improving external grant funding for faculty. One suggested idea was a mentoring program for grant writing. Other ideas were to bring in faculty to give increased depth in certain areas to enhance synergies among faculty in the program.

5) Provide a plan for stronger recruiting and outreach efforts. The program needs to take multiple approaches to increasing its visibility.

6) Consider ways to bring more postdoctoral research fellows to the labs of faculty in the program. This could benefit the program in multiple ways, including increasing the intellectual level, training environment, and excellence of the program.
July 8, 2013

Dear Graduate Council,

We thank-you for your report and we concur with the general overview and suggestions. Please find below a point-by-point response of the program to the specific suggestions/comments provided in the council report.

At this time, I also take the time to update council on the incoming program leadership (always found posted online: http://medschool.ucr.edu/graduate/contact.html). The director appointments are awaiting Provost approval. All other positions have been approved and confirmed.

  Director: Dr. Iryna M. Ethell, Co-director, Dr. David D. Lo
  Graduate Advisor for admission and recruitment: Dr. Ilhem Messaoudi
  Graduate Advisor for enrolled students: Dr. Emma Wilson
  BMSC Graduate Student Peer Mentor: Mr. Danh Do
  BMSC AAO: Mr. Alex Chan

Please feel free to contact me if additional information or clarification is required. However, assuming the Provost approves the recommended director appointments, Dr. Ethell will be the primary contact for the program as soon as her appointment is confirmed. Again, we thank graduate council and the external reviewers for their careful review and critique of our graduate program.

Sincerely,

Monica J Carson, PhD
Graduate Council Report and Program Response (report in blue, program response in black):

Biomedicine Findings and Recommendations

Introduction
The Biomedical Sciences Graduate program was reviewed March 11-12th, 2012 by an external review team comprised of Diane Barber (UCSF), Richard Olsen (UCLA), and Bruce Trapp (Cleveland Clinic). The external report was received April 4, 2012, and passed on to the program. Graduate Council received the program’s corrections June 5, 2012. The last review of the program was in 2002. We note that the graduate program structure and curriculum was completely transformed (via UCR Graduate Council approval mechanisms) in 2007. Thus the current BMSC graduate program curriculum and organization was in force for just under 6 years at the time of external review.

The Biomedical Sciences Graduate program is a cross-college program that attracts faculty and students interested in interdisciplinary approaches to solving problems related to human disease. The translational focus of the program and exposure of the graduate students to medical school curriculum provides a clear niche for the program both on campus and nationally. At the time of the review, there were a total of 17 graduate students and 41 faculty associated with the Biomedical Sciences Graduate program. Approximately one-third (14) of the faculty are in the Division of Biomedical Sciences, and the 27 cooperating faculty are primarily from the College of Natural and Agricultural Sciences, with a few faculty from the College of Engineering and College of Humanities, Arts, and Social Sciences.

We corrected a minor error in the council report in that there is no separate classification of cooperating faculty in the BMSC graduate program. As an interdisciplinary program, all participating faculty participate fully and equally in the program regardless of the college/school of their primary appointment. All “in person” votes and discussion of program issues occur during “biomed Pizza Fridays” with the schedule posted on the program website and emailed to all program members. Online or email votes or discussions are addressed to all participating faculty.

The external review team viewed the program as having numerous strengths in its research focus and curriculum. The more translational bent to the research of the faculty in the program was seen as complimentary to the graduate programs with more of a focus on basic research. The opportunity for the graduate students to take the medical school curriculum helps to provide training that prepares the students well for more clinically oriented research. The students seem to value their interactions with the program faculty as well as with the medical students. The director and faculty graduate advisors were found to deliver excellent student advising, and leadership for the program.

We are highly appreciative and value the active participation of all associated with our graduate program. We are proud that the outstanding efforts and achievements of our faculty and our graduate students were recognized by the external reviewers.

As discussed by the external review team, the program does face a number of challenges, and will need to be able to grow in unison with the new School of Medicine. For example, while a goal of the program is to train graduate students on research in areas related to human disease, the number of faculty in the program with funded research projects that relate directly to human disease is limited. In addition, the lack of a strong post-doctoral training program impedes the intellectual and research environment for graduate students. The program needs clear leadership and a well-developed strategic plan that maps the future of the Ph.D. program. The external reviewers provide a thoughtful analysis of these challenges, and present ideas to the program for ways to move forward. This is an opportune time for the program to plan and implement future growth, while raising its profile.

We agree that the future development and growth of the program needs to be actively planned and implemented with the evolution of the UCR’s SOM as well as with many other new UCR opportunities such as the 2014 launch of UCR’s School of Public Policy, School of Global Health and the 2014 launch of OneHealth Program jointly run between UCR and UC Davis. The outgoing and incoming program directors and advisors have been and will continue to meet with the leadership of SOM and UCR’s emerging new schools. As they develop, potential new initiatives and curricular opportunities will be brought to the “Biomed Pizza Fridays” for program discussion with Program Faculty and Students.

Findings and Recommendations
1) Develop a strategic plan for the future of the Ph.D. graduate program, providing a vision for how the
The program could not agree more with this recommendation. The outgoing and incoming graduate advisors and directors have been and will continue to be in active discussions with the School of Medicine’s Senior Associate Dean for Education, Dr. Paul Lyons, as well as with the Interim Senior Associate Dean of Research. We will ask that the BMSC Graduate Program leadership report these efforts at least annually to the program in the Biomed Pizza Friday venue. BMSC Graduate Program leadership is also in preliminary discussions with Dr. Anil Deolalikar to seek if there are joint curricular opportunities for the BMSC graduate program and UCR’s emerging school’s of public policy and global health.

We do note that the BMSC program does have a MD/PhD program, but it lacks a dedicated fellowship program. Therefore, we believe that the external reviewer’s discussion of a planned MD/PHD program may be referring to our lack of a funded fellowship program for the MD/PhD such as a NIH funded MSTP program. As we grow our base of NIH funding among our BMSC graduate faculty and establish a fully independent and fully accredited UCR SOM, we hope to successfully develop and compete for such training grants.

Targeted hires are outside the purview of an UCR graduate program. However, the BMSC graduate faculty participate in many faculty search committees in multiple UCR colleges and schools. In these roles, the graduate faculty have been instrumental in identifying new faculty and new synergies for the program, with 5 new NIH funded faculty with clear translational research foci being added to the graduate program in this last year. In this manner, we hope that the BMSC graduate program will continue to develop and serve as an unifying and synergizing bridge between participating faculty in all UCR colleges and professional schools.

2) Consider ways to provide stipends for students from the program for a two-year period instead of one year. As part of this, a training grant submission should to be a priority. One suggested idea was to create teaching opportunities for the graduate students in the medical curriculum, by funding TA positions. This would have the additional benefit of creating more opportunities for students to participate in teaching.

The program completely agrees that two year funding for graduate students would be ideal. However, neither UCR’s graduate division nor SOM and the other participating colleges have funds to devote to this goal. Therefore, the program agreed that a training grant submission is a priority. In order to gather sufficient NIH funded investigators required for a T32 grant, Dr. Ethell and Dr. Chen are currently preparing a joint NIH T32 training grant submission between BMSC and GGB for the September 2013 NIH deadline. BMSC graduate program and SOM leadership are seeking similar collaborative opportunities with other UCR programs.

We are happy to report that a three year effort to generate a SOM-based TA-ship has finally come to fruition. Beginning August 2013, the SOM is offering two TA-ship positions for the entire academic year. In future years, the goal will be to break up these two positions into 6 quarter positions.

A second idea was to more formally encourage students to apply for fellowships in their first year. The program could not agree more with this suggestion. We have noted the high success rate of Dr. Rodgers in Bioengineering and the BCOE in mentoring students in generating, submitting and obtaining NSF fellowships. Program leadership has begun discussions with Dr. Rodgers and will be bringing new ideas to the Biomed Pizza Friday for discussion by Program participants on how to replicate similar mentoring programs for the BMSC graduate students.

More predictable funding for first year students would be beneficial for the program as well. We are unsure of the meaning of this comment. The program has never had a deficit in funding first year graduate students; UCR’s Graduate division has provided the program with the standard array of first year UCR graduate fellowships. The SOM has also made clear funding commitments to the BMSC graduate program so that the program can provide additional funding (stipend, tuition and fees) for the
special summer session required for our program. Please note that the first year BMSC graduate program begins on the same schedule as the medical school curriculum in August.

3) Address the conflict between the course and rotation schedules for first year students. The students need to be able to do meaningful rotation periods with each prospective lab group. The current schedule leaves inadequate time for proper student training and evaluation.

This has been a real and acknowledged issue since the new curriculum was conceived. Ideally, the program would like to have sufficient funds to support student stipends for summer rotations between the first and second year of the graduate program. This is as yet an unrealized goal. Applications for training grants are one method that the program is attempting in order to solve this issue.

However, the program did institute one new change this last year in an attempt to address this issue immediately after being raised by the external reviewers. The program now allows first year students to extend their research rotations for a full quarter so that they may have extra time to interact meaningfully with potential dissertation advisors. In the 2012/2013 academic year all four of the first year graduate students were able to successfully identify their major professor by the end of the winter quarter.

4) Present strategies for improving external grant funding for faculty. One suggested idea was a mentoring program for grant writing. Other ideas were to bring in faculty to give increased depth in certain areas to enhance synergies among faculty in the program.

The program could not agree more with these suggestions. Many of BMSC graduate faculty currently do participate in mentored grant writing programs within their primary departments or as part of other center associations. Although UCR graduate programs do not have hiring authority, the program continues to seek to attract UCR faculty with synergistic research foci to the program. In addition, the program agrees that it should also provide venues for multi-PI or program project grant applications amongst the participating BMSC graduate faculty. This issue will be raised and discussed with the program faculty in the next academic year.

5) Provide a plan for stronger recruiting and outreach efforts. The program needs to take multiple approaches to increasing its visibility.

We are happy that to date, we have successfully recruited 4-5 domestic students each year. However, our pool of applications has been relatively small presumably due to low visibility of the program. Recruiting and outreach is a general challenge for many UCR graduate programs including BMSC. We do not have easy answers nor did the external reviewers or graduate council provide specific suggestions on increasing program visibility.

Our program remains devoted to the service and diversity mission of the SOM. As in past years, at least one of the graduate advisors will be attending SACNAS to advertise our program to this audience. We will also continue with our current outreach efforts to the regional California State Universities. We will continue to bring this high priority issue to our participating faculty and students for discussion and brainstorming.

We also feel that the level of financial support offered as stipend may be a negative factor in recruiting top students to our program. Therefore, we are seeking to get consensus on increasing the GSR step level of support for BMSC graduate students (currently amongst the lowest on campus).

6) Consider ways to bring more postdoctoral research fellows to the labs of faculty in the program. This could benefit the program in multiple ways, including increasing the intellectual level, training environment, and excellence of the program.

All but one of the SOM labs with BMSC graduate students have one or more post-doctoral fellows. Labs in CHASS, CNAS and BCOE have a more heterogeneous distribution of post-doctoral fellows in their labs that likely reflects discipline specific preferences. We do not seek to advise individual faculty on how they choose to staff their own labs. However, BMSC program leadership are currently engaged in applying for NIH T32 and CTSA grants which would bring substantial funds for the hiring of post-doctoral fellows in the labs of participating UCR faculty.
Dear Prof. Ethell,

Attached, please find the response to the Graduate Council’s Findings and Recommendations resulting from the review of the graduate program that was submitted by Interim Chair Monica Carson on July 8, 2013.

Graduate Council thanks the program for their response to the Findings. The program’s responses are reasonable and show satisfactory progress moving forward on most of the issues that were identified in the review. The Council is very close to closing out this review but needs a little further information from the program first. With regard to the recommendation for providing a vision for how the graduate program will integrate with the new Medical School, would it be possible to provide the Council with the vision statement the program prepared for the NIH grant application that was referenced in response to Recommendation 2 attached? Hopefully this can be a simple cut/paste from the T32 application. Please also provide some of the details of the current grant submission (date submitted, potential funding date if approved, etc.). I am confident that with this bit of information, the program’s response can be presented to the Council at their next meeting in October and the review can be closed out.

Your response can be in the form of a memo to the Graduate Council, stating that the memo stands as a supplement to the program’s response to the Council’s Findings and Recommendations dated July 8, 2013. The Council would appreciate receiving this memo no later than October 21st, 2013.

Please let me know if you have any questions.

Thanks,
Sarah Miller
Graduate Council Analyst

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**Sarah Miller**

Academic Senate Office  
University of California, Riverside  
229 University Office Building  
Riverside, CA 92521  
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October 9, 2013

TO: Graduate Council

FM: Iryna Ethell, Director and David Lo, co-Director of PhD program in Biomedical Sciences

RE: Supplemental information to the program's response to the Council's Findings and Recommendations dated July 8, 2013.

Findings and Recommendations:

1. "Develop a strategic plan for the future of the Ph.D. graduate program, providing a vision for how the graduate program will integrate with the new Medical School. Included in this future plan should be discussion on how to integrate the clinical faculty in the Ph.D. training, targeted areas for future hires, and discussion of whether a new M.D./Ph.D. program is planned."

The School of Medicine is also actively developing partnerships with other UCR academic units and plans to develop research expertise in population-based health outcomes to further the goal of ultimately linking its basic and translational research to improve the health of the Inland Southern California region. The interconnectedness of the School of Medicine with the rest of the UCR campus will also enhance communication and collaboration across disciplines and further enrich the proposed training program by bringing medical perspectives to the molecular biology and epigenetics research enterprise.

The interconnectedness of the School of Medicine with the rest of the UCR campus is especially evident in the research enterprise. For example, in addition to the numerous collaborations between Biomedical Sciences faculty and research groups in Cell Biology and Neuroscience, Psychology, Bioengineering, there are also collaborations between clinical faculty and Engineering. A large number of our Biomedical Sciences graduate students are doing their thesis work in labs outside of the Biomed department. Finally, new collaborations are developing between clinical faculty and social science faculty in CHASS, with a near term goal to develop a research center in Population and Community Health studies.

A significant novel aspect of the Biomedical Sciences program and its association with the School of Medicine is the ability to train talented students in a combined degree program awarding both an MD and PhD, and this program will be launched very soon. The goal of the MD-PhD program is to develop Medical Scientists who will continue careers as primary researchers and scholars in health related topics. This contrasts with those gaining basic MD degrees or those with MD-Masters degrees (e.g., MPH, MBA, or Masters in Public Policy or Global Health) where the expectation is continued work in active clinical practice, public policy, or administration. Thus, selection of candidates is distinct from the approach toward the conventional medical school applicant population, where an ability to perform well in medical school coursework, commitment to primary
care, and communication and clinical skills are given primary consideration. Instead, selection will be primarily on the basis of aptitude and commitment to research, whether in a biomedical lab-based setting, translational/clinical research, or population studies, in addition to an ability to perform well in medical school studies. Among a typical medical school class of 50 students each year at UCR SOM, we expect to include one or two combined degree candidates.

The MD-PhD program has three distinct tracks: Biomedical Sciences (with the Biomedical Sciences graduate program), Biomedical Engineering (with the Bioengineering Interdepartmental Graduate Program), and Population Health (described below). Each track has a distinct course curriculum to combine medical school and graduate course requirements, along with time defined for PhD thesis research. Because of the unique aspects of each track, students will apply and be admitted to a specific track, and remain in that track to graduation.

While most Medical Scientists will continue on to Biomedical research careers, our school’s mission to serve community health issues motivated the development of a distinct MD-PhD track in Population Health Studies. The curriculum for this track is based in social sciences research, including studies in Medical Anthropology and Psychology, Clinical Outcomes studies, and related work on health topics. Here, PhD degrees will be awarded by specific graduate programs in Psychology and Anthropology, involving a subset of faculty with research interests in Population and Community Health topics.

Students in all three tracks of the combined degree program will begin their studies along with the conventional MD students for the first three years (two years of basic sciences coursework and a year of core clinical clerkships), although in each track they will also have additional coursework, lab rotations, and thesis preparation work. In addition, they will participate in the regular Friday BMSC254 (“Pizza Friday”) series throughout their studies when possible. Students will also participate in a monthly Combined Degree Student Research Colloquium, where research presentations and discussions will be guided by a variety of graduate faculty members.

In the final year of the program when a PhD defense is anticipated, a final series of clinical rotations will also be scheduled in part to develop experience to prepare for residency, as well as “audition” for the residency match in the coming year. These rotations will be designed to enable active clinical experiences as well as time to finish thesis work (lab work as well as writing time).

As noted above, the program is nearly ready to launch. We have been working with each of the graduate programs described, as well as with the School of Medicine and Grad Division. Since the combined degree program simply streamlines the course and research components of each degree, no significant changes are made to either degree requirements.
2. “As part of this, a training grant submission should to be a priority. “

On September 25th we have submitted a new Ruth L. Kirschstein NRSA Institutional Research Training (T32) Grant proposal in response to PA-11-184. Under the guidance of Program Director, Prof. Iryna Ethell and Associate Program Director, Prof. Xuemei Chen the proposed project, “Research Training in Molecular and Epigenetic Medicine,” will launch an interdisciplinary pre-doctoral training program that features a project-based and disease-oriented curriculum with a unique focus on molecular and epigenetic medicine. This proposal details a partnership between two long-standing graduate programs at UCR – the Ph.D. Program in Biomedical Sciences and the Ph.D. Program in Genetics, Genomics and Bioinformatics – to integrate training in the molecular basis and pathophysiology of human disease, using state-of-the-art genetic, epigenetic and proteomic approaches. If funded this proposed new program plans to enroll two trainees in 2014-2015 (one from each program), four in 2015-2016 (2 from each program), and six (3 from each program) in each of the following three years, for a total of 24 unique trainees during the life of the proposed grant.

The project summary, the mission statement and objectives are provided below.

Project Summary
This new Ruth L. Kirschstein NRSA Institutional Research Training Grant application requests funds to support research training in molecular and epigenetic medicine at the University of California, Riverside, one of the nation's most ethnically diverse research universities. The proposed interdisciplinary training program will build upon existing curriculum in the Biomedical Sciences and Genetic, Genomics and Bioinformatics Ph.D. programs to offer a new disease-oriented curriculum with a unique focus on epigenetic medicine. The goal is to train independent research scientists able to bridge the wide gulfs that currently exist between basic research and clinical medicine. The proposed program has 26 preceptors who are actively involved with the training of pre- and post-doctoral individuals and lead well-funded laboratories with total current year direct contract and grant support of $11.8 million from the NIH. Research areas of these faculty mentors include: molecular neuroscience with emphasis on molecular mechanisms of neurodevelopmental and neurodegenerative disorders, and neuroimmune interactions; medical and molecular genetics with focus on developing new genetic, epigenetic and bioinformatic approaches; and host-pathogen interactions and infectious disease, including immune control of viral or parasite infections and genomics studies of parasite biology aimed at new drug discovery. Pre-doctoral trainees will be selected from students enrolled in these two Ph.D. programs, which attract a diverse cohort of students with broad experiences, cultural backgrounds and “distance traveled” while maintaining attention to rigor of undergraduate and postgraduate preparation. Two years of support is requested for a modest number of trainees: two in the first year, four in the second year, and six in each of the following three years. In combination with institutional support, each trainee will be supported for five years. These 24 unique trainees will be exposed to a variety of genetic, epigenetic, bioinformatics and proteomic
approaches and learn to apply the new approaches to address clinically relevant questions through a project-based course, the Molecular Basis of Human Disease, which was developed for this training program. Trainees will be prepared for future careers in academia and industry through several existing and new seminars, workshops, symposia and other innovative venues. The request for funding of this research training program is supported by the relevance of the training to human health, the unique focus on epigenetic medicine, the excellent training environment, the superb experience of the preceptors in training pre- and post-doctoral individuals, the strong institutional commitment, and the diverse graduate student body at the University.

**Mission statement**
The mission of the proposed training program is to train independent research scientists who are able to bridge the gulfs that currently exist between basic scientific research and clinical medicine using the most current epigenetic, genetic and proteomic approaches.

**Objectives** are to: 1) prepare selected trainees proficient in applying genetic, epigenetic and bioinformatic approaches to the pathophysiology of human disease, drawing upon the strengths of the respective graduate programs; 2) stimulate a fusion of these two distinctive perspectives through additional faculty collaboration and co-supervision of trainees; 3) enhance student training in biomedical sciences through problem-based learning and a newly designed project-based course; and 4) attract trainees from diverse backgrounds and prepare them for future careers in academia or industry.
Bioengineering

Summary. An internal review of the Bioengineering Graduate program was held on July 9, 2012. Dr. Joseph Childers (Dean, Graduate Division), Dr. Ken Barish, Dr. Connie Nugent, and Dr. Morris Maduro met with Dr. Victor Rodgers (Chair). The purpose of this review was to gauge the progress this program has made since it began in the Winter of 2007. The program is scheduled to be assessed by an external review team in 2014-15.

The Bioengineering program is currently run by a core group of 12 faculty, with ~40 additional participating faculty from the Engineering college as well as from CNAS and Biomedicine. The program faculty are doing cutting-edge research that interfaces with many research programs on campus. Overall, the program seems to be building a strong base and cohesive community. Two particularly impressive aspects of the BIG program are their efforts to recruit new students, with an emphasis on diversity, and the strong success of obtaining NSF fellowships for students.

Findings and Recommendations.

1. Sustainability of recruitment efforts. The program and engineering college have set a high bar with their recruiting efforts. The program puts an extra effort in advertising, distributing high-quality, attractive documents such as research brochures and annual reports. Dean Abbaschian has provided financial support for applicants including $500 for transportation to visit the campus. The result of these efforts has been student cohorts that are diverse, and well represented by women and domestic students. This type of approach should be modeled by other graduate programs. The high level of student contact is currently supported primarily by a part-time staff person and Dr. Rodgers. The concern to address here is how sustainable these recruitment efforts can be, particularly if the program does not gain full-time staff support.

2. Defining participating faculty requirements. The criteria for consideration as a participating faculty member in the program, and rules for regular review of participating faculty, need to be delineated.

3. Courses. The program’s plan is to grow to a target of a total of 90 Ph.D. students, with ~45 M.S. students. Please describe how the program plans to provide appropriate number, breadth and depth of curricular offerings as it grows.

4. Funding of PhD students. Some of the students who enter the Ph.D. program are M.S. students who choose to continue in the program. These students cannot be funded as new fellows by Graduate Division. It is important to find a way to permit some funding for these students.

5. TAships. Make sure that the procedure for allocating TAships is transparent to students. In addition, since TAships for BIG students are generally given for engineering courses, problems can arise for students in the BIG program who join research programs of professors in colleges such as CNAS. Cooperative agreements regarding TAships should be reached among the colleges represented by the participating faculty.
6. *Vision for ties to the medical school.* As discussed, the future growth of the program could be enhanced if strong ties to the medical school are developed. Please provide some discussion of how the program envisions its future association with the medical school.
Response to Council’s Findings

Review of BIG (Bioengineering Interdepartmental Graduate Program)

Internal Review held July 9, 2012

Response by:

V. G. J. Rodgers, Professor and Chair of Bioengineering

October 22, 2013
Dear Internal Review Committee:

Thank you for your thorough review of the BIG program on July 9, 2012. We have listed your Findings and Recommendations below and have provided a response for each element.

**Sustainability of Recruitment Efforts**

**Findings and Recommendations**
The program and engineering college have set a high bar with their recruiting efforts. The program puts an extra effort in advertising, distributing high-quality, attractive documents such as research brochures and annual reports. Dean Abbaschian has provided financial support for applicants including $500 for transportation to visit the campus. The result of these efforts has been student cohorts that are diverse, and well represented by women and domestic students. This type of approach should be modeled by other graduate programs. The high level of student contact is currently supported primarily by a part-time staff person and Dr. Rodgers. The concern to address here is how sustainable these recruitment efforts can be, particularly if the program does not gain full-time staff support.

**Response**
Thank you for the wonderful complements relative to our recruiting efforts. The program is most appreciative of the support provided by BCOE and the Graduate College. We too are concerned with the limited position for our department in this area. However, with BCOE has now centralized recruiting efforts and it is expected that this can reduce some of the load on the staff.

**Defining Participating Faculty Requirements**

**Findings and Recommendations**
The criteria for consideration as a participating faculty member in the program, and rules for regular review of participating faculty, need to be delineated.

**Response**
In the past, it was sufficient to have someone interested in taking a BIG graduate student to advice. As our program has now matured, we are now in the process of revisiting the criteria for participating faculty and establishing a review process.

**Courses**

**Findings and Recommendations**
The program’s plan is to grow to a target of a total of 90 Ph.D. students, with ~45 M.S. students. Please describe how the program plans to provide appropriate number, breadth and depth of curricular offerings as it grows.
Response

All BIG students are required to take at least three courses from a selection of six Bioengineering core courses.

- BIEN 223 Engineering Analysis of Physiological Systems
- BIEN 224 Cellular and Molecular Engineering
- BIEN 245 Optical Methods in Biology, Chemistry, and Engineering
- BIEN 249 Integration of Computational and Experimental Biology
- BIEN 264 Dynamics of Biological Systems
- BIEN 270 Transport with Reactions in Biological Systems

In addition, students from non-engineering backgrounds are also required to take the core BIEN 264: Biotransport Phenomena or BIEN 270: Transport with Reactions in Biological Systems. All students are also required to take:

- BIEN 401 Fundamentals of Proposal Preparation and Ethical Standards in Bioengineering
- BIEN 402 Effective Writing for Bioengineering Research Publications

In addition to the six core course, the department also offers an additional 11 elective course. These are:

- BIEN 201 Mathematical Methods for Bioengineering
- BIEN 220 Chemical Genomics Design Studio
- BIEN 227 Biophotonics: Laser-Tissue Interactions and Therapeutic Applications
- BIEN 228 Biophotonics: Optical Diagnosis and Measurements
- BIEN 233 Computational Modeling of Biomolecules
- BIEN 234 Orthopaedic Regenerative Engineering and Mechanobiology
- BIEN 235 Vascular Biomechanics and Engineering
- BIEN 236 Nanomaterials for Regenerative Medicine
- BIEN 251 Biophotonics: Optical Microscopy and its Biological Applications
- BIEN 268 Bioengineering Experimentation and Analysis
- BIEN 271 Multi-scale Analysis of Biological Systems

Funding of PhD Students

Findings and Recommendations

Some of the students who enter the Ph.D. program are M.S. students who choose to continue in the program. These students cannot be funded as new fellows by Graduate Division. It is important to find a way to permit some funding for these students.

Response

We agree with this finding. Currently, students transferring from the M.S. to the Ph.D. who are residents can receive approximately $20,000 of support from the Graduate College via the Associate Dean of Research in BCOE. It is expected that these students find graduate advisors to
provide additional support. This is consistent with the requirements for students going directly into the Ph.D. program after their first year.

**TAships**

**Findings and Recommendations**

Make sure that the procedure for allocating TAships is transparent to students. In addition, since TAships for BIG students are generally given for engineering courses, problems can arise for students in the BIG program who join research programs of professors in colleges such as CNAS. Cooperative agreements regarding TAships should be reached among the colleges represented by the participating faculty.

**Response**

We are now taking the initiative to review the TA assignment process and establish one that is balanced. We plan for this process to be transparent. We are now addressing how to accommodate students who are on fellowship so that they can also meet the two minimum TA requirement.

**Vision for Ties to the Medical School**

**Findings and Recommendations**

As discussed, the future growth of the program could be enhanced if strong ties to the medical school are developed. Please provide some discussion of how the program envisions its future association with the medical school.

**Response**

The Department of Bioengineering proposes to two new senior faculty members during the next academic year with ½ time appointments with Bioengineering and the School of Medicine. In particular, we will solicit for individuals in the prioritized areas of neuroprosthetics.

President Obama’s endorsement of the several billion dollar Brain Activity Map (BAM) project has increased the potential in developing viable neuroprosthetics. Thus, this is a unique area that the Department of Bioengineering plans to provide as a focus for the Bourns College of Engineering in conjunction with the School of Medicine.

A number of faculty in Bioengineering are already working in related areas. Professor Rodgers is working in collaboration with Professor Devin Binder, neurosurgeon in the School of Medicine, on a brain interface device that will reduce cerebral edema. Professor Hyle Park is on an NIH grant to use OCT to rapidly detect seizures. He is also working with improving the spatial specificity of EEG in collaboration with Dr. Devin Binder. One of the main focuses of this research is to optically detect cortical brain activity without the use of exogenous contrast agents. The far greater spatiotemporal resolution afforded by such optical detection will be
used to read cortical signaling from smaller sets of neurons for enhanced control of a prosthesis instead of requiring electrodes implanted deep into brain structures or covering a large cranial surface areas.

In addition, these additional bioengineering faculty members will also catalyze research productivity with the School of Medicine. Currently we already have cooperative efforts with a number of faculty in the School of Medicine including Distinguished Professor David Lo M.D./Ph.D., Dr. Devin Binder M.D./Ph.D., and more recently, Professor Iryna Ethell.
Graduate Council Internal Review of the CMDB Graduate Program

Findings and Recommendations

Feb. 18, 2013

Introduction

The Graduate Program in Cell, Molecular & Developmental Biology (CMDB) was initiated in 1999 and offers both M.S. and Ph.D. degrees. The last external review of the CMDB program was conducted in April 2010. The CMDB program's response to the external committee's findings and recommendations was forwarded in April 2011. The Graduate Council formally accepted the CMDB program's response in a closeout letter in October 2011, but requested to conduct a follow up internal review covering four specific issues (addressed below).

Prior to the internal review, Jeff Bachant, the new Director of CMDB (replacing Peter Atkinson from the last external review), provided a Director's report according to the four specific points outlined in the closeout letter. Also, Jeff Bachant and Lynda Bell, Vice Chair of Graduate Council, jointly designed questionnaires for the CMDB faculty and graduate students, with specific questions tailored to solicit responses related to the four major points.

The internal review was conducted in October 26, 2012. The Graduate Council members that comprised the subcommittee for the internal review were Lynda Bell, Mike Vanderwood, and Jingsong Zhang, along with Dean Joseph Childers (ex officio). The review team interviewed Jeff Bachant and Dmitri Maslov (Graduate Advisor Admissions and Year 1). The review was structured around the four specific issues from the Graduate Council's closeout letter and the CMDB's report.

Review Team Summary

There were four specific issues from the Graduate Council's closeout letter and were addressed in the CMDB's response report.

1. The program needs to develop a clear vision to build and maintain a strong program.

In response to point 1, the CMDB report begins with the idea that CMDB must "think globally; act locally", which means that the program must address problems that are specific to CMDB ("local") but also to the current discussions of CNAS restructuring ("global").

In Part 1A (act locally), the program aims to create a "culture of excellence within CMDB". The CMDB program addressed the subcommittee's question on the intellectual rationale for CMDB. It argued that the CMDB program addresses the hierarchical complexity of biological systems and how researchers confront this complexity, and prepares the graduate students in the program with a breadth of training that can only be realized through an interdisciplinary approach. The interdisciplinary approach to life science graduate training has become the norm within the field.

The important point involves "eliminating redundancy." In the report and from many faculty questionnaire responses, there is the nagging problem of redundancy of courses and
responsibilities for both students and faculty to contend with, as well as a lack of commitment of faculty. Most CNAS life science faculty participate in multiple graduate programs to attract students to their laboratories. The CMDB program has begun working with GGB and Microbiology to offer a joint seminar series. CMDB will also join recruiting of graduate students and work on administering graduate student core courses. Along with these, there is an important issue on faculty membership and participation in CMDB, and the roles of CMDB, just a recruiting tool or a more coherence training program.

The CMDB program has instituted a "rigorous intramural seminar series" in which graduate students present their work on a weekly basis, but that faculty attendance when this first began in 2010-11 was very poor. The program will attempt again, but with new plans for assuring faculty buy-in: "...a core group of ~10 faculty will be identified that recognize the importance of these seminars and agree to participate". There is further suggestion that teaching credit might be offered, and this seems more sound.

To aggressively recruit the best graduate students, the current CMDB plan is to emphasize quality of students over numbers, and to "fight hard" for the best applicants. The point is made that better funding for the program would facilitate this plan.

The program will enhance the student participation. The program will engage the students with more social interactions and “professionalizing” activities.

In Part 1B (think globally), the important point here involves the future of CMDB within CNAS, and the CMDB report states that there is an “inequitable funding for CMDB within the current CNAS structure.” These are problems that this internal review of CMDB cannot resolve. Graduate Council believes that CMDB is taking the right approach by presenting a clear and compelling case about inequity in funding streams coming from CNAS for the support of graduate students.

2. The program needs to develop a plan for initiating/strengthening relationships with other campus academic units.

In response to point 2, the CMDB reports that there is a problem of “multiple scientific cultures within the life sciences in CNAS.” The CMDB views that these “cultural differences” are a remnant from the formation of College that became entrenched over decades. This has produced mixed allegiances among the CMDB faculty, not just to departments and programs, but to different ways of imagining their fields of study and hence, their capacity to commit to an interdepartmental program. In this situation, a goal defined by CMDB is for CMDB to become a leader, to “facilitate a unified cultural framework for the life sciences on this campus”. With regard to both CNAS and the new Medical School, the CMDB report notes that CMDB might be considered a likely candidate for full departmental status in the future in either of these units. The CMDB report notes that with respect to CNAS, “appropriate upper-level administrative vision, leadership and investment” would be necessary for CMDB to play a catalytic role in the restructuring process. Finally, the CMDB report comes down hard negatively on the notion that CMDB should be folded into an already existing department in CNAS, as this likely would contribute to the “walling off” problem that already is severe in CNAS.

3. The program needs to seek out commitments from department chairs to afford a
multi-year planning horizon for the core courses.

In this section, the CMDB report stresses that staffing core courses for the CMDB graduate program is really not as difficult or troublesome as the extramural report had stated. The claim is made that departmental chairs have been willing to work with CMDB in allowing their faculty to teach in one of the three core courses.

4. The program should consider making GSR support in grants a component of program membership….the program also needs to increase student fellowship application rates.

The CMDB report indicates that to make GSR support in grants a component of program membership would be very difficult to put into practice in an environment in which it has become increasingly difficult for faculty to count on continuous extramural funding. In addition, there seems to be no “plot” on the part of any faculty members to purposively exclude CMDB students from funding opportunities in their labs; and the faculty often noted that when they had NSF grants, the small portions available for graduate student funding usually allowed them to support only one or two students per year. The CMDB report also notes that, under worsening conditions for extramural funding for faculty, TAships well beyond the “normative” two quarter requirement have become commonplace.

Findings and Recommendations

1. The CMDB report has addressed the issue of developing a clear vision for a strong program and has made many excellent points. (a) There is still a critical issue on faculty membership and participation in CMDB and the overlapping life science graduate programs (here GGB, Biochemistry & Molecular Biology, and Biomedical Sciences) within CNAS. More program meetings may be necessary to resolve many of the conflicting opinions from faculty about many aspects of CMDB. The CMDB faculty may be grouped into a core and a periphery group. (b) The CMDB program will need to work with the CNAS Dean and Redesign Committees on the realignments of the funding to the CMDB program. (c) There needs to be development of a vision that states what their goal is in terms of the multitude of areas covered by the fields of Cell Development and Molecular Biology and how graduate students will be trained; what are the strengths and weaknesses of their program; how are they different from GGB, Biochemistry and Molecular Biology and Biomedical Sciences.

2. Graduate Council cannot solve funding and organizational issues within CNAS, nor can it advise about the desirability of closer ties with the new Medical School. While we recognize that CMDB suffers currently as an interdepartmental program because of the long-standing organizational difficulties in the Life Sciences, several areas of “local” action have been identified as part of this review, and we encourage the CMDB program to act on both fronts—to work upward with administrators toward solutions to financial and organizational problems for graduate programs within CNAS—the downward-facing work—toward the current faculty and students—is also vital to assure ongoing, continuous improvements in the current configuration of the graduate program. Identify and strengthen relationships with other academic units focused on a common vision.

3. The Graduate Council subcommittee recommends that the Director of CMDB, as well as
other interdepartmental program directors, should be allowed to sit on the Life Science Council of Chairs as a fruitful way to facilitate future discussion of staffing the core graduate courses. The Graduate Council subcommittee thinks this an excellent idea and hopes that a recommendation could be made by the full Graduate Council membership to this effect.

4. The CMDB program should act together as a coherent program to seek graduate training grants. Rotations should occur only through labs that have funding to support the students. Professors that sign up for students should be held accountable for their support. It should also provide opportunities and mentor the students to seek their own extramural funding (such as a CMDB graduate funding newsletter sent to faculty and students, outlining upcoming opportunities and deadlines). Moreover, the program should provide more “professionalization” training and opportunities (informing students not just of the opportunities, but mentoring them more closely on the fine art of grant writing).
To: Graduate Council

From: Jeff Bachant, Director, CMDB

Re: Clarifications on findings and recommendations from internal review.

Dear Graduate Council:

Thank you for your correspondence dated May 13 containing the findings and recommendations from CMDB’s internal review. CMDB is asked to provide two reports, one to be submitted by May 24 and a second to be submitted 6 months after completion of the CNAS redesign process. After consultation with the CMDB Executive Committee, I am writing to request clarification and guidance on several issues pertaining to our first report.

1) Regarding finding and recommendation 1c:
   An additional vision statement is requested addressing the three issues listed below.

   A) The report is to address program goals in terms of the multitude of areas covered by the fields of Cell Development and Molecular Biology. Clarification on what Grad Council sees as the multiple areas would help us.

   B) The report is to address how graduate students will be trained. A full description of our training program is contained in our handbook. What aspects of training does Grad Council want us to address?

   C and D) The report is to address strengths and weaknesses of CMDB and how CMDB is different from GGB, Biochemistry and Molecular Biology and Biomedical Sciences. Our interpretation is that Grad Council wants us to compare and contrast CMDB to a subset of life sciences graduate programs on campus. If so, we would like clarification along the following lines. First, CMDB is unclear how this relates to our internal review. Second, CMDB feels uncomfortable being asked to make statements regarding other programs. Third, CMDB’s opinion is that such a compare/contrast could most productively be done as part of the CNAS restructuring effort, or some other impartial process with everyone at the table. Fourth, CMDB feels it’s fair to ask why this particular sub-set of programs was selected. For example, why not compare to CMDB to departmentally-based programs? Fifth, is Grad Council interested in differences between programs in terms of the disciplines they encompass, their training programs, faculty affiliations, or all these angles?
2) Regarding finding and recommendation 2.

This finding generally concerns strategies for how CMDB might negotiate relationships with other academic units. We would like clarification as to what you would like us to address in our report.

CMDB is committed to complying with Grad Council’s requests, and we are appreciative of Grad Council’s efforts to address the problems surrounding life science graduate programs at UCR. We are respectfully seeking these clarifications because we want to provide Grad Council with the most useful and specific information possible.

Sincerely,

Jeff Bachant
Director, CMDB
June 10, 2013

TO: Jeffrey Bachant, Director, CMDB

FROM: Graduate Council

RE: Your request for clarification of Graduate Council’s Findings and Recommendations

At its meeting of June 6, 2013, Graduate Council considered your recent request for clarification on how to respond to our Findings and Recommendations document (hereafter, the F&R) conveyed to you on April 24, 2013, with a due date for your response of May 24, 2013—a date which has now passed.

At this juncture, Graduate Council believes that ongoing issues of overlap between graduate training in the CMDB program and other programs in the Life Sciences should be clear enough. In the questionnaire responses solicited from your own program faculty in the fall of 2012 as part of this current internal review, many responses discussed this overlap as problematic, especially with the graduate program in Genetics, Genomics, and Bioinformatics (GGB). We therefore suggest that you take up issues of overlap with your faculty immediately and solicit their input on an appropriate response to this aspect of our Findings and Recommendation document. In other words, we would like you to articulate the special strengths of the CMDB program at present and into the future. We cannot advise you how to present the unique strengths of your program, but because (coincidentally) the GGB graduate program is nearing completion of its own extramural review at present, we believe you might do well to consult with that program’s director, Shizhong Xu, who provided us with a lengthy and well-articulated response to our Findings and Recommendations, a document that covered many of the same points we have asked you to address. In short, Graduate Council would like to understand what is unique about training your faculty provides for graduate students who opt for the CMDB program, and we want you to present a clear and compelling statement to that effect.

As for the rest of our requests, we believe that a much higher level of clarity will emerge in terms of how to reply once you have attended to a sharper and more clearly articulated vision/mission statement. For example, you may want to revisit your program by-laws in terms of how faculty participation in the program is structured; GGB is in the process of a review of their rules governing faculty participation, and we have urged them to enforce their rules strictly, not just admonishing faculty members for failure to participate in program colloquia and meetings, but to actually dismiss them from program membership for such failures to participate. Undertaking such efforts in CMDB may also be necessary.

Graduate Council cannot guide you much further than this in how to respond to our F&R. We want to see CMDB thrive in terms of future capacity to compete within CNAS for support for its incoming graduate student recruits and to position itself to apply for external training grants (as noted in our current F&R document). However, without a more
clearly articulated vision and mission that distinguishes the unique strengths of the program, we believe that CMDB will continue to founder. Strong leadership for an interdepartmental program such as this is critical, as was noted in the extramural report in the spring of 2010; we would add that such leadership must find ways to interact more effectively with faculty who ostensibly operate within the program, but who themselves feel that CMDB is “redundant” with other Life Sciences programs (we are harking back here to questionnaire data collected from the faculty just last fall).

Please provide your response to our Findings and Recommendations document of April 24, 2013, no later than October 31, 2013. At that point, if we do not have a document in hand from you that clearly discusses your entire faculty’s vision/mission for graduate training in the program, and addresses the problems your faculty have articulated about overlap with other graduate programs in the Life Sciences within CNAS, Graduate Council will consider placing a moratorium on CMDB graduate admissions beginning in the fall cycle of 2014.

Cc: Dean Yates, CNAS
    Dean Childers, Graduate Division
**CMDB Mission and Structure of This Report:** The mission of the Graduate Program in Cell, Molecular and Developmental Biology (CMDB) is to deliver comprehensive training in experimental biology at the molecular and cellular level, leading to awarding of M.S. and Ph.D. degrees. The activities and interdisciplinary training of this program are designed to provide a solid foundation for future careers in bio-molecular sciences. A broad vision for CMDB is to become a leading national graduate program in this area, achieving parity with highly ranked programs of a similar nature at sister UCs.

CMDB admitted its first students in 1999. Since then, the program has awarded a total of 65 doctoral degrees and 15 MS degrees, and as of fall 2013 there are currently 32 students enrolled in the program. CMDB is a broad-based interdepartmental graduate program (IDGP) with 63 participating faculty members drawn from eight CNAS departments, the School of Engineering, the School of Medicine and the Division of Biomedical Sciences By training students in top laboratories on campus conducting research in cell, molecular, and developmental biology, CMDB plays an important role in advancing both the research and instructional missions of the University.

CMDB is responsible for all program functions related to recruiting, funding and training our students. These activities are overseen by a program director in conjunction with an executive board. Administration of the program additionally involves two graduate advisors, classroom instructors, and CNAS support staff. Financial support for CMDB students is provided by GSR and fellowship packages from CNAS and Graduate Division during the students’ first year. After the first year, students are supported on faculty grants or through TA positions.

For this internal review, Graduate Council has requested CMDB comment on the following:

- Why are cellular, molecular and developmental biology all included in one graduate program?
- What are the unique strengths of CMDB?
- What is the plan for securing faculty commitment to CMDB?

The following program meetings were convened in preparing this report. Agenda for these meetings are included at the end of the report.

- A general CMDB student meeting on Sep. 25, 2013.
- A meeting between CMDB and GGB officers and course instructors on Oct. 17, 2013.
- A general CMDB faculty meeting on Oct. 29, 2013.

1) **Pedagogical Rationale for CMDB:** Graduate Council expressed concern about including molecular, cellular and developmental biology within a single graduate program. This seemingly broad focus arises from the belief, generally shared within our field, that an interdisciplinary approach is critical for training tomorrow’s biological researchers. Throughout their careers, it is now expected that biologists will need to perform experiments and integrate research findings at multiple levels of biological organization, ranging from individual molecules to whole organisms. As described in the BIO2010 report from the National Academy of Sciences:

“The ways in which we pursue research in biology are changing rapidly. In the past decade, powerful innovations—including recombinant DNA, instrumentation, and the digital revolution—have altered fundamentally the ways in which biology is done. Biologists are increasingly intrigued by the challenges of deciphering how components such as molecules, cells, or organisms interact to produce higher-order structures and properties. They are studying the ways in which molecules can affect cells, or ways in which cells can affect organ systems, or
how individual organisms affect populations and ecosystems. At all levels of biological organization, the understanding of integrated systems is moving to center stage.”

For this reason, an interdisciplinary approach to graduate training is now the norm within our field. Most leading research universities have a graduate training program in place that is similar in scope to CMDB, although its precise name may differ. A sampling of CMDB-type programs offered at some sister UC campuses is given below; a more complete listing can be found at the National Research Council’s database on life science graduate programs (sites.nationalacademies.org/PGA/Resdoc/). This is also why CMDB has not adopted a track structure and instead has a single unified curriculum of core courses taken by all our students. We feel this is the right approach to give our students the broadest possible training.

UNIVERSITY OF CALIFORNIA-BERKELEY Molecular and Cell Biology
UNIVERSITY OF CALIFORNIA-DAVIS Biochemistry, Molecular, Cell and Developmental Biology
UNIVERSITY OF CALIFORNIA-IRVINE Developmental and Cell Biology
UNIVERSITY OF CALIFORNIA-LOS ANGELES Molecular, Cell and Developmental Biology
UNIVERSITY OF CALIFORNIA-SAN FRANCISCO Developmental and Stem Cell Biology
UNIVERSITY OF CALIFORNIA-SANTA BARBARA Molecular, Cellular and Developmental Biology
UNIVERSITY OF CALIFORNIA-SANTA CRUZ Molecular, Cellular and Developmental Biology

2) Unique Strengths of CMDB: Graduate Council has asked us to describe the distinguishing features and strengths that CMDB offers its students and participating faculty.

- **CMDB is the principle graduate program at UCR training students with research interests in molecular, cellular or developmental biology across a wide range of model biological systems.** Among other IDGPs, CMDB does have some overlap with GGB with respect to a training focus on genetics and some aspects of molecular biology. But there are different emphases between these programs that are apparent to researchers in our field. In particular, whereas GGB tends to attract students with specific interests in genomics and bioinformatics, CMDB attracts students oriented towards “wet lab” research in molecular genetics in NIH/NSF model systems. Thus, CMDB fulfills a unique graduate student training function on campus.

- **CMDB is effective at recruiting students, and our students do well after graduating.** More students currently apply to CMDB than to any other life science graduate program at UCR (492 total applicants from 2005-2009; 152 applicants in 2013). With respect to GPA and GRE scores our entering students compare favorably to those recruited by other UCR graduate programs. Furthermore, and as recognized in our 2010 external review, CMDB graduates tend to benefit from their training. For example, the 2010 Excellence in the Delivery of Graduate Education Report found that, between 2005-2009, 80.7% of our graduates went on to positions as post-doctoral fellows, tenure-track faculty positions at 4 year institutions, or research and development positions. Thus, CMDB is an attractive program for prospective life science graduate students considering UCR, and our training allows them to be competitive following graduation.

- **CMDB offers a well-designed curriculum with high quality instruction and monitoring of student progress:** CMDB has invested considerable effort in developing a strong curriculum featuring sequenced core courses in cell (CMDB 200), molecular (CMDB 201) and developmental biology (CMDB 202), as well as additional elective courses. The instruction in our core courses consistently rates highly in student surveys. As described below, the effort
CMDB has placed in developing our curriculum has proven to be of value to life science graduate programs besides CMDB.

Due in part to recommendations from our 2010 external review, CMDB has made a deliberate effort to establish a very specific set of metrics to evaluate student progress through our program. In particular, CMDB is somewhat unique among current life science IDGPs in the extent to which it rigorously enforces annual student progress reports, which necessitate a meeting of the student’s full thesis advisory committee, as a condition for continued enrollment. Thus, we believe a distinguishing strength of CMDB is that it is a well-structured and well-administered program.

**CMDB is critical to the success of our participating faculty.** To quote from our 2010 external review, “CMDB…is essential to bring the kind of graduate students to campus that …excellent young faculty….need to carry out successful research programs. Thus the success of recently hired faculty depends upon the success of this graduate program”. Furthermore, although most of our participating faculty members are also members of other graduate programs, there are some whose research specialization is such that they recruit mainly through CMDB and tend not to get students through other programs. Thus, participating faculty members rely on CMDB students to perform their research.

**A program with the scope of CMDB will be necessary to achieve the increases in graduate student enrollment envisioned in the 2020 plan.** Life sciences remain a growth area, with significant federal funding opportunities available through NIH and NSF. The UCR 2020 vision plan calls for a 20% increase in graduate student enrollment, with this expansion being largely funded through securing more faculty grants. From among the current graduate programs in CNAS, it is hard to imagine how UCR will achieve this target without something like CMDB in place to attract and train these additional students. Thus, CMDB is likely to play an important role in driving the growth of the life sciences on this campus.

**3) CMDB Membership and Faculty Participation:** The following except from our bylaws spells out current criteria for faculty membership in CMDB.

The activities that justify membership include: (a) participating in the teaching of courses that are required for the operation of the instructional component of the M.S. and Ph.D. programs, e.g. CMDB 201, 202, 203, and 281; (b) taking an active role in the administration of the Program by serving on administrative committees; (c) serving as a Graduate Advisor or other Administrative Officer of the program; (d) contributing to the training and mentoring of CMDB graduate students in his or her laboratory; and (e) maintaining an active funded research program in a CMDB subject area, including support for graduate students. Other contributions expected of all faculty to support continued membership in CMDB include: chairing or service on any one of the CMDB committees; providing and grading questions for the Written Examination; serving on Ph.D. Oral Qualifying Committees, Dissertation Committees, or student Guidance Committees; assisting the planning and presentation of the Annual CMDB Research Symposium; assisting in the preparation of Fellowship Training Grant applications for the CMDB Program; participation in laboratory rotations for entering students; participating in elections and attendance at the Annual Faculty Meeting.

In response to our 2010 external review, CMDB evaluated its membership with respect to these criteria, resulting in a number of faculty members being removed from the program. As far as we are aware, CMDB is the ONLY interdepartmental life science graduate program to have undertaken such a review in the past decade. CMDB agrees with Graduate Council that it is
important to rigorously enforce standards of faculty participation, and that CMDB should enact what measures it can to stimulate faculty engagement with the program. A plan to achieve this is described below. To be successful, the plan must address the following two widely recognized issues.

- **IDGPs are not empowered in the current structure of CNAS.** Despite this, CMDB continues to grow because the program helps support the research of a large segment of CNAS faculty. In addition, many faculty members feel an affinity for the interdisciplinary approach to graduate training embodied by CMDB. These considerations constitute powerful advantages to CMDB. In order to capitalize on these strengths, however, it is important to build elements of program structure that faculty feel they can relate to in a meaningful way.

- **There is considerable redundancy between current life science IDGPs.** This situation unnecessarily compounds faculty workload and has the overall effect of diminishing the sense of faculty ownership of these programs. For example, as just one facet of the redundancy issue, ~80% of CMDB faculty members also participate in GGB. CMDB has been trying to address this redundancy by streamlining overlapping program activities wherever possible. Our efforts to create a joint extramural seminar series has been successful in improving faculty attendance, and efforts to work in concert with other programs are described below.

4) **CMDB Plan and Timeline:**

- **Fiscal (2012-2013):** When this internal review began in 2012 an immediate priority was to shore up the finances for CMDB, and at that time we described a plan to address this. This part of our plan has been largely enacted, as CMDB was successful in advocating through the CNAS Dean’s office to re-bench GSR funding for the life science graduate programs. The result of this, as shown in the figure below, is that GSR allocations for CMDB have more than doubled, and our allocation is projected to increase somewhat further over the next few years. At the end of last year, CMDB completely paid off its debt to the college, and we now project being able to reach our recruitment targets while maintaining a positive balance. Furthermore, recent discussions with the CNAS Dean suggest that CMDB will be allowed to carry forward unexpended funds from one fiscal year to the next, providing flexibility in multi-year budgeting and solving student shortfall issues. The next step is to work towards obtaining a training grant, which would allow CMDB to offer multi-year support packages and compete more effectively for top-notch domestic students. As recognized in our 2010 external review, CMDB’s ability to successfully compete for a training grant will be enhanced by creating a more robust program structure. Steps in this direction are described below.
Program Redundancy (2013-2014): During this past summer the GGB program developed a proposal to consolidate their track structure into a single program. CMDB was affected by this proposal because it called for placing our CMDB 201 Molecular Biology course at the head of GGB’s proposed core sequence. The CMDB director thought this presented an opportunity for the two programs to work jointly to explore the possibility of a more coordinated curriculum. Following a series of informal discussions, CMDB organized a joint meeting between GGB and CMDB program officers, classroom instructors, and representatives of other programs on Oct. 17, 2013. As a result of this meeting, a committee was put in place to develop a new course in genetics that will be structured to meet the needs of both programs. This plan was presented at a recent CMDB faculty meeting on October 29, 2013 and received considerable support. The course development committee is therefore working to submit a course proposal for the December 2013 deadline. CMDB has also recently engaged in streamlining course offerings with the Botany and Plant Science graduate program, resulting in a decision to jointly administer the CMDB 202 and BPSC 232 Developmental Biology courses. Over the last two years, this cooperative approach appears to be working to the benefit of both programs.

Faculty Participation (2013-2014): As recognized in our 2010 external review, an intramural seminar series where students present and receive feedback on their research findings typically constitutes the “intellectual home” of an IDGP. The rigor and enthusiasm of faculty participation in these seminars is a primary determinant of the culture of the program. As part of a plan to invigorate faculty ownership of CMDB, we propose to institute this type of seminar series. The details of this plan can be found as item 5 in the agenda for the general CMDB faculty meeting held on October 29, 2013, which is appended at the end of this report. As part of this plan, CMDB proposes to alter its bylaws such that a reasonable standard for faculty participation in the intramural seminar series will constitute one metric for faculty membership in CMDB. This is a major change for the program, but, based on our recent meetings, there appears to be a general willingness to try and make this work. CMDB will now proceed to develop the specifics of how to structure this seminar course, and consider what sort of format might work best. A follow up faculty meeting will then be held in winter quarter of 2014 to gauge faculty buy in. Once we have reached a consensus, we will seek to initiate the new seminar series starting in fall 2014.

An important component of this plan that has a bearing on how to design the intramural seminar course is that we also intend to use this course as a vehicle for professional development. Part of our vision for this course is that, in addition to professional development offered as part of the seminar series, we will also require student attendance at a minimum number of workshops offered by the Graduate Division. CMDB will work with the coordinator of these workshops to ensure presentations that are germane to CMDB students are developed and placed on the schedule. This should provide CMDB with a flexible format for professional development that can be adjusted as necessary to accommodate ongoing efforts to create graduate student professional development courses within CNAS.

Additional Program Changes (2013-2014). A number of additional changes to CMDB are also envisioned. These include updating the CMDB web site, institution of newsletters from the director, and changes to solve issues with the written qualifying exam. The director will explore the possibility of a joint program symposium with GGB (and potentially other programs) and will ensure that newly hired Medical School faculty are encouraged to join and participate in CMDB.

Assessment (2015-2017). It will be important to assess the effect of our plan on creating a more cohesive program once the new seminar series has been in place for several years. Whatever changes may emerge from the ongoing CNAS redesign will also be more apparent at
this time and may have an affect on CMDB’s future. Once this point is reached, we will have a formal evaluation of program membership through our membership committee. An important task for program leadership during the intervening time will be to make our member faculty realize that while maintaining inter-related IDGPs as separate entities may be perceived as beneficial for effective recruitment, it comes at the cost of efficiency in administering these programs. If CMDB emerges from this period in an invigorated fashion, the hope is that it would be poised to compete strongly for a T32 style training grant. This would be the next step for the program in its goal to achieve recognition on parity with flagship CMDB programs at sister UCs.
Agendas from recent CMDB program meetings
Agenda for CMDB student general meeting
Wednesday Sept. 25, 2013

1) General comments from the Director.

2) Seminars
   I understand people are unhappy. Why is that?
   What if:
   
   a) You only had to attend one extramural seminar a week (your home seminar) to satisfy your CMDB 257 requirement?

   b) Your home seminar would be determined by your major professor. If your home seminar was not the regular CMDB/GGB series, your major professor would be required to certify your attendance to receive credit.

   c) Student member for seminar committee?

3) Student Symposium
   The Director’s view is that the student symposium (not just for CMDB but for other programs as well) is largely moribund. This is mostly because of faculty apathy and poor attendance. They are also expensive.

   a) I would like to hear your views-keep it, change it, get rid of it?

   b) What if the symposium were replaced by a weekly intramural student presentation series organized along the lines described below? The goal would be to create an intellectual and social heart for CMDB. This is currently lacking and is an attribute that normally defines a successful graduate program.

      - Students required to attend.

      - Faculty participation would be the key. One idea is to develop some type of incentive for a certain number of faculty who agreed to attend each week.

      - There would be some sort of rotating schedule for presentations from second years on up-maybe 2X 20 min talks per week with time for questions. Students preparing for orals could give practice talks, students wrapping up could showcase their stuff.

      - Pizza/refreshments afterwards.
4) Changes to written qualifying exam

The current formulation of the WQE is such that the exam is more like a “final”.

What if the GPA expectation of the core series were raised a bit? Students that passed this bar would then proceed to prepare for orals. Students that didn’t might have to take something similar to the current WQE. To satisfy Grad Division requirements, we would then add some sort of written component to the qualifying exam, perhaps similar to how GGB does it.

5) Grad student association. Que passo?

6) Other issues, what else can I be doing for you? Kathy tells me the availability of CMDB 281 courses is an issue.
Agenda-Grad Curriculum

1) Discuss pros and cons of the following models for GGB and CMDB core sequences. As suggested previously, enrollment issues are one thing to consider.

   a) Current GGB proposal.

   b) There has been discussion of a “Genetic logic and experimental biology” type of course. A syllabus from the Univ. of WA that has received some support as a possible model is attached. In one scenario, this course-if developed-could be offered as part of the core sequence for CMDB and/or GGB, potentially being taken concurrently with CMDB 201 in the fall quarter for entering students.
2) Continued integration of BPSC and CMDB core courses. From my standpoint as CMDB director, the joint teaching of CMDB 202 (Developmental Biology) and BPSC 232 (Plant Development) has been quite successful. A question would be whether we wanted to continue this approach with our respective Cell Biology courses.

3) What can inter-departmental program directors do to incentivize graduate level instruction?

4) Other issues.
Agenda Item 1: Report on CMDB finances.

First the bad news, beginning with two quotes from the UCR 2020 Vision Plan.

“To achieve the profile of an AAU institution, UCR will increase the proportion of graduate and professional students to 18-20 percent of the total student population in the next decade……”

“Graduate student financial support will be funded at a level that enables UCR to provide multi-year support packages that can close the competitive gap with other institutions…UCR will provide stable graduate student financial support that is adequate relative to the cost of attending the university, and packages equivalent to or better than those offered by institutions competing for the same pool of high quality students. To reach this goal, UCR faculty will be incentivized to generate additional student support through extramural research funding.”

In other words, we’re likely to have to fund these proposed increases on our own.

Along those lines, here are some numbers Kathy assembled from TAAC meetings over the past three years. The number of Ph.D. students that are not being assigned TA positions has been increasing (these numbers are for CNAS as a whole, not just CMDB). With 2020 just around the corner I think the data is a bit sobering. The other point is that the TAAC process is now quite competitive. If your student needs a TA position you should work closely with them on entering information into the system. It is crucial that they look like an eligible and attractive applicant, and that they rank their course preferences strategically.

Now the good news.

Thanks to Peter’s efforts to re-bench GSR funding, CMDB’s allocation has increased. In 2012 CMDB spent itself about $40K in the hole to recruit a “survival” size class that approached our Graduate Dean target. With our enhanced allocation that debt is now paid off and we should be able to stay in the black. Just as significantly, our funding may no longer be tied to our first year cohort, and CNAS’s policy of resorbing unexpended balances at the end of each fiscal year may be discontinued. That would give the program much greater flexibility in solving problems related to student funding.
Agenda item 2: Possible changes to the written qualifying exam.

The issue. Several years ago, CMDB changed the format of its written qualifying exam so that core course instructors were included as *de facto* members of the WQE committee. This was done because the feeling was that the WQE questions were having little connection with the material the students were getting in the core courses. As a result of this change, the questions have become very aligned with the core course material, so much so that some have questioned whether the WQE is substantively different from an additional core course exam. Also, the core course instructors effectively end up doing all the heavy lifting on the WQE, writing the questions and grading the answers.

Proposals for consideration:

1) Switch to a WQE format more similar to GGB. In this case, a student’s oral qualifying exam committee would prepare the questions for the WQE, and the exam would be administered prior to the oral exam. Arguments in favor of this approach are that it gives the student more time to mature intellectually compared to taking the WQE immediately after the core courses. Also, it distributes the workload more equitably among the faculty.

Associated with this, we could increase the minimum GPA requirement for the core courses, which, if not met, would trigger a first year assessment exam similar to the current WQE.

2) Keep the current structure of the WQE but devise a different relationship between the instructors and other WQE committee members to equalize the workload.

During a recent meeting with the students I did not get a sense that they had a clear favorite model.
**Agenda item 3: Possible changes to the CMDB 257 requirement**

The issue. Some students are unhappy because they are required to attend both the CMDB 257 joint seminar series and a different weekly seminar series at the behest of their major professor.

Proposal for consideration. We could conceivably have a policy where each CMDB student was required to attend just one weekly “home seminar” to satisfy their CMDB 257 requirement. Selection of an alternative CMDB 257 seminar series would be at the discretion of the major professor, who would need to certify attendance in order for the student to receive CMDB 257 credit.

The students appeared to be of mixed minds on this. Some advocated strongly for it. Others argued that it was important for students to hear about research outside their own area.

**Agenda item 4: Development of a new “genetics logic course”**.

The issue: GGB is proposing to collapse their current track structure into a single program with a unified core course structure, similar to CMDB. This proposal affects CMDB because it includes placing CMDB 201, our molecular biology course, as one of the main courses students would be funneled into at the head of their proposed core course sequence. As a result of discussions between CMDB and GGB, it became apparent that a graduate course emphasizing genetic logic/genetic reasoning was seen by many members of both programs as something that would enhance the curriculum, and from my standpoint as director it seemed to present a chance for the two programs to work synergistically. Following a recent meeting, a course development committee has been put in place to design the syllabus for such a course, and this is in progress. To give a flavor of what this course might look like, a syllabus for a similar type of course from the University of Washington is attached.

Proposal for consideration: If GGB and CMDB faculty members end up supporting this plan, CMDB students would have the following first year sequence.

Fall quarter:
CMDB XXX: New genetic logic course (3 units)
CMDB 201: Molecular biology (4 units)

Winter quarter:
CMDB 200: Cell Biology (4 units)

Spring quarter:
CMDB 202: Developmental Biology (4 units). CMDB 202 is currently being taught in a joint fashion with PBPL’s Plant Developmental Biology course, which seems to be working well.

Some other alterations we may want to consider if this new course is put in place could be to limit students to one five week rotation in the fall quarter and considering reducing elective requirements once the core course is complete.

A flow chart showing the relationship between the CMDB and GGB curriculums is shown below. I’d be interested in hearing comments on this. Once the course is designed, we will bring it forward, together with any accompanying alterations to program structure, for a formal vote.
Agenda item 5: Revisiting the idea of a CMDB intramural seminar series.

The issues: Here are some quotes from CMDB’s 2010 external review.

“CMDB...is essential to bring the kind of graduate students to campus that ...excellent young faculty.....need to carry out successful research programs. Thus the success of recently hired faculty depends upon the success of this graduate program....Some actions could be taken to foster the emergence of a coherent training program and environment....we recommend the immediate institution of a weekly (intramural) seminar....attendance would be a requirement for a faculty member to be part of the training program....such a weekly commitment to the program could change the culture....there is no conceivable way that this program can successfully compete for a training grant before considerable changes have been made.”

Based on these comments CMDB tried to institute an intramural seminar series in 2011/2012. This series was not successful due to a lack of faculty participation. There are two additional inter-related issues that impinge on this agenda item as well.

1) The annual research symposium. We’ve tried a number of different formats but faculty participation and enthusiasm remains minimal. The students are cynical about the symposium. If we do not choose to pursue some variant of the course of action proposed below, one possibility is to work in conjunction with GGB to see if a joint symposium might be possible.

2) CMDB needs a plan for a professional development course.

Proposal for a weekly intra-mural seminar series that enforces faculty participation. As director, I’ve been trying to think about how CMDB could do a better job instituting an intramural seminar series. It is not an easy task given that inter-departmental graduate programs are adrift within the current organizational structure of CNAS, and that there is redundancy between many of the life science graduate programs. Nonetheless, CMDB needs some sort of intellectual core to the
program, and what follows below is an effort in this direction. This proposal is of course completely open for discussion, as success will require faculty buy in.

1) CMDB 258 would be utilized as a pre-existing course that could be reorganized to constitute a new intramural seminar series and a professional development course. We can discuss jettisoning the annual research symposium and redirecting those S&E expenditures into this seminar series.

2) CMDB 258 would be offered fall, winter and spring quarters. Students would be required to sign up for both CMDB 257 and CMDB 258. Grading would be S/N and based primarily for attendance, even for students giving talks.

3) A new faculty coordinator position would be created for CMDB 258, in essence similar to the coordinator for CMDB 257.

4) The CMDB 258 coordinator would be charged with organizing a rotating schedule of faculty members to act as instructors for the course. Faculty instructors would attend each week in that quarter for the purpose of providing feedback on student, post-doc or faculty presentations. Faculty that were not otherwise engaged in CMDB teaching or specified aspects of program service would be required to be in the rotation for being a CMDB 258 instructor as a condition of membership in the program (changes to bylaws regarding membership are outlined at the end). The rotating schedule would be planned with a number of faculty instructors for each quarter so that every faculty member would be expected to be an instructor one quarter out of every two years as necessary to meet this requirement. This might give us between 5-10 faculty for each quarter, although it will be important to do the math. The absolute number of instructors could vary from quarter to quarter to meet this goal.

5) All faculty members would be encouraged to attend CMDB 258 as regularly as possible regardless of whether they are serving as a current instructor. Again, the goal is to create an intellectual home for CMDB faculty.

6) CMDB 258 would meet for an hour each week (avoiding the CMDB 257 seminars on Wednesday) featuring either one longer or two 20 minute presentations, by students, post-docs or faculty members. Material related to professional development could also be presented during some meetings. The CMDB 258 coordinator would schedule a series of presentations for each quarter around ongoing student needs such as preparing for oral exams, thesis defenses, or conference talks. The goal would be to have flexibility while maintaining an overall balance having students give presentations.

7) Each weekly meeting of CMDB 258 would be followed by a social hour with food and drinks.

8) CMDB 258 could be utilized for professional development in one of three ways:

   a) Receiving feedback on student projects and presentations is a crucial part of professional development.

   b) Specific aspects of professional development could be presented, much as David Lo did when he ran the last iteration of the seminar series.
c) Students could be required to attend a certain number of the professional development workshops offered through Graduate Division. The CMDB 258 administrator could work with Graduate Division to develop/schedule topics that would be useful to CMDB students.

d) We should emphasize that student contact with extramural speakers (during the lunch for example) also constitute an important part of professional development.

9) The above changes would necessitate that CMDB bylaws be amended to reflect the following requirements for program membership. In essence, each faculty member would be required to do one of the following.

a) Participate in the teaching of courses that are required for the operation of the instructional component of the M.S. and Ph.D. programs, e.g. CMDB 201, 202, 203, and 281; (I would add being the organizer/lead instructor of CMDB 257 and CMDB 258 to this list).

OR

b) Take an active role in the administration of the Program by serving on administrative committees (we should spell out the committees), including serving as a Graduate Advisor or other Administrative Officer of the program.

OR

c) Participating as an instructor in the CMDB 258 graduate student seminar series for at least one out of every six academic quarters, not counting quarters spent on sabbatical leave.
Syllabus

Analyzing Function by Classical Genetic Approaches

Classical genetic analysis is a powerful approach to dissect complex biological processes. Selective removal, addition, or alteration of specific proteins creates mutant phenotypes that give insight into the normal roles of those genes. Analysis of double mutants lets one deduce the order of events and infer interactions between proteins. These methods let one propose mechanisms for processes that may be too complex to study effectively with biochemical or molecular approaches. Genetic studies can also provide definitive functional assignments for predicted genes, regardless of whether those genes exhibit sequence homology or have orthologues in other systems.

We will employ genetic analysis to identify and characterize genes governing mating of yeast and patterning of the Drosophila body and the Arabidopsis flower. We will discuss methods for disrupting gene function randomly, through large-scale mutagenesis screens, and specifically, through homologous recombination or construction of chimeric genes. This latter approach will let us investigate structure/function relationships within proteins. We will evaluate the nature of mutant alleles, considering the effects of dominant vs. recessive mutations and the impact each has on our interpretation of a process. We will use epistasis tests to establish the order of genes in a pathway. Finally, we will discuss the tissue and temporal requirement for gene function and consider how these insights from model organisms inform our approaches to understand phenotypes in other organisms.

Meeting Time and Place
Tuesday / Thursday 9:00 am – 10:20 am Foege S110

Course Materials SLN 13720
1) Web page with link to Course syllabus:
http://www.gs.washington.edu/academics/courses/

2) Electronic copies (pdf format) of each assigned article are on reserve in the UW Catalogue under electronic "Course Reserves". Log into the Course Reserves page using your MyUW id and look up the course by title (GENOME 553) or instructor (Queitsch).

3) Download "Questions for Thought" in pdf format by linking to the QfT on the syllabus page. Hard copies of each QfT will be available at the preceding class session.

Grading
25% assigned homework for each reading
25% participation in class discussion (ASK QUESTIONS!)
50% final exam

Syllabus

Part One: Genetic Analysis in a Single-cell Eukaryote

Tues Jan 6 Introduction:
When and why should one use genetic analysis? What is genetic analysis? To understand the major concepts in genetic analysis, we will begin by studying the work carried out by Lee Hartwell and colleagues to analyze cell-cycle regulation in yeast, emphasizing the control of cell- cycle progression by the mating pathway. The first meeting will consist of a lecture format introducing students to the yeast system, cell cycle, and nomenclature, and ending with a synopsis of Lee Hartwell's initial screen for temperature-sensitive mutants in yeast. Future meetings will consist of discussions based on assigned readings and "Questions for Thought".

Assigned:

Optional Background Reference:

Optional Review:

General Background References for Yeast:
Yeast Data Base (SacchDB): http://www.yeastgenome.org/

Thurs Jan 8 How mutant phenotypes give insight into a biological process.

Assigned:

questions for thought

Tues Jan 13 Ordering genes in a pathway by double mutant analysis.

Assigned:

questions for thought

Thurs Jan 15 How to interpret function based on differences in alleles.

Assigned:

questions for thought

Tues Jan 20 Using genetics to characterize the structure and function of a protein.

Assigned:

questions for thought

Part Two: Genetic Analysis in a Metazoan System

Thurs Jan 22
The genetic principles used to characterize biological phenomena in single-celled organisms also apply to multicellular organisms. In these more complex systems, the methods and logic emphasize the analysis of tissue-specific vs. pleiotropic functions, and redundant genes or pathways. We will examine genetic control of morphogenesis in flies, beetles, and flowers as a tool for understanding metazoan genetics. The first lecture will introduce students to fly and Arabidopsis genetics, nomenclature, and genomics.

Assigned:

Optional Background References:
flies.


General Background References:
FlyBase http://flybase.bio.indiana.edu/

Arabidopsis thaliana data base: TAIR http://www.arabidopsis.org/

Tues Jan 27 Defining the pathway: Isolation of mutants; phenotypic characterization; mosaic analysis.

Assigned:

questions for thought

Thurs Jan 29 Exploiting evolution: understanding developmental pathways through comparative genetics.

Assigned:

questions for thought

Tues Feb 3 Arriving at pathway models: dissecting complex phenotypes with allelic series.

Assigned:

questions for thought (word)
questions for thought (pdf)

Thurs Feb 5 Necessary and sufficient: reverse genetics solves complications of redundancy.

Assigned:

questions for thought

Wed Feb 18 Take-home Exam Due, 5 pm. NO EXCEPTIONS.
Graduate Council: Attendance and Participation Policy

For discussion and vote: Graduate Council meeting of Oct. 17, 2013

The business of Graduate Council is of vital importance to the health and wellbeing of graduate instruction on the UCR campus. For that reason, regular Council meetings are scheduled in advance for the third Thursday of every month, from 9 to 11 a.m. (except in instances of holiday or break, when slight alteration in the schedule occurs, usually moving the meeting forward by one week). When Senate faculty are appointed to serve on Graduate Council, it is expected that they will be available to attend all of these meetings except under special circumstances, such out-of-town conference attendance or research. When a special circumstance arises, faculty members of Graduate Council should notify the Graduate Council Senate analyst as far in advance as possible; the analyst will also notify the Chair of Graduate Council.

When a faculty member of Council misses a meeting without notifying the Senate analyst in advance, the Chair shall make an inquiry, urging the member to keep in mind that attendance is importance to the smooth functioning of all Council business.

When a faculty member of Council misses two consecutive meetings with or without special circumstances, it shall be up to the discretion of the Chair to recommend that the member resign, and to ask the Committee on Committees to begin a search for an immediate replacement.

The same general principle about attendance and participation applies to Graduate Council subcommittee meetings, including Courses and Programs, Fellowships, and program review subcommittees. In addition to attending meetings, subcommittee members must read materials in advance, rank applications (on occasion), and participate in the writing of draft documents related to graduate program reviews. If any Council member is lax in these additional duties, it will be up to the Chair to determine if the member is still willing and able to serve on Graduate Council.