2012-2013 Assessment Report
Department/Unit: Cellular and Molecular Biosciences (Peaks of Excellence Program)

College of Sciences & Mathematics

Cellular and Molecular Biosciences (Peaks of Excellence Program)

Expected outcome 1: Doctoral Training Program
1. Recruit high quality doctoral students from the national and international pool. Increase the number and quality of U.S. citizens in the program.

2. Students will be able to demonstrate laboratory bench skills as evaluated by the laboratory rotation faculty supervisors. They will demonstrate readiness to embark on their dissertation research by the accumulation of preliminary data that they will use to formulate their scientific hypotheses.

3. Students will demonstrate critical assessment of scientific literature through participation an interactive journal club. Students will demonstrate an ability to understand and explain the concepts, methods, results, and significance of high impact papers in their field to faculty and their graduate student peers.

4. Students will demonstrate communication skills. Students will demonstrate the ability to present clear and coherent seminars, as evaluated by faculty and peers.

Assessment Method 1: Recruitment: Annual GRA

Assessment Method Description
1. Student applications will be assessed by a combination of criteria: program fit (i.e., adequate cellular and molecular background, assessed by the number and level of cellular/molecular courses listed on the transcript); GPA, GRE scores, and statement of research/career interest/goals.

2. At the end of each lab rotation, the student’s performance will be evaluated by the faculty rotation supervisor, the director of the CMB program, and the student. The student will give a short presentation of his/her rotation, including background,
methodology, results, and significance.

3. Students will read and present two current scientific papers during the first semester (Fall) of their first year. This will be done in a formal journal club course format, attended by the course instructor, the CMB director, and all the first-year CMB fellows. Everyone will read each paper. The presentation will be assessed on accuracy and clarity.

4. Students will give short (25 minute) seminars in a seminar course format during the second semester (Spring) of their first year. The first seminar will cover the results of their first lab rotation; the second seminar will be a background and introduction to their second lab rotation; and their third seminar will cover the results of their second lab rotation. Presentations will be assessed on organization, clarity, and accessibility.

**Findings**

1. The quality of applicants improved, and the rate and quality of acceptances increased as a result of raising the stipend for the incoming class of 2012. In 2012, the top five candidates all accepted our offer; in 2013, 3 of our top 5, and 5 of our top 7 candidates accepted our offer. In 2011, 0 of our top five and only 2 of our top 10 candidates accepted our offer; and in 2010, 6 of our top 10 candidates accepted our offer. Furthermore, in 2010 and 2011 we had to make 18 and 11 offers, respectively, to fill our incoming class; in 2012 and 2013 we had to make only 6 and 7 offers, respectively. Also, in 2012 (3 out of 5) and 2013 (4 out of 5), a higher number of US students were recruited to the program. Verbal GRE scores increased significantly, while Quantitative GRE scores remained constant.
<table>
<thead>
<tr>
<th>Applicants</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of applicants</td>
<td>49</td>
<td>42</td>
<td>30</td>
<td>27</td>
</tr>
<tr>
<td>Number of offers</td>
<td>18</td>
<td>11</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>Number of acceptances</td>
<td>5</td>
<td>2</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Number of accepted students in top 5</td>
<td>3</td>
<td>0</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>Number of accepted students in top 10</td>
<td>5</td>
<td>2</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Average GPA of accepted students</td>
<td>3.60</td>
<td>NA (1 student)</td>
<td>3.62</td>
<td>3.58</td>
</tr>
<tr>
<td>Average GRE Verbal scores of accepted students</td>
<td>488.00</td>
<td>NA(1 student)</td>
<td>524.00</td>
<td>598.00</td>
</tr>
<tr>
<td>Average GRE Quantitative scores of accepted students</td>
<td>692.00</td>
<td>NA(1 student)</td>
<td>700.00</td>
<td>687.00</td>
</tr>
</tbody>
</table>

2. Students were found to perform at an acceptable (satisfactory) level, as based on the evaluation of the faculty research mentor. The evaluations were primarily subjective, and the lack of more quantitative information was seen as a weakness in the process.

3. Student presentations were found to vary in quality, as judged by the subjective evaluation of the course instructor and CMB director.

4. Student research seminars were found to vary in quality, as
judged by the subjective evaluation of the course instructor.

**How did you use findings for improvement?**

1. The findings validated the justification for raising the Fellowship stipend. The increased stipend will be maintained, and efforts will be made to increase it further, to $25,000, which appears to be the national average for competitive doctoral fellowships. We will also use these findings to expand recruitment to a wider pool of students nation-wide.

2. Findings were used to create a new, more detailed research evaluation form (attached) to more accurately determine the strengths and weaknesses of the students, and provide feedback for improvement.

3. Findings were used to create a new, more detailed presentation evaluation form (attached) to more accurately assess the strengths and weaknesses of the students, and provide feedback for improvement.

4. Findings were used to create a new, more detailed research seminar evaluation form (attached) to more accurately assess the strengths and weaknesses of the students, and provide feedback for improvement.

**Additional Comments**

None

**Expected Outcome: Summer Graduate Research Assistantship Program**

Improve the research productivity of currently enrolled graduate students by providing summer research fellowships that will give the students release from teaching assistantship duties and allow them to work full-time on their thesis/dissertation research.

1. Students should produce results sooner in their graduate career.
2. Time to graduation for these students should go down.

**Assessment Method 2: Recruitment: Summer GRA**

**Assessment Method Description**

1. Monitor student research output (i.e., presentations at scientific conferences, published abstracts, and refereed journal publications).
2. Monitor the time it takes to finish the degree.

Findings
N/A – the program is still too new to have meaningful data.

How did you use findings for improvement?
N/A – the program is still too new to have meaningful feedback.

Additional Comments
None

Expected Outcome 3: Strengthen Scientific Infrastructure
1. Improved faculty and graduate student research through the acquisition of new instruments to meet research needs

Assessment Method 1:
Assessment Method Description
1. Track the use of central core infrastructure instrumentation through use logs. Survey faculty periodically to assess what new instrumentation is needed.

Findings
1. Instruments are used heavily on a daily basis. The units that use the instruments the most are Biological Sciences (COSAM) and Physiology/Pathology (CVM). The instruments used most heavily are the Nano-drop 1000 spectrophotometers (4.5 hrs/day) and the suite of imaging instruments (6 hrs/day).
CMB funds have been used to leverage extramural funding from NSF-EPSCoR (~$4.5 M over 8 years) to acquire multiple state-of-the-art imaging systems: Laser Capture Microdissection, Multi-spectral Imaging, Gel Documentation Imaging, Laser confocal imaging system; and molecular biology instrumentation: Nano-drop 2000 spectrophotometers Upgrades from the older 1000 models), real-time PCI instrumentation.
Faculty input and responses to surveys were very sparse, but one new instrument was identified and two upgrades of existing instruments were identified.

How did you use findings for improvement?
1. Findings were used to determine which instrument upgrades were needed, and which new instruments were needed the most and where they should be placed on campus. Upgrades of the Thermo Nano-drop
spectrophotometer were performed in both the AU Research Infrastructure Facility (main campus) and at the College of Veterinary Medicine. Findings were also used to create an Equipment Committee to better evaluate instrumentation needs.

Additional Comments