Student Learning Outcomes Assessment  
Biochemistry and Molecular Biology, MS, Program  
Prepared by Kelly Drew  
June 22, 2012  

1) Data  
Data was collected from 4 BMB MS students, 3 students were in the first year and 1 student was in the third year of the program. The values below represent the percentage of these 4 students who were above, below or at the level expected for their degree in the program. In addition, faculty met to share impressions of how the program was serving the BMB MS students.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0%</td>
<td>-25%</td>
<td>25%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
</tbody>
</table>

2) Interpretation  
The graduate program assessment summary indicates that our MS students are below expected level of performance in their ability to critically analyze literature.

BMB core faculty (6) met to discuss student learning outcomes assessment and identified the following weaknesses:
  1. Weakness in advanced undergraduate biochemistry knowledge  
  2. Weakness in writing skills related to manuscripts, abstracts, posters and grants  
  3. Weakness in knowledge of principles of receptor mediated signaling  
  4. Weakness in knowledge of principles of intracellular signaling  
  5. Knowledge of professional networking  
  6. Lack of sufficient breadth in core BMB graduate courses to prepare students for research.

3) Action
- Create more opportunity to read and discuss peer-reviewed literature in 600 level courses by refocusing chemistry 450 (General Biochemistry - Macromolecules) on modules designed to prepare students for 600 level core courses
  CHEM F654—Protein Structure and Function—3 credits
  CHEM F657—Molecular Foundations of Gene Expression—3 credits
  CHEM F674—Membrane Biochemistry and Biophysics—3 credits

- Give comprehensive exam from the previous year to entering students prior to their first semester to assess improvement in advanced biochemistry knowledge and to aid advisor in placing student in chem. 450.

- Design comprehensive exam questions to assess knowledge of principles of advanced undergraduate biochemistry. Recommendations regarding placement in chem 450 would be made by admissions committee and ultimately determined by the student’s major adviser. Students may choose to audit or attend chem. 450 lectures as a means to prepare for the comprehensive exam.
  - BMB faculty strongly supported the idea of the advance biochemistry course composed of modules usually taught in the different grad courses. The modules ‘protein structure’, ‘membranes’, ‘gene expression’, and ‘cellular signaling’ would be incorporated into the advanced course. Faculty suggested that we could offer this course in the spring 2013 as a special topics course for immediate action. The advanced course would also provide the basic knowledge that students would be responsible for on the comprehensive exam. Graduate courses would apply this basic knowledge to more theoretical, research focused topics.
  - An opportunity to offer 400 level labs to complement newly designed Cell/Mol Biology, BIO 300 (O'Brien) would provide additional laboratory experience to prepare students for 600 level core courses. Laboratory experience would improve critical thinking and technical skills.

- Graduate colloquium in BMB is currently offered. Colloquium focuses on writing manuscripts, abstracts and proposals and professional networking. Consider making 4 semesters the colloquium (1 credit per semester a requirement for a BMB graduate degree.

- Special topics receptor pharmacology course will be offered spring 2013 and submitted for consideration as a graduate level course in BMB.

- Tom Kuhn has developed a course in cellular signaling. Student feedback has indicated significant demand for this course.

- Expand breadth of core requirements
  MS and PhD: choose 3 courses from the following courses
  CHEM F654—Protein Structure and Function—3 credits
  CHEM F674—Membrane Biochemistry and Biophysics—3 credits
CHEM F674—Membrane Biochemistry and Biophysics—3 credits
CHEM (TBA) —Receptor Pharmacology
CHEM F670 —Cellular & Molecular Neuroscience
CHEM F675 —Cellular Signaling (New Course)