

**Department of Biochemistry and Molecular Biology
Response to the APR Review Team's Report.
(August 13, 2016)**

Numbered sets of related comments from the APR Report and
BMB responses and action plans to address these suggestions

1. "Presently there are a variety of opportunities to foster relationships between BMB, and the Departments of Chemistry and Chemical Biology, and Biology that could create new synergies and collaborations that could benefit the educational programs of all three programs. A meeting of educational leaders from these departments is required to pursue better alignment of teaching resources and coursework."

"Presently there are not enough BMB departmental offerings to satisfy student demand for BMB courses in order to fulfill degree requirements in a timely fashion. Because of this, the BMB program is overly dependent on other A&S departments to fulfill degree electives. This in turn, is having an increasing impact on Biology, and especially the Chemistry and Chemical Biology departments, who already have trouble providing upper division courses for their own majors. In addition, if the growth in BMB enrollment remains unchecked, this will only get progressively worse. This underscores the need for the department to maintain communication and cooperation with these A&S departments, a task which is complicated by their physical and cultural separation. There is concern amongst all reviewers that the number of course offerings also lacks breadth considering the number of sub-disciplines represented by modern biochemistry and molecular biology. In particular, curriculum could be reviewed to address the lack of evolution, bioinformatics and modern "-omics" dataset analysis and production."

Responses:

-Diane Marshall (Associate Dean, Arts and Sciences) brokered a meeting between educational leaders from the departments of Biology, CCB, and BMB, in early February 2016. Though no decisions were made at that meeting, it was a hopeful beginning to promote collaborations and align teaching resources.

-In May 2016, Marcy Osgood (now serving as Director of the UG Biochemistry Program) met with CCB faculty interested in helping both BMB and CCB students have preferred access to upper-level electives in each department. This meeting led to the following proposal, which was agreed to by the BMB faculty at their June 8th Educational Retreat. The CCB faculty will now vote on the same proposal, with the goal of development of a formal MOU between departments.

Proposal: Cross-listing all of CCB and BMB upper-level biochemistry-related electives for the two sets of majors. Biochemistry majors (with 445 and 446 as prereqs) and Chemical Biology

majors (with prereqs of Chem 421 and 425) will be allowed equal access to the following courses: Chemistry 421 and 425, Chemical Biology 471 (I and II), Genome Bioinformatics; and to Biochemistry 445, 446, 463 and 464 and, with either Biochem 445 or Chem 421, AND Chem 315, to Physical Biochemistry Biochem 451.

-Dr. Osgood met with Biology faculty/leadership in July to work on a strategy to allow BMB students limited access to Biology upper level electives, with minimal disruption to Biology courses. In addition, we wish to discuss with the Biology department the addition of Biology 203 (Ecology and Evolution) to the course requirements for the BMB major, (as suggested by Associate Dean Marshall).

A meeting with CCB and Biology in early August has occurred to finalize plans across the three departments.

-The following proposals concerning increasing the number of BMB upper-level electives were agreed to at the BMB Educational Retreat June 8th:

(1.) The UG Program Director and BMB Academic Advisor will review the list of courses in other departments which are allowed as upper level elective courses for the Biochemistry major on a regular basis (yearly), and keep the list updated on the departmental website.

(2.) The department will commit to a plan to increase within-department elective offerings by two courses in the next five years, while maintaining all other current teaching responsibilities.

a) Physical Biochemistry 451 will be offered starting in Spring 2017. This will become a regular Spring elective offering.

b) The department faculty will develop a new Biochemistry upper-level elective, first named as a special topics course, later made into a permanent course.

2. "The external review team also noted a number of items that require the attention of the administration and BMB faculty. In the near term emergency resources should be provided for the effective teaching of the biochemistry laboratory (BIOC 448L) which will be taught in Spring 2016 semester to an unprecedented number of students. There is also a need to assess and modernize the equipment necessary to teach this laboratory class properly. Modernizing the present biochemistry laboratory course is also critical to the training of students within the program. This requires that commonly encountered biochemistry laboratory concepts be covered in as much depth as possible. There needs to be stability and consistency and not an *ad hoc* approach to the presentation of this important hands-on laboratory core course.

"In the short term, to mediate timely completion of the biochemistry program, a stopgap measure waiving the required laboratory course for honors students with research experience and appropriate research credit hours could be considered. In the longer term, BIOC 448L will require additional teaching faculty or staff to remain effective and address the substantially increased number of students which are moving through the program. Sections of this course should also be taught during both academic semesters to increase access and improve student throughput and therefore reduce time to degree completion since it appears to be the major

bottleneck. Inadequate teaching support to address this concern should be filled immediately by at least one of the two faculty lines previously acquired by the department. Teaching assistants (TAs) are also not available to support BMB classes, particularly larger classes and labs, and this lack of TAs needs to be revisited.”

Responses:

-In December 2015-January 2016, the BMB department submitted a pre-proposal to the Keck Foundation for funding from their Undergraduate Education Program, which specifically funds equipment purchases for laboratory and other research-based programs. The proposal made it through to the second round but was not chosen as the final (single) application from UNM. We plan to re-apply in the next round, and also search for other similar funding opportunities.

-The 448 lab course was opened up for 4 days/week (rather than 2 days/week) for Spring 2016, which accommodated all students needing the course to graduate. A half-time temporary instructor was hired for the semester.

-Karlett Parra, BMB Chair, asked for new salary funding for a full time instructor to allow the BMB dept. to offer the 448 lab course in both Fall and Spring semesters starting in Fall 2016. Dr. Roth, Dean of the School of Medicine, was positively inclined to grant this funding. However, this action item was postponed due to reductions in the FY 2017 SOM budget.

-A BMB faculty subcommittee met during May 2016 and developed the following proposals relevant to the 448 lab course, all of which were agreed to by the BMB faculty at their June 8th Education Retreat:

(1.) Review and revise the 448 course curriculum, including content and process goals, and assessments: Compare the current course curriculum to national recommendations and our programmatic priorities; Consider inexpensive (or free) but good on-line alternatives to allow students to acquire knowledge of hands-on laboratory procedures until we can afford new equipment. These alternatives would still have to live up to the revised content/process goals; Encourage (with incentives?) departmental faculty to design a new 448 module to align with above goals, etc.

Summary Proposal: Task a subcommittee to start this summer on this review/revision, with a goal to report back to the department with their suggestions in September 2016.

(2.) Develop a long-term (5 year) budget for the 448 course, with best-to-worst-case alternatives, for purchase of new equipment, recurring supplies, maintenance contracts; Determine what the current budget is, and how much money is projected to come in from student fees; Prioritize new equipment purchases for the next 1-5 years.

Summary Proposal: Gather the necessary information on current costs, lists/prices of equipment/supplies, and also projections of the departmental budget relevant to educational costs for next 5 years. Once the above curriculum subcommittee has reported on any suggested revisions, the course director should be tasked with budget management/responsibility based on all information.

(3.) Proposal: Revisit the possibility and desirability of sharing laboratory space/courses/instructor with Chemistry and/or Biology and Chem Engineering, to increase opportunities for our students to take other labs with biochemistry content, to finance new equipment, and pay for instructor salary, without incurring all the costs ourselves.

(4.) Long term plans

a. Proposal: Offer the 448 lab, in its current or revised format, in both the Fall and Spring semesters; This would require a full-time instructor position, so it is not an immediate possibility.

b. Proposal: Formally link the 448 lab to 445 and 446; students would take 448 as they take the 445/446 sequence, with lab modules temporally linked to 445/6 content; Both semesters would need to be successfully completed for 3 credits in 448; This would also require a full 2-semester commitment from a faculty member, and/or full-time instructor as above; This proposal is in line with our, and national, goals, for integration of content and skills.

-The subcommittee met again on July 26, 2016, to continue to grapple with the 448 lab course needs. There are plans in place to improve assessment opportunities, and to continue to explore ways to increase resources.

3. "There is no lower division orientation meet and greet program that allows for early contacts between faculty, staff and students before they formally interact in the classroom starting in their third year. This type of activity is likely to contribute to retention of students in the program and pave the way for early integration into undergraduate research and other departmental opportunities. There is no formal face-to-face exit interview with a departmental representative which seems like it would still be possible with the current number of graduates. The exit survey form is superficial and could be better designed to acquire information to better the program."

Responses:

-A student chapter of ASBMB has been instituted Spring 2016, with Dr. Rosenberg, BMB Faculty Advisor, as faculty leader. The student members have already begun acting as Biochemistry ambassadors at the A&S Orientation meetings for BMB majors.

-Drs. Osgood and Rosenberg have agreed to revise the BMB majors exit survey and work with the A&S Assessment Director to design an exit interview for Spring 2017. These will occur in conjunction with the revision of the BMB Department Assessment Plan (Dr. Osgood will take the lead on this, with a completion date of September 2016 planned.)

4. "There is a trend around the country to provide research experiences to all STEM majors. There are opportunities in the BMB department with appropriate resources to design a laboratory course as an authentic research experience. Examples of this exist in STEM educational literature."

Responses:

-During the BMB departments' preparation of the pre-proposal for the Keck grant, groups of faculty met to develop an innovative curriculum that would introduce our students to a variety of authentic research experiences, which would take advantage of the faculty expertise and the resources available at the HSC and in New Mexico in general. One of the goals of the 448 Curriculum Subcommittee (mentioned above) will be to integrate some of these ideas (those that do NOT require extensive new resources) into the revisions for the 448 course.

-In addition, at the June 8th Education Retreat, the BMB faculty agreed to the following proposals:

A. Develop local and national connections for summer internships

B. Help BMB students find honors lab openings and/or lab jobs, and increase research opportunities for our students overall; develop/maintain good relationships with lab mentors in other depts. (HSC and main campus), including, but not limited to: sending thank-you notes after each student experience, inviting mentors to Research Day and also BMB graduation; publish (on BMB website) a list of lab openings, and a "primer" of procedures for finding and entering a research lab; invite 446 students to Spring Research Day presentations (hold the Research Day in the 446 classroom); Present (in 445) a "research experience overview"; give BMB faculty some small teaching FTE credit for mentoring an UG research honors student; hold a yearly review (by UG program director, research concierge, shared with mentors) of 497, 498, 499 course evaluations; allocate a small amount of departmental funding to UG research students (for research supplies, for example); Return to idea of research honors counting towards 448 credit (need to be sure of credit hours, etc)

Summary Proposal:

Create a Research Concierge position within the department, and give educational FTE credit for it. This Concierge will take the lead on the above activities, with the help of everyone in the department.

5. "The morale of some faculty within the department is low. We believe that this is due to recent retirements and the resulting rearrangement of teaching loads in combination with a perceived increased expectation of grant success. Furthermore, it is our understanding that departmental changes implemented have occurred at a relatively rapid pace which may have been disruptive. A departmental retreat may contribute to departmental cohesiveness."

Responses:

-The department met on June 8th, 2016, to address several of the APR report's most immediate concerns. The results of this retreat have been outlined above.

6. "A biochemistry departmental representative (i.e. Chair or faculty member) should therefore interact regularly with the A&S administration and other relevant A&S departments and chairs to reduce possible duplication of efforts and to become

aware of opportunities available to undergraduate programs from the main campus (e.g. internal teaching equipment grants or timely application to acquire course fees to support program).”

Responses:

-Dr. Osgood will continue to meet with other departments to try and improve communication “across Lomas”. She will be invited to the monthly A&S program directors’ meeting.

7. “This and/or other efforts should be made to improve effective communication between the Chair and faculty. Given that the department is going through a stressful period, actively practicing empathy and providing transparency in decision making processes should help ameliorate negative feelings. This may be further aggravated by repetitive teaching which could lead to burnout. The underutilization of sabbaticals for whatever reason may also contribute to low morale.

“The review team is also in agreement with the ASBMB accreditation feedback that identifies a serious deficiency in BMB senior biochemistry faculty members. Increasing the numbers of senior faculty would improve overall experience and mentorship available to junior faculty.

“The administration of both involved colleges should foster open lines of communication to increase their knowledge of the BMB undergraduate program and make a concerted effort to see it is appropriately supported. For instance, greater transparency regarding funding for the BMB undergraduate program is required, which might provide clarity of the financial commitment of A&S to the program. The planned outcome assessment in the form of an ASBMB certification exam (formerly an ACS exam) is viewed positively and should be supported by A&S and other University entities. There is a lack of program accountability to A&S, and the college is not presently involved in program direction, assessment or evaluation of instruction.

“The program appears to lack a definitive administrative champion and the administrative structure appears overcomplicated. In order to determine the best structure for the program (which may be the existing one), and in the best interest of the students, a neutral committee of HSC and A&S representatives headed by the Provosts office should be formed and tasked with determining the best institutional placement of the biochemistry undergraduate program and its resources. There are clearly benefits to the program being housed in either the HSC or Arts and Sciences alone.”

Responses:

-These concerns cannot be addressed solely by the BMB department, though we will continue to strive to improve communication between A&S and the HSC over time.