

External Evaluation  
University of New Mexico  
Bachelors in Biochemistry  
(11/16/15-11/17/15).

The external review team greatly enjoyed the opportunity to examine the undergraduate biochemistry program and Biochemistry and Molecular Biology (BMB) department. The external review team also salutes the University and BMB department for undertaking this review which is timely given the increasing growth of the biochemistry undergraduate program and the lack of past reviews. Thanks go out to the fantastic group of concerned administrators, faculty, staff and students that we met with during our visit. All BMB faculty are also to be commended for their candor and openness in discussion of their program with the review committee. All of the BMB faculty involved with undergraduate teaching that we met were passionate about providing lectures and supporting undergraduate research experiences within the biochemistry program. The students were enthusiastic, thoughtful and engaged and it was clear that they are important assets to the program. It is our hope that this report will aid in identification of the many positive aspects of the program worthy of continued support as well as the problems which require attention.

The undergraduate Biochemistry program has had a long and successful association with the HSC (undergraduate teaching since 1969; undergraduate major since 1984). This association is important to students who are considering postgraduate health-related programs and biochemistry majors. They take pride being in or near the environment of the medical school. The Health Sciences Center also offers several important resources, including impressive core facilities which could be used to improve the laboratory training provided to biochemistry majors as well as, provide these students with supervised research experiences.

The Department of BMB Chair, Dr. Karlett Parra, is dedicated to improving the undergraduate biochemistry program and is working hard to increase stature of the Department locally and internationally. Her support for the undergraduate biochemistry program is demonstrated by her recent successful procurement of funds (from the HSC administration) to renovate a new undergraduate laboratory teaching space. Dr. Parra has also shown a willingness to be open, self-critical and the committee feels that she will seek advice when required. Dr. Parra also wishes to lead by example, and intends to hold herself to the same high standards as those expected of research intensive BMB faculty. She is also very knowledgeable of and thoughtful about the Health Sciences Center (HSC) and departmental promotion and tenure procedures.

The highest levels of the HSC administration are also determined to continue support for the BMB education mission, including their support for the promotion of teaching-focused faculty. Clearly, the promotion and tenure documents reviewed by the external review team support teaching excellence as a component for successful tenure and promotion within the HSC. The HSC administration has also provided space for a small undergraduate teaching laboratory and funds required to modernize this space. They have also acknowledged the need for additional teaching-related resources for the biochemistry undergraduate program.

External Evaluation  
University of New Mexico  
Bachelors in Biochemistry  
(11/16/15-11/17/15).

Collectively, these efforts represent a significant commitment to the ongoing restructuring of the BMB teaching program.

BMB is committed to undergraduate education and has two tenure-track biochemistry teaching professionals with primary interests in developing innovative teaching techniques and educational research. BMB has tenured and promoted one of these faculty to Associate Professor and the other teaching faculty member is currently an Assistant Professor.

The BMB department has a reputation on campus for excellence in their undergraduate teaching mission which in turn contributes to the ongoing marked growth of the program. Students attracted to the Biochemistry major on average have high GPAs and the BMB department is doing an excellent job in graduating these students in a timely manner, including a substantial number of minority and non-traditional students. The BMB department also provides an essential non-majors biochemistry course that supports multiple science programs as well as the acclaimed BA/MD program. It is clear from our conversations with BMB students that they appreciate the human and disease-related emphasis of the current BMB course offerings. So successful is the biochemistry undergraduate program that in June 2015 the program was accredited by the American Society for Biochemistry and Molecular Biology (ASBMB). ASBMB has noted the following positive points about the BMB biochemistry program in their report which the external review team agrees with:

1. Very strong inquiry-based, student centered teaching;
2. Use and availability of classrooms designed for inquiry-based teaching and collaboration;
3. Support for a very diverse student body; and
4. Attention to assessment at course and program level.

Indeed, we have observed this inquiry-based learning underway as part of our review process and were duly impressed. With the limited means currently available due to retirements, the existing faculty is trying to increase badly needed elective offerings in the department and there is an effort afoot to reinstate a Physical Biochemistry course. Another positive development is that Dr. Marcy Osgood will be reassuming her former post in charge of undergraduate biochemistry education within the department.

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.

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

External Evaluation  
University of New Mexico  
Bachelors in Biochemistry  
(11/16/15-11/17/15).

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.

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.

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.

External Evaluation  
University of New Mexico  
Bachelors in Biochemistry  
(11/16/15-11/17/15).

The exit survey form is superficial and could be better designed to acquire information to better the program.

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.

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. 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. 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).

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

External Evaluation

University of New Mexico

Bachelors in Biochemistry

(11/16/15-11/17/15).

clearly benefits to the program being housed in either the HSC or Arts and Sciences alone.

11/28/15

John. E. Gustafson

Professor and Department Head

Department of Biochemistry and Molecular Biology

Oklahoma State University

Eric S. (Sam) Loker

Distinguished Professor, Curator and Director.

Department of Biology

University of New Mexico

David Wilson

Professor

Department of Molecular and Cellular Biology

University of California Davis