

Department of Microbiology Program Review

Dean's Response

June 23, 2008

The mission of the College of Science states:

The College of Science provides quality education in the natural sciences and mathematics. The college offers majors and minors in seven departments (Botany, Chemistry, Geosciences, Mathematics, Microbiology, Physics, and Zoology). The college also supports students through its Developmental Mathematics Program. The departments and programs of the College of Science support professional and graduate school preparatory programs, and contribute significantly to the general education of students by improving scientific understanding of the natural world and quantitative literacy. Education is provided through formal classes, laboratory and field experiences, and undergraduate research projects. Student learning is also supported by departmental clubs and professional preparatory organizations. The college promotes science and mathematics teaching through the Center for Science and Mathematics Education, and community outreach through such facilities as the Layton P. Ott Planetarium and Museum of Natural Science.

The programs in the Department of Microbiology are designed to contribute to the overall mission of the College of Science by providing general education courses, support courses for other programs, and major programs that prepare students for employment or further education.

The program review team noted a number of strengths in the current program: (1) the department has “extraordinarily talented faculty whose diverse expertise and combined energy are largely responsible for the strength and achievements of the Microbiology program”; (2) a commitment to program assessment; (3) the program consistently ranks first or second in the college in numbers of graduates; and (4) the department “has a long and distinguished record of undergraduate research”.

The Dean agrees with the determinations of the program review team with regard to identified strengths of the Department of Microbiology. The program certainly has a strong core of faculty who work closely with students on undergraduate research projects. In addition, the program is also fortunate to have two gifted and dedicated staff members that effectively support the efforts of the faculty and students. It is certainly due to the work of the faculty and staff, combined with an increasing need for graduates trained in microbiology that the numbers of graduates in the program have steadily increased over the past decade to the point where

Microbiology has at times in the past few years produced the largest number of majors in the College of Science.

Along with its strengths, the review team identified a number of challenges for the programs in the Department of Microbiology: (1) the review team was particularly concerned about the low number of faculty in the program, particularly in light of the number of major graduates; (2) overall funding for the program is inadequate, including support for expendable supplies, conference participation or training, and laboratory equipment; (3) “laboratory space in the Department of Microbiology is now in very short supply”; and (4) the need to “give faculty load credit for laboratory contact hours and undergraduate research time”.

Again, the Dean believes that the review team has done a good job of identifying significant challenges that should be addressed by the Department of Microbiology as it continues to move forward and strengthen its program over the next five years.

The review team correctly points out that the numbers of majors has generally been rising in recent years. In fact, going back roughly 11 years, the number of majors has increased by about fifty percent during that period. On the other hand, the number of student credit hours rose slightly over that same period, peaking in 2003 – 2004, but has been declining fairly steadily since the high point. Similar patterns in SCH production are being seen in other departments in the College of Science as well, due largely to a decrease in enrollments in general education offerings.

In order to help encourage increases in the numbers of majors in all programs as well as address the declining SCH issue, the College of Science has a very active publicity and recruitment committee with representation from every department in the College. The College’s general advisor also supports the publicity and recruitment activities of the committee. The committee has recently revised recruitment materials that are provided to the recruitment office and assisted in updating our departmental and college web pages. In addition, a monthly College of Science E-Newsletter is published out of the Dean’s office which features one department or program in each issue, along with special announcements.

The College of Science Chairs’ Council also began a conversation this past spring about developing new and inviting general education offerings that meet the recently revised and adopted Life Science and Physical Science general education goals and criteria. This conversation will continue into this fall and will integrate with the campus-wide conversation regarding general education assessment. It is of paramount importance that graduates of Weber State University develop a significantly deeper understanding of and appreciation for science and mathematics, and that the number of students majoring in the sciences and mathematics increase. Of course this is not simply a Weber State University issue, but it reflects national trends. As documented in countless state and national reports, the low level of understanding and expertise in STEM fields (Science, Technology, Engineering, and Mathematics) is at a crisis level for

United States in terms of maintaining a competitive advantage in the world economically, technologically, and scientifically.

The concern that the review team raised regarding the need for increased financial support is also certainly appropriate. This is an issue across all departments in the College. It is an especially difficult problem for those departments with significant costs in expendable supplies, such as chemicals and reagent kits. The review team also specifically noted funds available for travel and training as being an issue. While it is certainly true that allocated funding for these needs are “woeful”, the departments in the College of Science are given the flexibility to use departmental funds as deemed most appropriate, including for travel, by reallocating funds within subaccounts as necessary. In addition, Weber State provides opportunities to obtain internal grant funding to also support travel in many cases. The entire issue of ongoing funding in all areas for departments is a continual challenge for the College and one that the College continues to examine carefully.

The need for the acquisition of laboratory equipment is also a significant and ongoing concern for the entire College of Science. Needless to say, E&G funding is far too limited to be able to support the many, expensive pieces of equipment that are required of modern laboratory programs in the life and physical sciences. However, significant progress has been made in this area in the past couple of years, and it continues to be a point of major focus for the College collectively. Instruments that has been, or are about to be, purchased since last year that are specifically dedicated to the Department of Microbiology include a spectrometer that can read 96 well plates simultaneously, and a phase-contrast microscope with a digital camera (the combined cost of the two instruments is approximately \$48,000). In addition, other significant pieces of equipment that are being obtained by the College that may have occasional application for the Department of Microbiology include (a) a 90 MHz FT-NMR, (b) a gas chromatograph/mass spectrometer, and (c) an environmental scanning electron microscope with an energy dispersive X-Ray spectrometer. The total cost of these important instruments total more than \$400,000. In addition, a 132 node supercomputer cluster is also available for the entire College of Science, valued at roughly \$250,000. Although significant purchases have been made thanks to a significant private donation, a grant from the George S. and Dolores Doré Eccles Foundation, special one-time funding from the Provost’s office, support from the Hemingway Trustees, a NASA grant, and funding through the College of Science, it is not anticipated that this level of funding can be provided routinely. It is imperative that departments search for other funding sources, including significantly increased grant writing and perhaps increases in student fees for its laboratory programs.

While major grant writing is strongly encouraged within the College of Science, such activity requires a significant commitment on the part of the departmental faculty, combined with appropriate support from the College and the University. With a growing focus on obtaining external funding, the University has just completed a search for a new director of the Office of the Sponsored Projects. It is anticipated that the hiring of the new director will enhance the

support provided to grant writers in the College of Science and across the campus. The College of Science Chairs Council has also discussed the possibility of hiring an individual, or creating an Associate Dean or an Assistant to the Dean position, that will support Principle Investigators with grant writing and post-award support. This decision is pending, based on the future direction and support of the Office of Sponsored Projects.

In addition, the Chairs' Council has determined that it is important to support a College of Science information technology specialist. Although this individual will have significant responsibility for support of the geographic information systems laboratory in Geosciences and the 132-node supercomputer in Physics, the individual will also be available to support IT needs across all of the departments in the College of Science. A committee has been organized to conduct the search that reflects the interdisciplinary requirements of the position, with the expectation that a person will be hired during Fall Semester, 2008.

As the review team also pointed out, severe space limitations exist in the Department of Microbiology. This is also true throughout the College of Science, and is negatively impacting all departments. The Science Laboratory building is now nearly 40 years old (completed in 1969) and the adjacent Lind Lecture Hall is only one year younger. The design and current status of the Science Lab building is highly restrictive to collaborative projects and suffers from significant fire, earthquake, and asbestos issues. However, more immediately, there is no available space in the building for expansion of programs, or for necessary support of research by faculty and students. Efforts are continually underway to identify temporary and long-term solutions to the challenging space constraints that the College of Science currently operates under.

Finally, the review team also pointed out the need to "give faculty load credit for laboratory contact hours and undergraduate research time". The College of Science Chairs' Council has been discussing the issue of necessary time for research and scholarship, particularly as it applies to undergraduate research, and plans to revisit the issue in a more focused way during Fall Semester, 2008. The issue is becoming increasingly important to the entire college given (a) the rapid growth in undergraduate research, (b) the very conservative policy of providing 0.25 TCH per SCH, which is far too restrictive for the time-intensive mentoring required of undergraduate research, and (c) the importance of supporting active research programs for faculty interested in remaining current in their disciplines, which is a fundamental requirement of excellent teaching, especially in rapidly developing disciplines. The Dean anticipates that a formal policy regarding reassigned time for research and scholarship activities will emerge from this fall's discussion.

The Dean greatly appreciates the thoughtful self-study developed by the Department of Microbiology, the numerous informed comments made by the program review team, and the reflective response by the Department. Many of the concerns and recommendations suggested by the review team are already being addressed, but the recommendations will also certainly be very helpful in strategically planning for the next five years of the program.