

## **2008 Program Review for the Weber State University Department of Microbiology**

The Department of Microbiology at Weber State University is a unique and extraordinarily valuable asset to Utah's System for Higher Education. Each year, the program ranks as first or second in the College of Science for numbers of graduates, and the quality of these students is truly remarkable; a Microbiology degree from WSU is a recognized and respected springboard for entry into medical or dental school or into an MS and PhD graduate program. Just as importantly, students with more immediate career aspirations are virtually assured of placement with local industry in good-paying jobs that provide fuel to Utah's economic prosperity.

The achievement of the Department of Microbiology in annually producing a relatively large and prized pool of graduates is neither fleeting nor the result of happenstance. Greatness in academics, administration, or business requires, at minimum, having passionate and disciplined leadership, the right expertise –and experts- on your team, effective tools to assess progress, and the resources and patience to realize your mission. The greatness that has been exemplified by the Department of Microbiology for many years flows from the effective and talented leadership of its Chair, Dr. Craig Oberg. Quite simply, Dr. Oberg brings the knowledge, vision, passion, and discipline that the faculty and Department need to succeed. Of course, Dr. Oberg is clearly fortunate to have on his team an extraordinarily talented faculty whose diverse expertise and combined energy are largely responsible for the strength and achievements of the Microbiology program. The collegiality and sense of teamwork that is clearly manifest among the faculty is an uncommon and remarkable strength of the program, and serves to illustrate the loyalty that exists among faculty toward the Chair, the department, the students, and one another. The committee applauds the faculty for their teamwork, effort, and clear dedication to the students and the program.

The success that the Department of Microbiology enjoys in its growing student enrollment and remarkable post-graduate placement rates are a clear reflection of its long-term interest in ensuring the program addresses the needs of its constituents. The Microbiology program has an effective and appropriate mission statement that reflects this goal, and it has implemented student learning outcomes assessment for nearly a decade. The committee found that the Department continues to employ a variety of tools to assess -and respond to- the changing needs of students, employers, and the program. One outcome of these efforts has been that the Microbiology Department has developed and maintained good working relationships with a number of local companies. These relationships have created opportunities for student internships, created new courses to meet specific industry needs, generated gifts to the Department and (of course) created opportunities for post-graduate student employment. The committee agrees that these efforts are vital to program success and applauds the faculty for its commitment to program assessment.

Although morale among the faculty and staff is good, there is a clear sense that the program's ability to sustain its current high standard of productivity faces very serious and immediate challenges. In the last review, the committee noted that departmental resources were grossly inadequate in several areas, most notably in regards to the low number of faculty, support for faculty professional development, and in space and equipment needs for teaching and research. Unfortunately, it is the determination of this committee that each of these challenges continues today.

Although the Microbiology program consistently ranks as first or second in the College of Science for numbers of graduates, the department continues to host one of smallest number (6 on-campus, 4 adjunct) of faculty in the College. After the last review, one faculty position was added, but replacement of that position is currently on hold. Hence, there has been no net change in faculty numbers. Moreover, the Department shows a heavy and disproportionate reliance on adjunct faculty. The committee understands that these adjunct faculty bring great value to the program, but their service to the department does not equal that of an on-campus appointment, and a disproportionate reliance on adjunct faculty makes the program more vulnerable to unforeseeable vacancies and serious program disruption.

The combination of a low number of on-campus faculty with high program enrollment translates into greater teaching loads (in both traditional and extracurricular settings) and fewer opportunities for professional development among the faculty. Faculty availability for extracurricular instruction, which is most commonly delivered in the form of one-on-one undergraduate research mentoring, becomes especially problematic. The importance of integrating undergraduate research experience into the curriculum has garnered nationwide attention, and has recently been identified as an institutional priority at WSU. The Department of Microbiology has a long and distinguished record of undergraduate research. However, growing demand within the Department for these opportunities (in recent years, undergraduate research experience has become virtually essential for entry into medical, dental, or graduate school) combined with a very limited pool of internal resources to support it and an institutional infrastructure that does not yet fully recognize –or reward- the effort it requires, places the faculty of Microbiology in a position where their efforts to sustain a very high standard of student education are becoming incrementally more difficult to realize. Without additional on-campus faculty, the committee strongly believes it will soon become impossible.

Faculty excellence in the classroom also requires opportunity for professional development. Like all disciplines in the life sciences, microbiology is experiencing an exciting and unprecedented rate of advancement. In the face of constant change, faculty that remain current in their expertise are able to provide more effective mentorship and training that help students land jobs or secure post-graduate education. The committee's discussions revealed that the campus library does provide access to journals and other services that meet the needs of the Microbiology faculty. However, institutional support for conference participation or training is truly woeful; while Microbiology receives only \$2000 in total each year for this purpose, faculty in some WSU departments are awarded more than \$1000 individually, and can carry this balance forward at year's end. It is the experience of this committee that even the latter figure is too low for faculty to remain current in microbiology. Fortunately for the Department, Dr. Oberg's research and consulting efforts have provided him with a small pool of unrestricted extramural funds, and he has been generous in his support of faculty professional development with these accounts. The committee applauds Dr. Oberg's leadership and mentoring efforts, but notes (to the college) that continued reliance on these resources -like adjunct faculty- may undermine the foundations of a strong program because unforeseeable events can cause them to evaporate overnight.

Sabbatical leave is another important tool in faculty professional development, and WSU has a good sabbatical program. Unfortunately, heavy teaching loads in the Department of Microbiology still serve to deter faculty members from reaping the full benefits of this policy because of the strain that is created by a member's absence. Once again, unless additional on-campus faculty are hired, the ability of existing faculty to advance in their profession will continue to be handicapped. This outcome will invariably diminish the quality of student education and training and is also likely to have a negative effect on faculty satisfaction at WSU.

The committee recognizes that resources allotted within the College, including faculty lines and operating budgets, are reflected in large measure by institutional allocations for the student contact hours (SCHs) generated within each department in the college. Thus, General Education and other service courses that generate large SCH numbers are clearly important to stability in college budgets. Historically, the Department of Microbiology generated large SCH numbers through service courses, but changes in Gen Ed course offerings, particularly the introduction of a new Nutrition course, have reduced student enrollment in Micro courses. At the same time, enrollment in courses for the major has experienced an increase. In response to these changes, the Department has sought to increase the number of off-campus and online Gen Ed course offerings, and has also increased the frequency of major course offerings. The committee applauds these efforts as plausible and logical means to address student enrollment challenges, but also notes its concern that both moves result in a much greater strain to operating budgets and a greater dependency on adjunct faculty. As a result, the potential for success of these endeavors is diminished. Once again, allocation of additional faculty lines to the Department would provide the Department with the flexibility it needs to adapt to enrollment needs, and better assure the long-term security of the Department and the College.

Efforts to increase course offerings within the major are also compounded by a limitation on teaching space and laboratory equipment. Coursework within the major typically involves parallel laboratory training and because microorganisms grow on their own schedule, labs cannot be scheduled on a Monday or Friday without a requirement for weekend work. Because of this simple reality, laboratory space in the Department of Microbiology is now in very short supply and options to accommodate increasing laboratory enrollments have begun to disappear. Limitations in laboratory space and equipment also have a detrimental effect on the Department's ability to offer meaningful undergraduate research experiences. As a result, increasing laboratory space was identified as the Department's top priority in the self-study. The committee understands that providing additional laboratory space poses a serious challenge to the college, but believes that the impact of Microbiology graduates on local and State economies –and the recognition they bring to WSU- justifies greater efforts to grow this program.

Another challenge to modern instruction in microbiology is that it embodies a significant element of molecular biology, and laboratory instruction in molecular biology often requires sophisticated and relatively expensive support. Students and faculty expressed concerns to the committee about the value of training experiences gleaned from outdated laboratory experiments and equipment. On a positive note, the department has been able to periodically acquire important pieces of equipment from generous industry donors, many of whom also contribute laboratory reagents and supplies the Department cannot afford. These accomplishments serve as testament to the creativity and resourcefulness of the faculty and the laboratory manager, Lynn

Moyes, and the committee commends them for these achievements. However, there are still numerous equipment and supply needs that must still be addressed, and the committee is compelled to note (once again, to the college) that continued reliance on outside resources to support a core departmental –and college- responsibility will eventually undermine the foundations of what is, and has been for many years, a very strong degree program.

In summary, the Microbiology Department continues to attain an exceptionally high standard of quality in undergraduate education. The faculty are an outstanding group of over-achievers who work very hard to address the needs of their students and the Department. Their efforts are rewarded by a reputation for student commitment and post-graduate opportunities that continue to drive high student enrollment in the degree program. The achievements of the Microbiology Department are especially noteworthy in light of the fact that institutional support for its core activities has often been inadequate. The committee commends the Department chair, faculty, and staff for their creativity and resourcefulness in overcoming these limitations for many years. It would be unrealistic, however, to expect the Department to perpetuate such a high standard indefinitely in the absence of greater institutional support.

The committee is especially concerned that current reliance by the Microbiology Department on adjunct faculty, donated lab supplies, and external funds for teaching and faculty development have made it vulnerable to a “Perfect Storm,” wherein these resources could disappear with little warning and cripple the remarkable efforts of this faculty and this program. We strongly encourage WSU administrators to take immediate action to better safeguard the security and vitality of this valuable department. Our specific recommendations to ensure program vitality and keep the department at the level expected from peer institutions are as follows:

1. Reallocate basic resources: As was recommended by the last review team, there is a strong and immediate need for reallocation within the College of Science to address chronic shortfalls in faculty numbers, faculty support, and in the space, equipment, and supplies needs for teaching and research. The microbiology annual supply budget is simply not adequate to support this kind of laboratory-based science due to the consumables required and equipment.
2. Give faculty load credit for laboratory contact hours and undergraduate research time: This faculty-student interaction time is rich in value for the College and the institution. There is a national surge in recognizing lab time as contact time, and WSU should be moving in this direction. At present, one-third of college/university campuses give 1:1 contact hours for lab, and another third give 0.75:1 for lab (CUR 2002 study). Undergraduate research load time models are also available. Valuing faculty time results in prolific work and increased student outcomes.
3. Reinstate the frozen faculty position and add one position: The committee is cognizant that the decrease in Gen Ed enrollment in the Department of Microbiology has resulted in the “freezing” of a faculty position and understands the rationale behind this action. However, we firmly believe that the Department has introduced sound measures to grow enrollment, and it must be provided with additional resources (including at least two new on-campus faculty lines) to ensure these measures will succeed and for the department to continue to realize its own high standards.

Finally, We wish to specifically endorse the Department's efforts to grow enrollment in the major. Service courses have obvious purpose and value, but majors contribute the identity to a department and college. They are the stars whose success serves to proselytize to the community at large the strengths and achievements of the department and the college. Gen Ed students play a supportive role, but they draw little attention –or resources- to the college after they leave. We strongly encourage the Dean to reflect on the identity of the College of Science, and suggest that it should lie parallel to that embodied by the Department of Microbiology.

April 7, 2008

Report submitted by:

Dr. Jeff R. Broadbent, committee chair  
Associate Vice President for Research  
Utah State University, Logan

Dr. Bonnie Baxter  
Associate Professor of Biology  
Westminster College, Salt Lake City

Dr. Gene Sessions  
Professor of History  
Weber State University

Dr. Yas Simonian  
Professor of Clinical Laboratory Science  
Weber State University