

Microbiology

A department in the College of Natural Resources and the Environment offering the B.A. and B.S. in Medical Technology, and the B.A., B.S., M.S., and Ph.D. in Microbiology.

■ The Review Process

This was a standard AQAD review. Reviewers were:

Peter Setlow (University of Connecticut Health Center)

Lily Y. Young (Rutgers, the State University)

Stephen Zinder (Cornell University)

■ Main Issues

The visiting team noted that UMass Amherst is “fortunate to have a sound core of microbiologists” given the renewed importance of the field. Overall, the department was found to have “a strong undergraduate teaching program, a bona fide research star, a core of new young faculty,” and to be “poised to achieve excellence.” The team also expressed the view, however, that reaching excellence will require changes in departmental leadership and in the physical and financial resources available to the department. The team made a number of specific observations and recommendations, many reflecting issues raised in the department’s self-study:

- **Infrastructure.** The team saw the department’s single location and proximity to certain other departments and research facilities to be an advantage. Some “excellent space” exists on the fourth floor of Morrill Science Center IV, renovated for Prof. Lovley’s research program. The team noted, however, that “the contrast between the 4th floor and the other Department space is extreme,” and that “the condition of the great majority of the Department space is extremely poor.” In the team’s view this “severely and negatively affects the ability of the Department to recruit faculty and graduate students,” and also raises concerns about the retention of junior faculty. Space for graduate students was found to be inadequate, “undoubtedly one element in the relatively low morale” of graduate students. Undergraduate teaching labs were found to be in “poor condition,” with absence of dedicated space for computers said to be a “particular deficiency.” The team also expressed concern about the amount, as well as the condition, of the department’s space. The team noted that the department has seven assistant professors, each with the expectation of establishing successful research programs, but that if these faculty are successful they will “need and want more space.” The department was urged to make plans for this eventuality soon. The team also noted that “a good bit of the equipment in the teaching labs is outdated and/or beyond its useful life.”
- **Undergraduate program.** The team found the undergraduate program to be “healthy and well received,” and noted that course evaluations for the Microbiology faculty were generally “strong and above average.” The team singled out as a strength the “substantive laboratory experience” available to undergraduates, and cited as “astounding” the “fact that 60-70% of the undergraduates gain research experience working in a faculty lab.” The team noted that a strong recruitment effort several years ago had resulted in a doubling of undergraduate majors. That enrollment surge had “generated some difficulties in terms of oversubscribed

labs, scheduling issues and the ability of the undergraduates to take the courses needed for graduation,” and recruiting had therefore been curtailed to allow enrollments to return to a more traditional and manageable level. From this, however, the team concluded that “there is much stronger interest in the major” than is indicated by current enrollment, and that with “a little effort at outreach, the student census can be readily doubled.”

- **Graduate program.** The team saw as a strength the ability of the department to provide TA support to nearly all graduate students. At the same time, the team found that graduate stipends are “low compared to other graduate programs” and “not competitive with sister institutions.” The team reported encountering a “feeling of insecurity and uncertainty” among graduate students that “contributed to low morale.” The team attributed this in part to stipend issues, and also mentioned that some students expressed disappointment that expectations when entering the program had not been met. The team recommended “more transparency” in the operation of the graduate program and more involvement by graduate students. The team reported being “struck by the fact that an untenured assistant professor is the graduate program director,” and recommend that this responsibility be shifted to a more senior faculty member. The team also noted a desire on the part of graduate students for more “graduate-only” courses, vs. courses shared with upper division undergraduates.
- **Faculty.** The team noted as “encouraging” that 6 of the 11 faculty members in the department are “young assistant professors who bring much energy and enthusiasm to the program.” The department’s work in environmental microbiology was an “identified strength” under the leadership of Prof. Lovley, a “research superstar.” Interdisciplinary work with such areas as Geosciences, Environmental Engineering, and Polymer Science was praised. The team also noted, however, that the “bottom-heavy” faculty distribution has had “numerous repercussions,” including “the shouldering of unusual responsibilities by junior faculty.” The team acknowledged that some of these issues will resolve over time, but in the meantime suggested minimizing the burden on junior faculty as much as possible. Toward this end, the team recommended that consideration be given to hiring a more senior faculty member in an upcoming search. The team also recommended establishment of more formal mentoring opportunities for junior faculty, perhaps drawing on senior faculty from other departments or institutions.

The team noted that the faculty are generally oriented either to environmental microbiology or medical microbiology. In the team’s view, the latter is an area of emerging importance, and underpins much of the undergraduate program. The team found that the “two excellent young faculty members” in this area are “stretched thin ... and there is concern that they are below the critical mass needed to keep the program successful.” The team recommended the addition of one or two positions in this area, but also noted that the presence of several immunologists in other departments created opportunities for cooperation.

In terms of departmental leadership, the team saw a clear need for a chair “who has sufficient clout and who can devote the time necessary to moving this department forward to excellence,” and expressed the view that “hiring a chair from the outside is an appropriate strategy.” The team cautioned, however, that “to entice a Chair to lead a department with serious problems in demographics and facilities, guarantees of significant university resources will be needed.”

■ Results of the Review

The department expressed general agreement with the team's recommendations in the areas of facilities, departmental leadership, faculty growth and mentoring and support for junior faculty. The department reported that facilities renovation plans are underway, that a faculty mentoring program is being organized, and that a more senior faculty member has been named graduate program director. Issues related to graduate stipends, the number of graduate-level courses, and the modernization of teaching lab equipment were also acknowledged, and several possible funding strategies were discussed.

The Dean found that the team was “generally on the mark” in its assessment, and reported on a number of steps putting the department on an “upward trajectory ... much advanced from the department that the AQAD review team visited.” A plan to renovate space on the first three floors of Morrill IV is moving forward, and the construction of the new Integrated Science Building may provide access to state-of-the-art teaching laboratories. Medical microbiology positions are targeted in faculty hiring plans, and efforts to hire an outside department head continue, with the Dean expressing confidence that the position will be attractive to a high-quality researcher. The Dean encouraged the department to develop a mentoring system for junior faculty. On the question of graduate student stipends, the Dean noted that some departments limit the number of supported positions so as to permit somewhat higher stipends, and also support higher stipend through fundraising. The dean endorsed the idea of greater involvement of graduate students, and also noted that the number of graduate-level courses should be able to increase given faculty hiring in the department.