

## Biology

A department in the College of Natural Sciences and Mathematics offering the B.A., B.S., and M.S. in Biology. Doctoral students in Biology earn degrees through one of several interdisciplinary graduate programs.

### ■ The Review Process

This was a standard AQAD review. The review team made overall comments on graduate education; the interdisciplinary graduate programs in which the department participates will be separately reviewed in 2007-08. Reviewers were:

Paul Licht, chair (University of California, Berkeley)  
Mary Clutter (formerly NSF Biology Directorate)  
Fred Dyer (Michigan State University)  
Sue Wick (University of Minnesota, Minneapolis-St. Paul)

### ■ Main Issues

The visiting team took as a central focus the question, “what defines the Biology department” in a large university in which biology is studied and practiced in many different departments and programs, and how can the department’s mission be integrated with those of the other units? The team concluded that “the Biology Department is clearly the one department in a position to serve as the ‘hub’ for the study of biology on campus,” and detailed several strengths and weaknesses related to that role. Strengths included the department’s “critical” role in teaching undergraduate biology, especially from an integrated perspective for which the department was found to be “exceptionally well positioned;” the centrality of the department to the interdisciplinary life sciences graduate programs; its capacity to play a central role in interdisciplinary research; and a coherent grouping of faculty into research clusters with critical mass in key areas. The principal weaknesses identified were a shortage of faculty given the demands of a broad undergraduate curriculum and vigorous research programs, and concerns regarding departmental focus. The latter included weak rationales for the research clusters, over-reliance on existing clusters (vs. intersections of clusters) in planning future faculty hiring, and a “perplexing” lack of emphasis on ecology. The team recommended increasing the size of the faculty by at least five, designing the hiring program to “foster connections among clusters,” and finding a way to integrate ecology into the department or define it within the institution.

The team made separate findings and recommendations in four areas:

- **Undergraduate programs.** The team praised the department’s diverse curriculum, with special mention of efforts to maintain strength in organismal and evolutionary biology. Service instruction to students in other departments that “rely absolutely” on Biology was cited as a strength, as was a faculty “engaged and committed” to undergraduate teaching. This commitment was reflected in curricular innovation, special opportunities for undergraduates, numerous teaching awards and leadership efforts, and a generally “high degree of satisfaction” on the part of students. The department’s “extensive plans for curricular evaluation and redesign” were found to be “impressive.” Principal concerns centered on resources: the uneven quality of teaching labs, the need for resources to expand

laboratory experiences and coursework attuned to workforce development needs, and “faculty time and energy” spent on students who begin in Biology but switch to other majors.

- **Graduate programs.** The team found it “noteworthy” that the department has built a strong graduate research program in all areas by “abandoning the traditional generalized program in the department in favor of participation in broader interdisciplinary biology programs across campus,” an approach “now being employed widely in biology throughout the country.” The breadth of participation across departments and colleges was said to be “impressive.” The different programs were found to be “fairly even in the quality of their core curricula and opportunities for research training,” and the “quality of student research seems very high.” Concern was expressed over lack of stable and equitable funding across programs for graduate support (in some cases resulting in excessive teaching demands on graduate students), and a weak sense of identity with the department vs. the interdisciplinary graduate programs. The team also questioned the lack of clear organizational homes for the programs.
- **Departmental culture.** The “excitement” and strong commitment of the faculty were noted: “the faculty like their jobs, and it shows.” “World class” young faculty and “very impressive diversity” among faculty and students were praised. While interdisciplinary clusters were said to be “a strength paving the way to the future,” the team also reported a sense that “the Department’s loosely connected pieces may lack cohesion,” with the risk that they might devolve into “factions.” Achieving “buy-in for a unified theme to capitalize on the strength of the department” was cited as “a major challenge.”
- **Space and facilities.** In general, the team came away with “the overwhelming impression” that “members of the Biology Department are doing first world science in what are, in some cases at least, third world research facilities.” The team noted that much of the department’s space is “unsuitable for the technologically sophisticated research needs of contemporary biology,” and urged the institution to “acknowledge that upgrade and improvement of biology space is urgently needed.”

## ■ Results of the Review

The department commented on several of the team’s findings and recommendations. With respect to undergraduate instruction, the department concurred with the team’s concern over the condition of teaching laboratories and with its call for greater availability of laboratory courses. Improving facilities and expanding lab experiences were cited as significant cost items. Review of the undergraduate curriculum will continue, with a goal of focusing resources on majors. In terms of research, the department agreed with recommendations to increase the size of the faculty by at least five, to “foster connections among clusters,” and to create a sharper focus on ecology within the campus. The department reported that it had identified two research initiatives to respond to College priorities and link research clusters: a Global Change Biology initiative and a Dynamics of Cellular Organization initiative. Ecology was described as “a central subject within the Global Change Biology initiative.” The department concurred with the call for greater stability and support of the interdisciplinary graduate life sciences programs, and for “the development of long-term college-level administrative responsibility and financial support.” Several steps were described to help “develop cohesion within the department,” including efforts to develop a long-term hiring plan organized around overriding themes. Finally, the department echoed the team’s concerns about the quality of space for research and teaching, and referred to specific needs arising from a space analysis conducted as part of the AQAD self-study process. The Dean endorsed the department’s response.

