

October 1, 2008
Department of Molecular Biology
University of Wyoming
Academic Plan for 2009-2014

MISSION AND ASPIRATIONS

The Department of Molecular Biology is committed to providing the highest quality education for students at all levels. We recognize that molecular biology is an experimental science. Therefore the faculty has sought to develop an integrated program of teaching and research that will provide the maximum educational experience for undergraduate, graduate, and postgraduate students. The faculty strives to make this education a participatory experience in which the students are actively engaged in doing molecular biology.

The research mission of the Department is founded on the concept that research and creative activity are integral components of excellence in teaching and instruction. All disciplines in biology including biochemistry, genetics, microbiology, neurology and ecology are broadly linked by the principles and methodology of molecular biology. We strive to maintain diversity in our research activities and faculty expertise to afford students the broadest possible view of the discipline. This diversity also generates an atmosphere that fosters collaborative efforts both within and outside the Department.

The faculty of the Department of Molecular Biology provides service to the University, the State of Wyoming, and the international scientific community. We contribute to the development of the State by supplying expertise, working on projects of common interest and developing new technologies that are the foundation of economic development. At the national and international levels, the faculty serves the scientific community by participating in activities that promote education and research in molecular biology.

The current era is one of tightening federal funding for research combined with an explosion in new technologies. The Department requires new facilities that are large enough to house the entire faculty and suitable for the next generation of technologies. Updated facilities are also essential for the effective recruiting of new faculty and students. Thus, program development and improvements in infrastructure go together.

PREVIOUS PLANNING ACCOMPLISHMENTS: 2004-2008

2004-2008	
Action Items	Planning Accomplishments
1. Implement a university-wide graduate program in MCLS (Molecular and Cellular Life Sciences).	The MCLS doctoral program matriculated its first class in Fall 2006. Dr. Fay (MOLB) serves as the founding director of the program.
2. Implement a university-wide undergraduate degree program in genetics and genomics.	Molecular Biology hired two new faculty members in the area of bioinformatics and genomics. In addition, The NIH-funded INBRE program made bioinformatics

	an area of focus and founded a center on campus to support research in this area.
3. Revise our undergraduate curricula to introduce more molecular biology into the freshman and sophomore years for all life science majors.	As a part of cross-listing General Microbiology with the General Biology (LIFE) program, its syllabus has been given a renewed focus on genomics and molecular biology. The department created a sophomore-level course (MOLB 3000, Introduction to Molecular Biology), which was first taught in Spring 2007 and is required of our majors.
4. Strengthen Program Assessment.	The Department has established a mission statement and the yardstick for measuring student progress. Selected faculty members have begun to address program assessment in their individual courses. Among other assessment tools, the Department conducts exit interviews with graduating seniors to evaluate student satisfaction.

DEPARTMENTAL OVERVIEW

The Department of Molecular Biology has primarily a teaching and research mission. In support of that mission, the Department is home to 15 tenure-track faculty members. In addition, we have one extended-term Academic Professional engaged in teaching, one Associate Professor with a split appointment (25% in Molecular Biology and 75% in Botany) and one Professor with a 100% administrative appointment (Dean of Graduate College). We also have 4 administrative and 6 technical staff persons, 41 postdoctoral research associates and research scientists and 48 hourly employees for a total of 116 employees.

We offer the Bachelor of Science, Masters of Science (Plan A and Plan B) and the doctoral degree in Molecular Biology along with an undergraduate minor. In addition, we participate fully in the Molecular and Cellular Life Sciences doctoral program. Currently 27 Ph.D. students are housed in the department. Of these students, eight are enrolled in the Molecular Biology program with 19 in the MCLS program.

INSTITUTIONAL ISSUES

College of Agriculture. Our mission and action items are interlaced with the College of Agriculture Academic Plan III. Among our fundamental needs, the College has identified (i) developing a culture of lifelong learning and leadership in our students, (ii) providing sound fundamental and applied research as a foundation for our other endeavors, (iii) identification of unbiased, research-based solutions to problems, (iv) reaching out and engaging Wyoming's people, (v) providing for faculty success, and (vi) addressing significant issues facing agriculture, renewable natural resources, and rural communities. The Department of Molecular Biology shares a strong commitment to addressing these needs as outlined in our academic plan.

In the area of Teaching and Learning, the Department has committed itself to further advancing the process of program assessment. Access is an area of emphasis in the College and the Department will be exploring new avenues for outreach, particularly in the area of distance learning. In Research, the Department will participate with the University in an evaluation of the funding and operation of centralized core laboratories to improve our competitiveness for extramural funding. In this regard, we also support the College initiative to plan towards a new facility for the Departments of Animal Science and Molecular Biology. Not only are we short of space, but the infrastructure of AgC and the Animal Science / Molecular Biology buildings no longer supports current equipment and research needs. Finally, with our focus on basic and applied life sciences, the Department is a participant in one of the central Areas of Distinction in the College of Agriculture.

Creation of the Future 3. Molecular Biology shares multiple links to the University Academic Plan. The Department is fully vested in the life sciences Area of Distinction. Our academic plan further commits us to Graduate Education, to improved Delivery and Access to our academic programs. Our plan also takes concrete steps towards improving Student Success.

ACTION ITEMS

1. Development of Student Programs

a. Undergraduate Programs

- i. Student Recruiting and Retention. To ensure long-term growth in enrollment, the Department will develop a marketing plan for its undergraduate major. To this end, we've established a departmental standing committee to oversee undergraduate student recruitment and the implementation of our communication efforts. Furthermore, we will develop a FIG within our discipline and participate as requested in inter-departmental FIGs.
- ii. Program Assessment. With the goal of more data-driven decision-making, the department will develop a programmatic assessment plan. Assessment will require faculty involvement, will be embedded into the core courses of our discipline and will follow students from their freshman year through graduation measuring their progress against the published Departmental Mission Statement.

(http://uwacadweb.uwyo.edu/UWmolecbio/Assessment_Statement.asp)

b. Graduate Programs

- i. MCLS Doctorate. The Molecular and Cellular Life Sciences (MCLS) interdepartmental program is the principal focus of our doctoral program. We have donated all of our graduate assistantships to the MCLS program. In addition, we have committed Departmental resources to the administration of MCLS. Virtually all of our doctoral students are admitted through MCLS and we will continue our support of this crucial program.
- ii. Graduate Assistantships. The Department of Molecular Biology advocates that the number of Graduate Assistantships be increased across campus in number and in the level of support to ensure continued health and development of the Department's graduate programs, as well as interdisciplinary programs such as

- MCLS, the Programs in Ecology, Reproductive Biology and Neurobiology.
- iii. Masters Degrees. We will develop a mission statement for our Masters programs. In particular, we need to assess the needs of students in our Plan B Masters Program and determine if a curricular orientation towards professional schools is warranted.
 - iv. The Molecular Biology Doctorate. This doctorate serves the needs of students (e.g. nontraditional students) and faculty that cannot be met by MCLS. We will articulate the mission of the MOLB PhD and develop a marketing plan.
- c. Program Delivery and Outreach.
- i. Casper College and the Community College System. We propose to systematically develop closer ties to the community college system. We have the objective of coordinating course syllabi for lower division MOLB courses that are offered across the system, linking course content to the needs of upper division courses in the major and increasing the proportion of community college students in our field who finish their degrees at the University of Wyoming.
 - ii. Distance delivery of courses. For appropriate elements of our curriculum, we propose to explore offering courses at a distance with the objective of increasing enrollment and making our program accessible to students in other regions of the state.

2. Faculty Development Faculty recruiting and retention are crucial to the ongoing improvement in quality of undergraduate and graduate programs. Integrated across time, faculty hires have largely determined the strengths and weaknesses of our Department and the University. Thus, we propose a hiring plan designed to support our curriculum as follows:

- a. During the next 24 months, we will likely lose our immunologist (Isaak) to retirement. Given the specialized nature of immunology and the large teaching need in our undergraduate curriculum and in the WWAMI medical education program, we propose to hire a replacement proactively to minimize a gap in program delivery. Dr. Isaak's large teaching load also includes a major service course, Medical Microbiology. Given our long-standing policy to hire research active faculty, we may need to hire a second new faculty member capable of teaching the latter course.
- b. We will be losing a cell / developmental biologist to retirement this fall (Petersen) and will seek an immediate replacement chosen to complement needs in our teaching program.
- c. The Department will make requests for additional hires that are commensurate with programmatic need and the evolution of our discipline. In this context, we will explore joint appointments with other departments. As an example, we might work cooperatively with the Department of Chemistry to make an appointment in the broad area of quantitative or structural biology. With all hires, the Department commits itself to hiring the best available new faculty members. We propose to develop marketing plans that maximize the size of each applicant pool.

3. Facilities Planning / Research Infrastructure

- a. A new facility for Molecular Biology. Since the founding of the department 23 years ago, the faculty of Molecular Biology has been housed in two buildings separated by half

a mile. Even when new in 1987, the Animal Science / Molecular Biology building was too small to accommodate the entire Molecular Biology faculty and is increasingly ill suited for current technologies in biology. Our teaching and research missions have suffered accordingly. A crucial objective of the next five years is to identify and rank the physical plant needs of the department and begin fundraising for a new facility to house Animal Science and Molecular Biology.

- b. Research Infrastructure. The technology of biology has undergone a revolution during the last two decades. Many pieces of equipment and technologies, that are now crucial for the success of individual researchers, are too expensive and too specialized for one laboratory to own, maintain and operate. The department will work with the Dean's Office, the Vice-President of Research and interested departments to develop a systematic approach towards funding and operation of centralized core facilities.
- c. Research Management. We will work with the College and University administration to identify and manage fiscal issues related to soft-money employees who are eligible for board retirement. In addition, we will work with the College and University to establish mechanisms for maintenance of our physical plant in support of research and teaching missions.

4. Cross-college Programs in the Life Sciences

- a. Undergraduate Program in Microbiology. The Department of Molecular Biology continues its ongoing commitment to the interdepartmental Microbiology Program. We support the Microbiology in its efforts to broaden its connections across the University. In addition to teaching support for the Program, the Department of Molecular Biology is committed to advising support for students in the Microbiology major.
- b. Undergraduate Life Sciences Core Curriculum (LIFE). The Department will work towards a more integrated relationship with the LIFE program. Contingent on faculty hires, we will provide additional teaching in the LIFE core curriculum, genetics in particular. We also support the construction of new undergraduate teaching laboratory facilities with centralized support staff for the LIFE program and biology departments on campus.
- c. WWAMI Medical Education. The Department will continue its heavy involvement in physician training via the WWAMI program, both in instruction and in pre-medical advising among our undergraduate majors.
- d. Graduate Program in Ecology. The Department of Molecular Biology endorses the continued development of the interdisciplinary Program in Ecology (PiE). The University should commit adequate resources to ensure continued development of PiE.
- e. Integrative Biomedical Sciences Doctoral Program. We support development of an interdepartmental Integrative Biomedical Sciences Ph.D. program that would complement the MCLS Ph.D. program.

IMPLEMENTATION

Year 1: We anticipate implementing a recruiting / marketing plan for our undergraduate major. In addition, we will articulate the mission statement for the Molecular Biology doctoral program and begin the process of targeted recruiting.

Year 2: We should complete the process of re-envisioning our Plan B Masters of Science degree as a Professional Masters Degree with agreed upon prerequisites and curriculum. We anticipate increasing our participation in LIFE teaching beginning in the second year of the plan. And, in Year 2, we will implement a Molecular Biology FIG.

Years 1-3: We will be requesting two faculty hires in response to acute needs in our undergraduate and medical curricula that result from retirements. During Year 1, we will propose the hire of an immunologist. During Year 2, we will pursue the hire of cell/developmental biologist.

Years 1-5: Implementation of the following action items will be progressive, beginning immediately and concluding in the final year of the plan: (1) Planning and fundraising for a new facility, (2) Program Assessment, (3) Increasing our portfolio of courses offered at a distance.