

# **THE DEPARTMENT OF MICROBIOLOGY, MOLECULAR BIOLOGY AND BIOCHEMISTRY (MMBB)**

(Adopted from the Departmental Handbook and Strategic Planning)

## **Introduction and Context Statement**

The Department of MMBB is unique compared with other academic units at most state universities since it is a combined department which covers the traditional areas of both Microbiology and Biochemistry. Microbiologists in the early 1970s who were involved in studies on organisms such as bacteria, yeast, and fungi led the way in development of recombinant DNA and molecular biology techniques. These techniques are now widely used by biological scientists involved in studies ranging from the structure and function of macromolecules such as DNA and proteins to production and breeding of transgenic plants and animals. Biochemists played a key role in understanding key cellular processes such as DNA replication, protein synthesis, energy metabolism within cellular organelles and elucidation of hundreds of biosynthetic and catabolic reactions. Faculty in MMBB represent the many different areas noted above with respect to training, background, and current research interests; thus, they are able to work with a broad range of scientists in departments within the CALS and across the campus.

MMBB offers undergraduate majors in Microbiology, Molecular Biology and Biochemistry, and Medical Technology which appeal to students with a broad range of interests and different backgrounds. Our primary undergraduate teaching mission is to support our majors with a balanced and up-to-date curriculum to make them competitive with students at other state colleges and universities. Introductory courses in microbiology and biochemistry are required by over twenty majors across the UI campus.

We will be faced with several challenges in the next three to five years. We must maintain our momentum and leadership in both teaching and research at the UI, and, at the same time, respond to reduced federal funding and cut-backs in our state's budgets. Faculty research programs are supported by external competitive grants from federal agencies and have earned national and international reputations. Some faculty must be able expand their programs in order to remain competitive. This will require re-focusing for some and additional space and support facilities for others

## **Mission**

The mission of MMBB is to provide high quality teaching and research at the undergraduate, graduate, and professional levels in the areas of microbiology, biochemistry and molecular biology.

## **Vision Statement**

MMBB will provide educational and research programs in the disciplines of microbiology, biochemistry, and molecular biology at the UI. The Department will continue to foster strong teaching and research programs in the areas of environmental microbiology, medical microbiology, plant molecular biology and biochemistry, and developmental biology. We will lead CALS, the UI, and the State of Idaho in:

1) educating students and scientists in each field, 2) advancing knowledge and providing new technologies, and 3) serving as a source of information for the citizens of Idaho in issues related to agriculture, health, and industry.

## **Research**

### **Introduction**

Our long range goals are to develop state-of-the-art research programs and attempt to transfer knowledge, technology and expertise gained from our efforts to applications which meet the needs of agriculture and citizens of Idaho. The specific areas which appear to meet these objectives and make use of current faculty strengths and their interests are listed in Goal #1.

### **Goals**

**Goal 1:** To develop and/or maintain state of the art research programs in each of the following areas:

1. Applied and environmental microbiology
2. Microbial pathogenesis, food safety and disease prevention
3. Molecular and general genetics
4. Molecular development and cell biology
5. Mammalian, plant and microbial physiology
6. Biochemistry
7. Agricultural biotechnology

Action Plan-Programs must be large enough to be nationally recognized and provide useful interactions between faculty within the department. Progress will be monitored through reviews by outside experts (e.g. CSREES Review). Collaborations and involvement of teams will be encouraged where it is in the best interests of all participants.

**Goal 2:** To work/collaborate with appropriate organizations, commodity groups, and other departments in CALS to identify new research programs which respond to the needs of Idaho agriculture and its citizens.

Action Plan-We will listen, ask questions and continually assess each situation and reactions of stake holders to current research programs and proposed future programs. We will attempt to increase collaborative efforts between departments and institutes at the UI and with WSU.

**Goal 3:** To transfer knowledge, technology and expertise gained from our research efforts to applications including the private sector which/that will benefit Idaho's economy.

Action Plan-A diverse strategy including peer reviewed publications, seminars, workshops, distance education and the Internet will be employed to meet the needs of Idaho agriculture and its citizens.

**Goal 4:** To promote Plant and Animal Biotechnology at the UI through support of current faculty and new hires in critical areas.

Action plan-The advantages/disadvantages of reactivating the Genetics Program and developing a formal Plant Molecular Sciences program will be determined. One or both will be either activated or developed based on discussions with others in the Department of Biological Sciences and CALS. Further, we will work with research institutes at the UI to build biotechnology research infrastructure.

**Goal 5:** To integrate teaching and research activities in the classroom and encourage relating/associating problem-solving approaches in the classroom with research applications.

Action Plan-Teaching in the classroom and research will be integrated. We will provide opportunities for students to integrate problem-solving approaches into their research projects through our undergraduate and graduate courses. The goals of our research programs will be consistent with the mission and strategic plans of our teaching programs.

**Goal 6:** To maintain excellence in modern molecular sciences and the current balance of faculty in the disciplines of microbiology and biochemistry.

Action Plan-All new hires will have training and expertise in either microbiology or biochemistry. In addition, they will have training and experience in molecular biology so that they can teach courses in each area and use the molecular expertise in their research programs.

**Goal 7:** To increase our productivity at local, national, and international levels.

Action Plan-Productivity will be measured by publications in peer reviewed journals, external grant awards, and dissemination of new information. Our current high level of productivity will be either maintained or increased to promote recognition of the Department at local, national and international levels. All faculty are expected to apply for competitive funds from federal and state granting agencies, and pursue other avenues of funding such as Commodity Commissions and industry, with the help of the Dean and Directors in CALS.

**Goal 8:** To create an environment which fosters (encourages) creativity, innovative thinking, new approaches to research, and collaborative efforts at the UI.

Action Plan-We will use problem-based learning teaching in our courses to foster creativity, encourage innovative thinking and develop problem-solving skills. Our departmental seminar speakers, both from outside the University and other departments from within the UI, will expose faculty and students to new research techniques and facilitate collaborative research efforts.

