Biological Sciences at Michigan Technological University

Mission

We Discover, Develop and Disseminate knowledge in the biological sciences.

Vision

The Department of Biological Sciences will be a recognized regional, national and international leader in research, and in undergraduate and graduate education in life sciences.

Guiding Principles

- The role of biological science is the discovery and integration of basic knowledge from multiple fields of study as they apply to living systems.

- Advances in basic and applied knowledge provide a nexus from which theory, technology, and policy arise.

- The Department of Biological Sciences is the hub of life science initiatives at MTU and beyond, advancing knowledge and developing solutions.

- Our reputation and central Lake Superior location positions us to be a leader in Great Lakes research.

- All students need a diverse educational experience through which they can develop an appreciation of the connectedness of life and the environment across all scales of organization from molecules to ecosystems.

- The department is a leader in teaching biological literacy within the university, the surrounding citizenry, and the K-12 community.

- We value the direct and the intangible benefits that emerge from a diverse complement of research and teaching faculty.

Goals and Plans over the next 5 years

- We will maintain and enhance our reputation for providing excellence in undergraduate education in a broad range of biological disciplines.

- We will maintain and grow our high quality research and graduate programs focused in ecology, evolution and molecular biosciences.

- We will continue to develop our existing strengths in educating students in clinical lab sciences and pre-professional health sciences.

- We will foster interdisciplinary research and graduate training partnerships in human health related fields.

- We will be the interdisciplinary leader in biochemistry at MTU.

- We will grow our department to 21 tenure-track faculty, 400 undergraduate students and 40-50 graduate students.

- As we grow, we will preserve the synergy between research and professional development of graduate and undergraduate students within an interactive community of scholars.

Integration of Biological Sciences with the Strategic Plan and Capital Campaign

Possible Stories

Undergraduate Research: Growth of Bioinformatics- Student participation in internships IBM (Rochester, MN), Case Western Medical School (Cleveland, OH) Jackson Labs in Bar Harbor Maine; MTU- Department of Biological Sciences and School of Forestry.

Undergraduate- Allied Health: Praise for our undergraduates (from Hospital Program Directors) for the Clinical Laboratory Science program graduates as they

enter hospital internship Programs: In 2005, one of our CLS alumni was the top score in the National Boards for CLS examinations.

Undergraduate- Health Professions: Numerous success stories in Medicine, Chiropractic, Dentistry, Pharmaceutical, Optometry e.g. Brad Uren- L'Anse native, scholarship recipient, Graduated from U of Michigan Medical School: Now the emergency room chief resident and initiator of the medical helicopter service for severe trauma throughout the State of Michigan.

Bioathlon Outreach Endowment: Expand High School Biology competition. Engage more High School students in campus visits and long-term projects, use of internet for monitoring and student/faculty communication.

Bahamas Research Experience: Endowment to assist students in support of our 10 years of research on San Salvador analyzing effects of environmental impacts e.g. extremely dry summers, hurricanes, colonization effects.

Undergraduate and Graduate Scholarship and Fellowship Stories and endowments:

- Medical Alumni Scholarship
- Kathy Jean Jensen Scholarship
- Lillian Baklarz Scholarship
- Peter VanDusen Scholarship (Graduate)

Graduate Resources: Use of Molecular techniques solving Biochemical and environmental problems. Students and Faculty are benefited.

- Invasive species- Mike Gretz, New Zealand project with an invasive alga to streams around the world including Western U.S. trout stream. The alga is destroying stream environment for fishing.

- Species transitions- Charles Kerfoot, "Red Queen" Hypothesis work recently featured in Wall Street Journal and elsewhere.

-"Ring of Life"- Charles Kerfoot- developing story of the phytoplankton donut in southern Lake Michigan which supports the sport fisheries of Lake Michigan. Project a result of Remote Sensing Institute work.

-Diesel Emission project (Sue Bagley)- Collaboration: Twenty (20) plus years of collaboration with industrial and government sponsors to address environmental concerns of diesel particulate emissions.

-Fisheries Projects- Drs. Casey Huckins and Nancy Auer- Improve native fisheries in Upper Great Lakes; lake trout, brook trout, and sturgeon projects. Environmental support from strong advocates such as the Huron Mountain Club. How do we have economic growth which is environmentally friendly?

- Biochemical Sensors- Dr. Don Lueking- Collaboration: Use of biological molecules to sense environmental substituents, and toxic components.

- Biological Systems for degradation of recalcitrant environmental pollutants- Drs Don Lueking and Susan Bagley- Developing microorganisms to breakdown pollutant molecules with a long residence time in the environment. Development of bioreactors, concentrating systems, and specific genetics and metabolism to enhance these processes.

- Biochemical Mimics- Dr. Heather Youngs- Use of novel biochemical systems such as viruses to produce molecules which mimic important bioreactive compounds.

- Molecular Biology- Dr. Ramakrishna Wusirika- Developing of computational tools (Bioinformatics) to assay changes in food crops and speed-up crop selection.