Western Michigan University
Department of Biological Sciences


From the Chair

This has been the year of the Curriculum and what an exciting year it was. Major changes were enacted in both the graduate and undergraduate programs. The primary accomplishment was the development of a Ph.D. program in Biological Sciences. This year our program made it through the University curriculum committees and is scheduled to go before the State committee in July. If all goes well we could begin our program in the Fall of 1994. The program has some unusual features that are designed to give graduates a broader view of biology than a traditional Ph.D. program and to provide training of graduates to teach at the college level. There has been a national call to better mentor and train graduate students for their role as teachers and communicators. As part of the preparation for this program and to strengthen our masters program we will put into place this Fall a series of graduate courses that cover the areas of cell biology, physiology, ecology and evolution. Four of the six courses will be taken by our master's students and all 6 by the Ph.D. students. These courses will assure consistent course offerings for our graduate students.

Another large undertaking was the restructuring of our undergraduate majors that began this year. We currently have almost 600 majors, up from 450 just 2 years ago. About half are Biology majors, the other half Biomedical Sciences majors. The Department participated as one of 8 departments in a “Reforming the Major” grant from the American Association of Colleges. This grant was awarded to the College of Arts and Sciences at WMU. Our curriculum committee sent questionnaires to a random group of recent alumni and current majors, attended meetings by national experts on what a modern major should be like and talked with local employers in order to formulate this restructuring plan. In May the Department met in an all day session to discuss the majors. The plan would go into effect in the Fall of 1994. There are several new features to this program. It will provide for an integrated 2 semester “majors only” introductory course to help students get a broad overview of what it is like to be a biologist and better connect with the major. It will institute a capstone senior experience such as a research project, internship or senior seminar. Almost 20% of our seniors have completed a research project by graduation and in our survey almost 80% wanted some type of experience such as a research project or internship. The differences between the Biology major and Biomedical Sciences major were also strengthened and changes were made in the cognates so that biochemistry and statistics are required of all majors.

We appreciate the input of the alumni who were sent surveys. I am also interested in any suggestions for internships for our seniors that alumni might have. Finally, I would like to thank those who contributed to the Department last year by designating your University donation to the Department. Your funds were used to provide for undergraduate research, for our seminar program and other projects that are vital to the success of our programs. All contributions to the University can be designated to the Department of Biological Sciences by noting this in the check memo area. Checks should be made payable to the WMU Foundation and are tax deductible under both federal and state income tax.

Leonard C. Ginsberg, Professor and Chair

(616) 387-5637
INNOVATIONS IN TEACHING

CO-OP & CONFER in Plant Biology

By Dr. Elwood B. Ehrle

The first year's experience in building cooperative learning strategies and CONFER into plant biology (Bios 102) resulted in a lot of satisfaction, some frustrations leading to future changes, and a 4.49 (on a scale of 5.0) in the teaching and course evaluations prepared by the students who took the course.

Cooperative learning strategies require people to work in teams. Each lab section was divided into 5 teams of 5 students. They worked cooperatively on preparing lab reports and getting ready for exams. A team earned bonus points if their team average on an exam or lab report was better than the class average. About 80% of the teams worked well and earned bonuses on one exam or another. When a team wasn't working well it was usually because some team member let the rest of the team down. Next year will see better orientation of students to the CO-OP concept. They are so consistently trained as individualists and loners when it comes to learning that cooperation comes hard. Next year will also see a process for cutting out non-cooperating team members. With 6 lab sections in the Fall Semester and 5 during winter, better communication is needed. That's where CONFER comes in.

CONFER is an electronic Bulletin Board accessed through the university's VAX computer system. Our CONFER, dubbed BIO-BOTCO-OP, could be easily accessed by students, teaching assistants, and the instructor to organize study sessions, input lecture outlines, and suggest exam questions.

The greatest use of CONFER was the accumulation of student suggested exam questions. They wrote about 250 questions for each exam. I edited these to get the 80 best questions and added 20 of my own to adjust the balance between topics and the level of difficulty. The magic came in the fact that they wrote most of the exam themselves and every student could easily obtain a printout of other student's contributed questions. Since many came to the exams better prepared, they earned higher grades.

Corpus Morphus

By Dr. Cecil L. McIntire

During the Fall semester of 1992, I began work on the creation and production of Corpus Morphus, a game based on questions about human anatomy. The idea was to create a board game that could be played in a social setting by 2, 3, or 4 participants.

Better grades have traditionally been achieved by spending more time studying; and, as we all know, this means less time for social activities. With the game, there is a need to acquire some anatomical knowledge by going to lectures, labs, and studying the texts; but, instead of skeletonizing one's social life, students are encouraged to get together and play Corpus Morphus, a game which has 1944 multiple choice questions about human anatomy.

Actually, Corpus Morphus is 4 independent games: Skeleton, Muscles, Neural, and Visceral. Each game has 3 divisions and 26 subdivisions (subject categories) and within each category a player can elect to receive an easy question, a difficult question, or a question that is in-between.

Exactly which question a player is asked depends on the roll of a die. There's a little risk taking (double or nothing questions) and there's some luck (bonus questions). Each player has a duty to perform, e.g. the person who reads the questions is the Morphoinquisitor, the person who checks to see if answers are correct is the Know-It-All and the person who stores and allocates different colors of nuts, which are awarded for correct answers, is the Squirrel.
The Skeleton and Muscles games were completed and made available in the WMU and University bookstores during January, 1993 and the Neural and Visceral games became available by mid-semester. Purchases of Corpus Morphius have been much greater than projected, especially for the Spring session when all 4 games were compiled into one game packet that retails for $20.

Without exception, responses to the games have been positive and there have been two official Corpus Morphius contests. The first contest took place in conjunction with an organizational meeting to form the Association of Minority Students in the Biological Sciences. There were 25 participants including representatives from the faculty and administration. The second Corpus Morphius contest was campus-wide and sponsored by Biological Sciences and Student Life. It included an invitational mailing to persons who had taken Human Anatomy 211 during the past 3 years. The contest took place on two consecutive nights with the first place winner edging out the competition in three of the four games. There were cash prizes of $50, $35, and $20 in the first contest and $150, $100, and $50 in the second contest. Pre and post contest coverage in the student newspaper was quite good, and there is some possibility of making this an annual event.

Grades in 211 Human Anatomy have risen along with Corpus Morphius sales and efforts are underway to assess just how much the games are being used and by whom.

Game boards and game covers have gone through a number of revisions already, but for the foreseeable future the Skeleton gameboard will be the one pictured here and the game cover is essentially the same as the board but without the list of categories.

Anyone who has had a course in Human Anatomy will hopefully find Corpus Morphius interesting. If you play any of the Corpus Morphius games, I would like to know what you think about them. (616) 387-5634.

Project Focus

By Dr. Leonard C. Ginsberg

Along with four other faculty members at the University, I have been invited to work on Project Focus. As part of this project, a multimedia teaching room has been established in Sangren Hall. This room contains Macintosh computers, laser disks, CD ROM and a video projection screen to allow faculty to design and show computerized multimedia lectures. Part of the effort was the production of a series of multimedia lectures for my large Cell Biology course. These were used in conjunction with my computerized tutorials for the course to help students better visualize this material.

Seminar Program

By Dr. Karim Essani

The Department seminar program was re-established last year. Fifteen speakers were invited from outside this university during Fall and Winter semesters. The topics varied from “Diet Foraging in Ants” to “Ion Channels and Electricity of Heart” and “DNA Methylation in HIV.” The speakers were nationally and internationally known scientists in their area of expertise. This program has greatly enhanced the quality of our graduate program. The Department maintains a list of guests who are interested in attending these seminars. Any members of the community who are interested in this program may forward their name and address to Dr. Karim Essani, Seminar Chair.

RESEARCH

The Department has more than 35 graduate students. These students and most of the faculty are involved in significant research projects. Many of these projects have brought national and international recognition to the Department. These are a few examples:

Dr. Karim Essani (Assistant Professor) is interested in the molecular mechanisms involved in DNA methylation mediated suppression of eukaryotic genes. He uses Epstein-Barr virus and frog virus 3 as models to study these mechanisms. Other research projects in his laboratory include interactions of poxviruses with the mammalian immune system modulators. Part of his research is supported by an NIH grant. He was a member of a Study Group in Iridoviruses, International Committee on Taxonomy of Viruses, International Committee on the Nomenclature of Viruses of Lower Vertebrates and WMU Task Force on Aids. He presently serves on the International Research Scholar Review Board, Borgess Medical Center, Kalamazoo.
Dr. William F. Jackson (Associate Professor) joined the Department in 1989. Dr. Jackson's research is centered around the physiology, pharmacology and cell biology of blood vessels. His current research efforts, funded by grants from the National Institutes of Health and The Upjohn Company are directed toward understanding the role that potassium channels play in the physiology of vascular smooth muscle cells. Potassium channels are protein-lined, water-filled pores in cell membranes that allow positively charged potassium ions to move out of and into cells. Studies from Dr. Jackson's laboratory and others indicate that in vascular smooth muscle cells, potassium channels play a crucial role in determining resting membrane potential, which in turn regulates the movement of calcium ions into these muscle cells, and hence the degree of contraction of vascular smooth muscle. To study potassium channels, Dr. Jackson is using an electrophysiological method called "whole cell recording" that he learned during a mini-sabbatical last summer at The Upjohn Company. He is combining this methodology with functional studies to assess the effects of ion channel activity on the contractile activity of vascular smooth muscle cells. Using these methods, Dr. Jackson hopes to gain a better understanding of the role played by potassium channels in vascular smooth muscle function so that we can better understand how these cells function in health and in disease states such as hypertension, atherosclerosis and other diseases that affect the function of blood vessels.

Dr. Stephen Malcolm (Assistant Professor) joined the Department in September 1991 after completing a doctorate at Oxford University in England and postdoctoral positions at the University of Florida and Imperial College, University of London. Since his arrival Dr Malcolm has established a laboratory of chemical ecology in McCracken Hall that includes the latest Waters HPLC system with diode array detection.

Dr. Malcolm's current research is focused on the chemical mediation of interactions between milkweeds and their herbivores. He also has an interest in ecological risk assessment for the use of genetically engineered plants. Recent academic visitors to Dr. Malcolm's lab have included Dr. Susanne Dobler from the University of Basel in Switzerland, Dr. Myron Zalucki from the University of Queensland in Australia and Dr. Lincoln Brower from the University of Florida. Dr. Zalucki is spending the summer in the Department working with Dr. Malcolm on how milkweed latex and associated toxins influence herbivore feeding.

During the past year Dr. Malcolm has presented his research at international meetings in California and The Netherlands and is an invited symposium speaker for the next annual meeting of the International Society of Chemical Ecology, to be held in Florida this August.

In February, the book, Biology and Conservation of the Monarch Butterfly, edited by Stephen Malcolm and Myron Zalucki was published and is receiving attention for both its academic and conservation content.

Dr. Malcolm continues to edit the International journal Chemoecology with Dr. Michael Boppré of the University of Freiburg in Germany. Last year he published 9 articles or book chapters, these include:


STUDENT RECOGNITION

The following awards were presented at our annual awards luncheon in April: Presidential Scholar in Biological Sciences - Melissa Olson; Distinguished Senior in Biomedical Sciences - James D. Decker; Distinguished Senior in Biology - Todd A. Clason; Merrill Wiseman Award in Microbiology - Molly A. McKeeough; Distinguished Biology Graduate Student - Christopher D. Jackson; Distinguished Biomedical Sciences Graduate Student - Randy R. Enciso; Margaret Thomas Du Mond Award (Best Biology Major in Secondary Education) - Winter Semester 1993 Beth Ann Houseal; Hazel Wirick Scholarship (Sponsored by Kalamazoo Garden Council) - Winter Semester 1993 Christopher D. Jackson and David W. Schuen.

NEW FACULTY

Dr. Alex Enyedi, Ph.D., Pennsylvania State University. Joins the faculty next Fall as an Assistant Professor in Biological Sciences. Professor Enyedi is a plant molecular biologist and physiologist. He joins the Department from his post-doctoral fellowship at the Center for Agricultural Molecular Biology at Rutgers University. His research interests include the investigation of salicylic acid as a transduction signal in the development of systemic acquired disease resistance in plants. He has also published on the role of oxidative stress on plants.

OTHER NEWS

Undergraduate Research & Creative Activities Award Winners. 4 out of the 25 awards for Winter, 1993, went to Biology or Biomedical Sciences majors: Lora Campbell (Bio.), Gail Celio (Bio.), James Donald Decker (Biomed.), and Ryan McCleary (Bio.). Each student was awarded $1000. Awards for Fall, 1993 of $1200 were given to Sheri Holmen (Biomed.) and Angela Kabbe (Biomed.).

Students Graduate from the Lee Honors College. Students graduating from the Honors College were awarded certificates on April 17, 1993. The biology and biomedical science students included: Troy Ahlstrom, Lora Campbell, Gail Celio, Dylan B. Keon and Ryan J. R. McCleary.

Greenhouse. The greenhouse technician, Mr. Larry Yarger, is a recent arrival on staff in the Department. He is currently working on the development of the horticultural and botanical educational facilities encompassed in the WMU Plant Science Greenhouse and courtyard gardens. Current projects include the classification and labeling of extant plant species in the greenhouse, demonstration plantings of chili peppers and the development of programs to encourage the utilization and enjoyment of the facilities, both by the University and community at large. Larry Yarger invites you to tour our facilities. 387-5618

The Michigan Academy Arts, Sciences and Letters met on the campus of Western Michigan University. The Biological Sciences Department made a very strong showing at the March 5-6, 1993 meeting. The following faculty, students, or collaborators made presentations: Dr. Leonard Beving, Randy Enciso, Robert Eversole, Charles MacKenzie, and Steven Greene; Dr. Richard Brewer, John B. Van Orman and John Olson; Dr. Karim Essani, Celene Spangler, Ginny Garlock, Sarah Neering, Dr. Naeem Essani, Janice Knight and Dr. Joseph Esposito (CDC, Atlanta); Dr. Gyula Ficsor, Jennifer Goodwin, Bradley Young, Joyce Hinders Leon, and Wayne Latack; Dr. Leonard Ginsberg, Kenneth Rank and Dr. Rolf Kletzien (Upjohn); Dr. Susan Stapleton and Eric Berg. Dr. Gyula Ficsor organized a successful AIDS Symposium during the Academy meeting. Dr. Karim Essani and Biological Sciences Alumnus, Susan Poppe (Upjohn) were among the speakers.

Jackson Named to NIH Peer Review Board. Dr. William F. Jackson will serve for the next 4 years on the Clinical Sciences Two Study Section of the NIH's Division of Research Grants. Members of this section review grant proposals and evaluate their scientific and technical merit
before making recommendations on those proposals to the appropriate NIH national advisory council or board.

Minority Student Organization formed in the Department. There was a meeting on March 30, 1993, to form an organization of minority students in the Department. The meeting consisted of: a welcome by Dr. Leonard Ginsberg; an introduction by Dr. Cecil McIntire; a keynote speech by Dr. LeRoi Ray, Jr., Director of Black Americana Studies Program; an organizational meeting, and a Corpus Morphus contest.

Dr. Friedman to Retire. Dr. Stephen B. Friedman (Professor), will retire from the Department of Biological Sciences the end of the Fall Semester 1993. Dr. Friedman received his Ph.D. in microbiology from the University of Illinois in 1962. He joined the faculty at Western Michigan University in 1966 after a postdoctoral fellowship in Belgium and a research position at the Cold Spring Harbor Laboratory. Dr. Friedman’s research at WMU on microbial biochemistry has resulted in numerous publications. His research has been funded by grants from the National Institutes of Health, the National Science Foundation and The Upjohn Company. Dr. Friedman has been a valuable member of the Department as a teacher and an advisor. He has served as the major advisor for many graduate students. As Departmental and pre-med (pre-professional) advisor he has been a mentor to a generation of Biology and Biomedical Sciences majors.

NATIONAL FUNDING

Dr. Rolf Kletzien (Adjunct Professor), Dr. Leonard Ginsberg and Dr. Susan Stapleton currently have a grant from the National Institutes of Alcohol and Alcohol Abuse to study the Effect of Ethanol on the Induction of the enzyme Glucose-6-phosphate dehydrogenase. The grant will use molecular techniques to study how compounds like alcohol turn on genes. Amount $131,790/year.

Dr. Karim Essani received a grant from the National Institutes of Health (NIH) to study the Methylation of DNA in frog virus 3. Amount $109,000/3 years.

Dr. William Jackson received a grant from National Institutes of Health to study Microvascular Function. “Control of Microvascular Function by Oxygen”. Amount $532,872.; The Upjohn Co. Grant for research on potassium channels. Amount $24,500.

Department of Biological Sciences
Western Michigan University
Kalamazoo, Michigan 49008-3899