From the Chair:

Dear Alumni and Friends:

In the 2000/2001 academic year we braved our new Carnegie Foundation status as a Doctoral/Research University-Extensive Institution, a designation that makes WMU a peer institution with U of M and MSU. To that end, President Floyd describes us as a “student centered research institution.” The Department of Biological Sciences has reflected this description for years. In this newsletter, you will read about our students who have won praise for their work and about faculty who are excellent teachers while maintaining productive research careers that involve students. Biological Sciences continues to grow. During the past academic year we totaled 820 majors, 240 minors, 35 Masters and 14 Ph.D. students.

A new faculty member will be joining the department next fall. Dr. Brian Tripp accepted an interdisciplinary position authorized by President Floyd to coordinate a new masters program devised to train students for careers in high throughput screening technology. With his chemical engineering doctorate and postdoctoral training in molecular biology, he is an excellent “fit” for this position. It requires that he work closely with the high throughput screening units of the four pharmaceutical companies that have sought affiliations with us. We think this program is a very good example of how an academic institution can specifically work with the community. We propose to provide a rigorous curriculum combined with a career-oriented experience that should lead to immediate job placement and flexibility to fit other positions in the pharmaceutical and biotechnology industries. Our program is unique, though other universities are sure to follow our lead. Dr. Tripp will have a joint appointment in Chemistry and thus will teach for both departments.

Two of our colleagues have elected to retire at the end of this academic year. Many of you will remember Dr. Gynla Ficsor, who was the mainstay of our genetics teaching. He will continue to service a “Bridges” grant, which is designed to bring early college minority students to WMU in the Spring and Summer sessions to experience research with faculty in the natural sciences. The other emeritus faculty is Dr. Robert Eisenberg, who was our senior microbiologist. He will also continue working on some funded research projects. Both were given well-attended retirement parties at the Oaklands on campus.

I have decided to return to the faculty after 5 years as Chair. Dr. Alex Enyedi will serve as Interim Chair. I know he will do well, bringing fresh ideas about fulfilling the department’s mission. You can learn more about his research and teaching from our website (www.wmich.edu/bios). We are especially proud of his winning the Alumni Outstanding Teacher Award this year.

I hope your lives are prospering and happy. Please let me know what your career is and your suggestions for our future goals.

Leonard Beuving, Ph.D.

Mark your calendars for this year’s Pepfest at Homecoming. For more details look for Accent on Alumni in your mailbox.
The following fourteen students were honored for their excellence within the department at the Departmental Spring Luncheon, held April 12, 2001.

* Vanessa R. Bodnar – Distinguished Senior in Biomedical Sciences

* Jason J. Frentess – Distinguished Senior in Biology

* Clifford W. Latta, Jr. – Distinguished Pre-Professional in Biological Sciences

* Brenton K. Lehmkuhl – Merrill Wiseman Award in Microbiology

* Guat Hoon Tan – Merrill Wiseman Award in Microbiology

* Julie K. Stahlhut – Distinguished Biology Graduate Student

* Erica Wehrwein – Distinguished Biomedical Sciences Graduate Student

* Dawn M. Lawrenz – Margaret Thomas Du Mond Award, Winter 2001 Semester

* Laura L. Strehlow – Hazel Wirick Scholarship, Fall Semester 2000

* Erin M. Meyers – Hazel Wirick Scholarship, Winter Semester 2001; Frank Hinds Zoology Award

* Bethany Rae Huot – William Follis, M.D. Scholarship, Fall Semester 2000 and Winter Semester 2001

* Sarah E. Kelly – Leo C. Vander Beek Graduate Student Plant Physiology Award

* Anthony F. O’Neal – Colin J. Gould Memorial Scholarship

* Amy M. Watson – Presidential Scholar in Biological Sciences

* Joseph W. Duris – Masters candidate for teaching

* Erica Wehrwein – Masters candidate for research

* Cathy Merovich – Doctoral candidate for teaching

* Julie K. Stahlhut – Doctoral candidate for research

Congratulations to our two Creative Scholar Nominees, Joe Duris and Cathy Merovich, as they were named All-University Graduate Teachers. Our department nominated them to be two of twenty-nine graduate teachers to receive the 2001 Graduate Teacher Effectiveness Award. Furthermore, they were also chosen by a special committee to receive
the All-University Award for Graduate Student Teaching Effectiveness for 2001. Only fourteen graduate student teachers campus-wide received this award. A special notation of this award will be placed on their official University transcript, as well as special recognition in the commencement program upon graduation. The Graduate College, the Graduate Studies Council and the Graduate Student Advisory Committee present this award.

2000-2001 Graduate Research and Creative Scholar Award

Congratulations are in order for our department nominees, Julie Stahlhut and Erica Wehrwein, as they were two of thirty-three recipients of the Graduate Research and Creative Scholar Award. Ms. Stahlhut was recognized as a Department Scholar. A special committee also chose Ms. Wehrwein to be one of twelve students to be named an All-University Graduate Research and Creative Scholar for 2001. A special notation of this award will be placed on her official University transcript, as well as recognition in the commencement program upon graduation. The Graduate College, the Graduate Studies Council and the Graduate Student Advisory Committee sponsor this award.

The Undergraduate Research and Creative Activities Award was initiated by Dean Elise Jorgens to encourage undergraduate involvement in research.

with professors. Each semester, students are awarded $500 each to support a research plan, along with faculty sponsorship. This award may be renewed one time.

* Kirsten Bekker – “Transposon Mutagenesis of Pseudomonas aeruginosa.” {Dr. Silvia Rossbach} (Fall 2000, Winter 2001)

* Debra Dalton – “Isolation of NUM 1-interacting Proteins by a Two-hybrid Selection.” {Dr. John Geiser} (Winter 2001)

* Awet Embaie – “SOS Repair of TA1975 psk 1002.” {Dr. Gyula Ficsor} (Fall 2000)

* Stephanie Fleming – “Effect of Elevated Atmospheric CO₂ on Phytoestrogens: Implications for Global Endocrine Disruption.” {Dr. David Karowe} (Winter 2001)

* Scott Foster – “Risk Assessment of Transgenic Squash (Cucurbita pepo).” {Dr. Alex Enyedi} (Fall 2000)

* Marisa Hart – “Expression of Glial-Derived Neurotrophic Factor in Cultured Skeletal Muscle Cells Isolated from Embryonic Chicken.” {Dr. John Spitsbergen} (Fall 2000)

* Julie Hout – “Cell survival in Excision Repair: Proficient and Deficient A. typhimurii.” {Dr. Gyula Ficsor} (Fall 2000)
* Erin Ivory – {Dr. David Cowan}  
(Winter 2001)

* Brent Lehmkuhl – “Tn5-Mutagenesis of Sinorhizobium meliloti.” {Dr. Silvia Rossbach}  
(Fall 2000)

* Joshua Metzger – “Microplate Analysis of Gene Expression in E. coli and Salmonella.” {Dr. Leonard Ginsberg}  
(Fall 2000)

* Erin Myers – “Dung Beetle Modification of Standard Rates of Dung Decay in Savannah Scrubland.” {Dr. Stephen Malcolm}  
(Spring/Summer 2001)

* Natalie Wallace – “Altered Nerve Growth Factor (NGF) Expression in Blood Vessels of Hypertensive Rats.” {Dr. John Spitsbergen}  
(Spring/Summer 2001)

* Tammi Hoevenaar – Graduate Student Travel Award “The Effect of Cardenolides Latex from Asclepias curassarica and A. incarnata on the Foraging Behavior of Monarch Butterfly (Danaus plexippus) larvae.” {Dr. Stephen Malcolm}

* Chin-ju Hsiao – Graduate Student Research Award “AP-1 and Cadmium Induced Oxidative Stress.” {Dr. Susan Stapleton}

* Janet Lynn – Graduate Student Research Award “Metal Regulated Gene Expression in Sinorhizobium meliloti.” {Dr. Silvia Rossbach}

* Lisa Reeber – Graduate Student Travel Awards “Effects of Sensory Neurotransmitters on Neurotrophic Factor Expression by Cultured Vascular Smooth Muscle Cells.”*  
“Expression of Neurotrophic Factor by Vascular Smooth Muscle Cells in Culture is Not Regulated by Level of Sympathetic Innervation.” {Dr. John Spitsbergen}

* Lynn Shooks – Graduate Student Research Award “Oxidative Stress and Regulation of Transcription.” {Dr. Susan Stapleton}

* Erica Wehrwein – Graduate Student Travel Awards “Effects of Walk Training on Glial Cell Line-Derived Neurotrophic Factor (GDNF) Expression in Skeletal Muscle.”*  
“Glial Cell-Lined Derived Neurotrophic Factor is Regulated in an Activity Dependent Manner in the Rat Soleus.” {Dr. John Spitsbergen}

Each year the Awards and Fellowships Committee selects a limited number of research proposals to receive financial support for continued research or travel expenses incurred for out-of-town presentations. This award is provided by the Graduate College.

* Joe Duris – Graduate Student Travel Award “Shifts in Microbial Community Structure in Hydrocarbon Impacted Sediments Associated with Alterations in Physical Parameters of Soil.” {Dr. Silvia Rossbach}
Student Awards & Activities

Arts and Sciences 2001: A Celebration of Research and Creative Activities

This year was the third annual "Arts and Sciences 2001: A Celebration of Research and Creative Activities." In this college-wide competition, ten students are chosen to receive the Outstanding Student Poster Award. The posters are chosen on the basis of clarity of presentation, quality of research and attractiveness of the poster. This year two Department of Biological Sciences students received this award.

* Kara Stark – "Altered Eosinophils in Peyer’s Patches of Nematode Infected Intestines." (Dr. Leonard Beuving and Dr. Robert Eversole)

* Angela Krawczyk – "Survey of Lifting Injuries in Air Ambulance Crew Members." (Suzan Olson, Bronson Center for Clinical Research)

Volunteer Service Award

Danielle Tanis was one of ten WMU students to receive the 10th Annual Volunteer Service Contest Awards, sponsored by the Office of Student Financial Aid. The applicants were evaluated on the amount and impact of the volunteer work, as well as the change resulting from the work. Danielle’s volunteer resume includes work at they YWCA Sexual Assault Program, Bethany Christian Services, Alternative Spring Break and Big Brothers/Big Sisters. She also provides assistance for a quadriplegic Kalamazoo man. Keep up the good work Danielle!

Presentations

What a year for presentations! This year 12 of our students presented at 12 different conferences and meetings.


* Kimberly Clark – “Regulation of Nerve Growth Factor Expression in Cultured Vascular Smooth Muscle,” →11th Annual Argonne Symposium for Undergraduates in Science, Engineering and Mathematics (Chicago, IL)* Annual Meeting of the Michigan Chapter of the Society for Neuroscience (Ann Arbor, MI) (Dr. John Spitsbergen)

* Matt DeVries – “Chronic Nitric Oxide Blockade-Induced Hypertension Suppresses Nerve
Growth Factor Production in Sympathetically Innervated Arteries.” → 18th Scientific Meeting of the International Society of Hypertension (Chicago, IL) Star “Hypertension Differentially Affects Arterial and Venous Smooth Muscle NGF Expression.” → Experimental Biology Conference (Orlando, FL) Star “Altered Nerve Growth Factor Expression in Animal Models of Hypertension.” → Michigan Hypertension Workshop (Battle Creek, MI) {Dr. John Spitsbergen}

* Joe Duris – “Shifts in Microbial Community Structure in Hydrocarbon Impacted Sediments Associated with Alterations in Physical Parameters of Soil.” → 101st General Meeting of the American Society for Microbiology (Orlando, FL) Star “Microbial Communities and their Effects on Silica Structure and Geophysical Properties in Hydrocarbon Impacted Sediments.” → Summit 2000 Geological Society of America Annual Meeting and Exposition (Reno, NV) {Dr. Silvia Rossbach}

* Tammi Hoevenaar – “The Effect of Cardenolides Latex from Asclepias curassavica and A. incarnata on the Foraging Behavior of Monarch Butterfly (Danaus plexippus) larvae.” → Monarch Population Dynamics Meeting (Lawrence, KS) {Dr. Stephen Malcolm}

* Gretchen Holt – “Macrophage Response in the Olfactory Bulb after Peripheral Injury.” → 15th Annual National Conference for Undergraduates in Research (Lexington, KY) {Dr. Christine Byrd}


* Suzanne Richards – “Activity Dependent Regulation of Neurotrophic Factor Expression in Cardiac and Skeletal Muscle.” → Kalamazoo Community Medical and Health Sciences Research Conference (Kalamazoo, MI) {Dr. John Spitsbergen}
Student Presentations & Awards

* Julie Stahhut – “Complementary Sex Determination in a Solitary Hunting Wasp.” Michigan Entomological Society Annual Meeting (Kellogg Biological Station, Hickory Corners, MI) {Dr. David Cowan}

* Erica Wehrwein – “Effects of Walk Training on Glial Cell Line-Derived Neurotrophic Factor (GDNF) Expression in Skeletal Muscle.” The Integrative Biology of Exercise sponsored by the American Physiological Society (Portland, ME) {Dr. John Spitsbergen}

* Holly Yettaw – “Characterization of the Mitral Cells in the Olfactory Bulb of Zebrafish.” National Conference for Undergraduates in Research (Lexington, KY) {Dr. Christine Byrd}

Creativity, scientific rigor and significance of the research. The title of Ms. Stahhut’s presentation was “Complementary Sex Determination in a Solitary Hunting Wasp.” Dr. David Cowan is her faculty mentor.

This year students, alumni and colleagues recognized Dr. Alex Enyedi for his exceptional classroom performance when the WMU Alumni Association named him as one of two recipients of the Alumni Teaching Excellence Awards for 2000. Dr. Enyedi instructs a wide range of classes from Molecular and Cellular Biology to Plant Physiology, as well as Teaching of Biological Sciences. Congratulations!

NEW FACULTY

Dr. Brian Tripp will join us next fall as the new High Throughput Screening Director. Dr. Tripp received his Ph.D. from the University of Utah in 1993. He is currently finishing a postdoctoral research in the Department of Biochemistry and Molecular Biology at Pennsylvania State University. He has a multidisciplinary science and engineering background, with seven years of industrial and academic postdoctoral experience in various aspects of molecular biology, protein chemistry, biophysical chemistry and microbiology.

Congratulations to our very own Julie Stahhut on a second place finish at the Michigan Entomological Society’s first student oral presentation of papers competition, held during the MES Annual Meeting. The presentations were based on the quality of the written abstracts, the presentation and the
The NIH supported student development grant “Individual-Centered Bridges to Biomedical Research Careers” is in its second year and is funded until October 1, 2002, with the largest grant awarded in the University Community in October 2000, under the direction of Gyula Ficsor Professor Emeritus of Biological Sciences and Leonard Ginsberg, Associate Dean of the Arts and Sciences College. The goal of the program is to encourage and mentor under-represented minority students (African Americans, Hispanic Americans, Native Americans and Pacific Islanders) to become biomedical scientists in the widest possible definition of the term. The grant requires that we identify under-represented minority students at community colleges, engage them at the community colleges as lab assistants and provide individual and group learning and mentoring experiences. We are in formal agreement with Grand Rapids Community College, Kellogg Community College, Kalamazoo Valley Community College and Lake Michigan College. Upon the recommendation of professors at the community colleges and our examination of the applications, we invite students to become Bridges Research Assistants at Western.

This spring, twelve students were appointed as Bridges Research Assistants. For two weeks the students work as a group on laboratory procedures that will be of help to them when they are placed in a research lab at Western. Another very key aspect of the two-weeks research introduction lab is the visits to research labs where the professors explain their research. As these research visits are going on, students are amazed by the variety and sophistication of research being done at Western and how nice those professors are. Following the research visits, students will get in touch with individual professors to see if a match can be made between a student and a professor.

We, as Co-Directors, are both touched and gratified that so many of our faculty and staff find time for talking to the Bridges students. Special thanks to the following for inviting the Bridges Research Assistants to visit their labs:

Dr. Christine Byrd
Dr. Cindy Linn
Dr. David Reinhold (Chemistry)
Dr. DeWayne Shoemaker
Dr. Steve Malcolm
Dr. John Spitsbergen
Dr. Rob Eversole
Dr. Leonard Beuving
Dr. John Miller (Chemistry)
Dr. Lisa Baker (Psychology)
Dr. Todd Barkman
Dr. Bill Jackson
Anna Jelaso (Environmental Research Center)
Dr. Chuck Ide (Environmental Research Center)

The Bridges Research Assistants and their colleges are:

GRCC(Advisor Prof. Nancy Forrest)
Raeh Elema
Siobhan Walters
Gregory Williams
Crystal served as a member of the control group in an on-going dietary study. The remainder of the time she was involved in a research project with the National Heart, Lung and Blood Institute on the NIH campus. While there, Crystal was able to meet and work with nationally known scientists, and returned to Washington in the spring for public presentation of the research in which she had a part.

Western Michigan University is one of only twenty colleges and universities invited to partake in this program. Joan Mallin, national program director, visits our campus yearly in search of new participants for the next two calendar years. For more information on this program, please contact Carolyn Hornev at (616) 387-2745 or hornev@wmich.edu.

The Faculty Senate and then University President John Bernhard established the Presidential Scholars Award in 1980 to recognize each department’s single most outstanding senior. In order to qualify for this award, seniors must show general academic excellence, academic and/or artistic excellence in their department’s program as well as general intellectual and/or artistic promise. Amy M. Watson not only met these criteria to be nominated by the Department of Biological Sciences, but also earned the honors of Presidential Scholar by the Department of Art. After graduation, Ms. Watson plans to travel to Paris and Northern Ireland on a political study tour.
and work in arts advocacy or in a museum or gallery in Washington, D.C. prior to pursuing a graduate degree in painting.

Cellular Neurobiology- Dr. Christine Byrd, Assistant Professor

I remember being taught in college that you are born with a certain number of brain cells and when you lose those cells, they cannot be replaced. Well, that is not true! I learned in graduate school that the adult brain is not a static structure; in fact, it is surprisingly malleable. New cells are added, new connections are made, and new information is stored. This is true for all animals, including humans! One place in the brain that is known for the extent of its plasticity is the olfactory bulb, the site where information on the sense of smell is processed. This neural structure is known to be continually developing, and since I was trained as a developmental biologist, I am particularly fascinated by this brain region. I am using the olfactory system as a model for my studies on the cellular and molecular basis of plasticity in the brain. If we could understand why some areas of the brain are able to produce new nerve cells, then perhaps we could promote regeneration in other brain areas after damage by stroke, trauma, or disease.

My lab uses the common aquarium fish, zebra danio, in our studies (Figure 1). This fish is widely used for scientific research in thousands of laboratories around the world. Zebrafish are well suited for work on molecular and cellular biology, genetics, and developmental biology. These fish lay eggs daily; the embryos are transparent, so one can observe the early processes of organ formation; the fish are inexpensive and easy to maintain in the laboratory; the zebrafish genome is nearly sequenced, so there is much genetic information available on these animals; and the community of zebrafish researchers is very open with ideas and very willing to share resources.

Figure 1 shows an adult female zebrafish.

The current work in my laboratory is focused on two areas. The first is an examination of the process of neurogenesis (the formation of new nerve cells) in the olfactory bulbs of
adults. I have shown that new cells are generated in the adult zebrafish brain, and many of those cells become neurons that integrate into the olfactory bulbs. This is a process that had been identified in a variety of animals, including rats and mice, but had not been shown to occur in this fish. I am now characterizing the newly formed cells and examining the molecular signals that direct their birth, migration, and differentiation. I believe that in zebrafish, I can elucidate many of the factors responsible for these processes. These factors are very likely to be similar to those that direct the same processes in the mammalian brain.

My second area of research is an analysis of how the olfactory organs (i.e., the cells in the nose) affect the maintenance of the morphology of the olfactory bulb. We know that the nose provides the bulb with information about the odorants it detects, but I believe the nose provides structural information to that brain area that regulates the number of cells, the shape of the cells, and the ability of the cells to remain viable. For these studies, I remove the olfactory organ of adult zebrafish in an attempt to better understand the molecular signals that the nose sends the brain (Figure 2). The olfactory bulb on the side of the manipulation is profoundly affected by this manipulation; it is half the size of normal structures. I am examining the changes in activity levels, gene and protein expression, and cellular morphology of the deafferented olfactory bulb to further investigate this phenomenon.

Figure 2 shows a section through the head of a zebrafish that had the right olfactory organ ablated (*); the olfactory bulbs (ob) and the intact olfactory organ (oe) are shown.

Both of these areas of research will lead to a better understanding of the changeable nature of the adult brain and the molecular factors and cellular interactions that are important in the maintenance of functional, healthy brain structures. This research has important implications for neural regeneration and recovery from brain injury and disease.

Much of the work from my laboratory is performed by the hard-working undergraduate and graduate students who train with me. My research is funded primarily by the National Institutes of Health-National Institute on Deafness and Other Communication Disorders.
In January 2001, Dr. Gabor Gullner arrived from Hungary to begin a five-month research project in the laboratory of Dr. Alex Enyedi. Dr. Gullner is the first Fulbright Scholar to be hosted by the Department of Biological Sciences.

Dr. Gabor is a research scientist with the Plant Protection Institute (a division of the Hungarian Academy of Sciences) located in Budapest – he and Dr. Enyedi first met via the Internet where they exchanged scientific journal article reprints and discussed possible collaborative research projects.

During 2000, Gabor and Alex prepared a research proposal titled "The Role of Glutathione in the Regulation of Signaling Pathways Involved in Plant Defense Responses" which was subsequently funded by the International Fulbright Scholarship Program.

While at WMU, Gabor was very successful with his research project and developed an HPLC assay to measure glutathione levels in plant tissue. The preliminary results of the collaboration will be presented at the 5th Congress of Oxygen, Free Radicals and Oxidative Stress in Plants to be held in Nice, France during the last week of November.