

# Bio:Life

**BGSU** COLLEGE OF ARTS & Sciences  
BOWLING GREEN STATE UNIVERSITY

## DEPARTMENT OF BIOLOGICAL SCIENCES ALUMNI NEWSLETTER

### Chair's message



**Hello Alumni!** BGSU now has the most prepared undergraduate freshmen class (since you were here, of course!) and we are currently teaching 708 biological sciences majors. For alumni of our graduate program, we have 27 new students this fall from all over the globe (India, China, Kenya, Ghana and Ohio). What

an intellectual environment for all of us. We hope you are prospering in all aspects of your life and that you have kept in touch with fellow students and faculty here; you also can stay connected via our Facebook page.

So, here is where I ask you to think about your experiences at BGSU and request that you support biological sciences scholarship programs. We have numerous undergraduate scholarships and our students (your successors!) could benefit from your support. Your sustained giving helps students with research experiences and other opportunities.

**Graduate student alumni** – Biological sciences has new funds to support our research commitment to your academic siblings: a chair's graduate student research fund and a faculty-supported graduate student research fund. Now we need your help. If 100 alumni give \$50 each annually, we would have a great start to a sustaining alumni program for supporting our graduate students.

Please consider this and all of our scholarships. You can give directly to biological sciences and we will submit the paperwork. OR, when you hear from the BGSU advancement office, if you specifically state that you want your contributions to go to a biological sciences scholarship/fund, we will receive these contributions directly for our students.

Thank you. If you enjoy the newsletter, let us know, and get in touch with me any time. Take care.

**Jeff Miner**  
*Professor and Department Chair*

### Whip spiders find home; BGSU researchers study navigational puzzle



The rain forest of Costa Rica presents a jungle-esque maze of dense vegetation, with the ground under it a snarl of exposed roots and heavily matted decaying plant material.

But in the inky black of night in that seemingly endless and impossible

labyrinth, BGSU professors Drs. Dan Wiegmann and Vern Bingman are searching for a portal that could reveal the science behind one of the more sophisticated and puzzling navigational systems in the natural world.

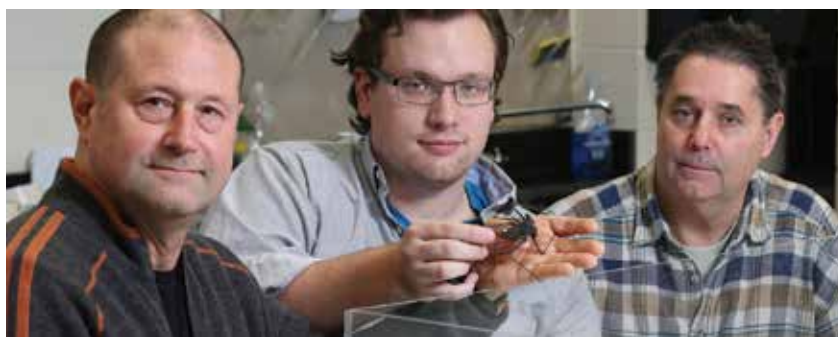
Wearing headlamps and armed with the trust that nothing too threatening will appear in their path, the duo are undertaking a study of whip spiders—a creature that is both ancient and advanced, both creepy and fascinating.

Whip spiders have this uncanny knack for finding their way back to their home refuge, which is usually located in the buttresses of large tropical trees. Even with their relatively poor eyesight, even in the dark (since they are nocturnal), and even in the endless tangle of organic material that is heaped on the forest floor, with no trails or markings to show the way, they find home.

"They possess a remarkable navigational ability," said Bingman, a professor of psychology. "They have this site fidelity. They return to the same tree each time and you just wonder how they do it."

How they do that is an intriguing question, and it is the purpose of a research project the two professors have undertaken, in conjunction with colleagues from Nebraska and Arizona.

Read more: <http://www.bgsu.edu/news/2015/03/theres-no-place-like-home.html>



*Researching the whip spiders are Dr. Dan Wiegmann, biology graduate student Jake Graving and Dr. Vern Bingman*

## Circadian rhythm may play role in cancer treatment



*Curcumin, an element in the spice turmeric, is being looked at as a therapy for cancer patients. The BGSU lab of Dr. Michael Geusz is researching the effect of timing for optimizing effectiveness.*

Research being done in the BGSU lab of Dr. Michael Geusz is looking at curcumin as a therapy for cancer patients to determine if timing of treatment could optimize effectiveness.

Ashapura Sarma, a doctoral student in Geusz's lab, in partnership with colleagues at the University of Findlay's College of Pharmacy, is researching the anti-tumor effects of curcumin, an element in the spice turmeric. She is studying if curcumin's anti-tumor effects display any circadian rhythm.

Sarma's research has not yet appeared in journals; however, when she presented her work at the American Association for Cancer Research (AACR) meeting in the spring, she caught the attention of scientists and participants at the meeting. An article, summarizing the research to date, was published in the April 21 online edition of *The Scientist* magazine.

The idea behind the research is that tumors may keep time, similar to the way tissues in the body do, Sarma explained. The research showed that curcumin, which is able to activate a gene important to circadian rhythm, had an effect on rat glioblastoma cell cycles.

Using special software and a new confocal microscope with a camera, Sarma and the team photographed the curcumin-exposed rat glioblastoma cells every five minutes for five days. After looking at the time-lapse photographs and counting the cancer cells, they found treated cells had undergone more apoptosis, or cell death, compared to the controls. They also discovered there were more cell deaths at particular times, which Sarma commented "was very exciting."

As stated on their AACR poster, "Curcumin is most effective at inducing apoptosis of glioma cells at a specific phase of the circadian cycle." Research about the circadian clock's effect on cancer treatment has a lot of interest in the field, Geusz said. The team continues to look at the stability and viability of curcumin and whether there are certain times when cells are more resistant to harmful effects of cancer treatment. Rather than the Ayurvedic medicines, such as curcumin, the team may look at more traditional chemotherapies as they relate to the circadian clock.

*Dr. Hans Wildschutte (second from left) describes a technique to students (left to right) Kara Callahan, Winona Booher and Jade Borocz.*



### FIGHTING SUPERBUGS:

## Undergraduates join worldwide search for new antibiotics

The work of students in biologist Dr. Hans Wildschutte's microbiology lab class has taken on a special meaning this semester. While learning hands-on microbiology lab techniques, the students are also conducting research to identify potential new antibiotics.

The class is participating in the Small World Initiative, launched in 2012 at Yale University and aimed at discovering new antibiotics to treat the increasingly antibiotic-resistant bacteria threatening health globally. Because of the reluctance on the part of major pharmaceutical companies to develop novel antibiotics due to their low profitability, combined with the emergence of antibiotic resistance among human pathogens, the initiative was created to crowdsource antibiotic discovery by enlisting undergraduates worldwide.

"Over 40,000 undergraduates have participated spanning more than 109 universities," Wildschutte said. "The students are doing important and real microbiology research." Wildschutte revamped the Introduction to Microbiology course and adapted the Small World Initiative this year, making an important shift in the way his class is organized by tying the lecture portion directly to the lab work and the search for bacteria that may kill other, harmful strains.

"The lecture portion of the class and the lab portion were always disconnected and operated independently," he said. "I decided to make use of the Small World Initiative here at BGSU, which has been going for the last three years and proven a successful teaching strategy."

The search for "super killer bacteria" is also the focus of Wildschutte's own research, looking at the marine bacteria *Vibrio* as a possible source for new antibiotics.

The new class format has proven popular with students in the two course sections.

"This has definitely been my favorite lab class ever," said Ashley Everett, a sophomore from Toledo majoring in biochemistry. "I'm a pre-dental student, and I know that bacteria causes cavities and infections, so this is relevant to everyone. I like that we're putting into practice concepts we learn in our lectures."

The lab did not begin indoors with test tubes and known bacterial cultures, but instead outside in the dirt, where students collected soil samples to isolate and identify varieties of bacteria including *Bacillus* and *Pseudomonas*, which have been shown to produce nearly infinite varieties of diverse compounds including antibiotics that can inhibit human pathogen growth.

The students work only with safe, nonpathogenic strains, and try to develop mutants that will be used to identify genes encoding antibacterial products. Bacteria can be harmful to humans and other species, but they can also be deadly to one another, and that is the focus of their experiments.

Read more at: [www.bgsu.edu/news/2015/11/undergraduates-join-worldwide-search-for-new-antibiotics.html](http://www.bgsu.edu/news/2015/11/undergraduates-join-worldwide-search-for-new-antibiotics.html)



*Working in the lab are Mike Pelini, Audrey Maran, Cari Ritzenthaler and Rob Baroudi.*

## Invertebrates research takes team to Hawaii

Last January, members of the Pelini Lab at BGSU traveled to the Big Island, Hawaii, where they conducted research with soil invertebrates to study climate change effects.

The crew, comprised of Dr. Shannon Pelini, Audrey Maran (graduate student), Rob Baroudi (graduate student), Cari Ritzenthaler (undergraduate student), and Mike Pelini (lab manager) teamed up with investigators at the University of Hawaii and U.S. Forest Service to investigate the relationships between forest carbon cycling, climate, and soil invertebrates (millipedes, insects, etc.). They sampled the forest floor in nine sites along an elevational gradient ranging from 800 to 1600 meters above sea level (and the clouds, at the highest site).

Ritzenthaler is now a graduate student in the Pelini lab and is pursuing her master's work on interesting patterns related to invasive millipedes that the team found on their previous excursion.



*Dr. Shannon Pelini takes a close up look at soil invertebrates on the forest floor in Hawaii.*

*Participating in the Pelini Lab research in Hawaii were (from left) Cari Ritzenthaler, undergraduate student; Rob Baroudi, graduate student; Shannon Pelini; Audrey Maran, graduate student.*

## Butterfly Buffet

Student researchers seek optimal diet for monarchs



In a small, warm room in the Life Sciences Building, rows of white mesh tepees housing monarch butterflies are lined up on tables. The fabled, orange and black insects are carefully tended and monitored by BGSU conservation biology students **Paige Arnold**, a second-year graduate student from

Temperance, Mich., and **Matthew Zach**, a junior from Fairview Park, Ohio.

Every day, Arnold and Zach delicately unfurl the monarchs' tiny proboscises and place them onto simulated flowers with containers of nectar so they may drink in the sweet solution. The students make note of the butterflies' mating and the number of eggs they are laying on the milkweed leaves in their mesh homes. When those eggs begin to hatch, Zach will count and assess the caterpillars for how robust they are, and which develop most quickly.

All this activity, which has to happen within the butterflies' relatively short reproduction season, is

the subject of Arnold's research for her graduate thesis. Zach, who plans to become an entomologist, is also collecting data for his undergraduate research project. Both are students of **Dr. Helen Michaels**, biology.

### NSF provides more funds to boost STEM education

A joint initiative between BGSU and Owens Community College has received funding to expand Project SEA Change, focusing on STEM education.

Under the leadership of Dr. Moira van Staaden, the proposal to fund Project SEA Change was one of 700 projects seeking NSF funding. The five-year grant of more than \$3 million, will expand and institutionalize research-based instructional strategies and strengthen collaborative leadership among administrators and faculty in support of STEM education.

This initiative builds on the success of the Science, Engineering & Technology Gateway Ohio (SetGo) program, which was a prior NSF-funded collaborative venture. SetGo helped provide high-level undergraduate research experiences via BGSU faculty-driven initiatives such as computational mathematics and statistics, and constructive chemistry and biology.

Co-principal investigators with van Staaden include William Midden and Clare Barratt of BGSU, and Anne Bullerjahn of Owens Community College.

The goal of this new grant is to improve the quantitative literacy skills of undergraduate students in STEM courses. The project will widen implementation of high-fidelity research-based instructional strategies among faculty members and teaching assistants, improve social support for, and connectivity among, STEM transfer students from Owens Community College, and support the "emporium-style" learning model of math instruction that integrates self-paced computer instruction with on-demand, one-on-one tutoring by high-quality Teaching Assistants.

The research efforts embedded in the project will contribute to knowledge of effective approaches to organizational change that foster deeper student learning.

# Spring Break Hungary (2015)

By Dr. Robert Michael McKay, Ryan Professor



Spring break 2015 saw 10 BGSU students join biology faculty Mike McKay, George Bullerjahn and Vern Bingman on a memorable field trip to Hungary's Lake Balaton. Continuing from our recent successful spring break trips abroad to the German Baltic Sea coast, we decided to expand study abroad opportunities for students in the marine and aquatic sciences program to include freshwater environments. What started as an invitation

to McKay and Bullerjahn to visit the Hungarian Academy of Sciences Balaton Limnological Institute in January 2014 soon grew to a field course opportunity for BGSU students a year later.

Lake Balaton occupies an important position among the European Great Lakes and is the largest lake in central Europe. Located about 1.5 hours west of Budapest, Lake Balaton has many similarities to our own Lake Erie being shallow and having a watershed dominated by agricultural activity, especially viticulture. Also like Lake Erie, Balaton is an important seasonal tourist destination with abundant beaches and recreational fishing being a popular pastime.

Our trip started and ended in Budapest, often referred to as the "Gem of the Danube" and a cultural capital of central Europe. Having a day to acclimatize following our trans-Atlantic flight, most students took the opportunity to take in some sight-seeing including the impressive riverfront Hungarian parliament, St. Stephen's basilica, the Chain Bridge crossing the Danube and Budapest's massive Synagogue and remnants of the Jewish ghetto, stark reminders of human-rights atrocities committed during World War II. Our long travel day came to an end with a group meal at a "cellar pub" where we tried traditional Hungarian foods – the brave even tried fried brain – and were offered our first taste of pálinka, the fruit-brandy popular throughout the country.

The "field" component of the trip began on Sunday following our transit to the Balaton Limnological Institute (BLI) located on the Tihane peninsula jutting into the lake. The BLI is a collection of century-old Italianate villas located on the shores of Lake Balaton. Perched high on an ancient volcano overlooking the Institute is a Benedictine monastery dating to 1055. In all, truly a scenic location for our field course.

Activities during the course included a sampling cruise on the lake as well as sample processing and analysis using lab facilities at the Institute.



Participants in the Spring Break Hungary trip processed and analyzed samples using lab facilities at the Balaton Limnological Institute.

Our hosts also organized a visit to the aquarium in nearby Balatonfüred featuring local Balaton fish species, a visit to a subterranean river and a day trip to the Kis-Balaton Wetlands, an engineered wetlands constructed in the 1980's in response to increasing eutrophication in the lakes western basin from nutrients delivered by the Zala River. This drew analogies to eutrophication problems we experience in north-western Ohio with nutrient delivery from the Maumee River into Lake Erie's western basin and served to recognize the value of functional wetlands at reducing nutrient inputs. These wetlands also serve as an important migratory stop for birds and Professor Bingman (who teaches the BGSU ornithology class) used this opportunity to lead a session introducing students to birds of this region.

Cultural highlights of the trip to Balaton included a medieval dinner (no cutlery!) including a jousting exhibition at Sümeg Castle and a 5-mile hike across the Tihane peninsula traversing volcanic formations and ending at a local winery whose owners opened their facility specifically for our group. There we sampled local wines paired with regional delicacies including smoked carp and walleye filet.

On our way back to Budapest, we spent a night at the Kiskusági National Park famous for its soda lakes, ephemeral features important for migratory birds. Following a long day in the field, we returned to the park lodge where we feasted on goulash and learned how to play Tarok, a card game sharing some similarities with euchre and bridge.

One often hears that travel is not about the places you visit but about the people you meet. In this case we had both: scenic vistas, historic sites and wonderful hosts. Our hosts Boglárka Somogyi, Lajos Vörös, Károly Pálffy and Emil Boros and their colleagues from the BLI took care of all of our needs ranging from meals to transport and beyond. They were gracious hosts, introducing us to social customs and helping us to better understand what makes Balaton not only a large lake but a "great" lake. Professors McKay and Bullerjahn will continue to build upon the relationship with scientists at the BLI with a research trip in February 2016 related to ongoing winter limnology research at BGSU. Indeed, with ongoing collaborative research programs and the tremendous hospitality of our hosts at BLI, we hope to incorporate trips to Balaton as a regular feature of our spring break study abroad program.



At Lake Balaton in Hungary, faculty members and students in the marine and aquatic sciences program spent part of their spring break on a sampling cruise on the lake.

## Huber shares specialized skills for Harvard study

BGSU neuroscientist Dr. Robert Huber is sharing his expertise with colleagues at Harvard University as a Fellow of the Radcliffe Institute for Advanced Studies. Best known at BGSU for his research into the neurochemistry of behavioral phenomena such as aggression and addiction in crayfish, Huber also has specialized experience in computer vision, which he is applying to Harvard's quantitative behavioral study of *Drosophila*, or fruit flies.

"This is a relatively new field of computational ethology," Huber said. "It's an attempt to apply novel computer tools to describe, characterize and understand behavior."

Huber is training computers to automatically observe the insects in operant behavior chambers (Skinner boxes) and to automatically reward or punish their movements.

The sophisticated skills he gained as a young graduate student working for Apple when the first Mac computers were coming on the market have stood him in good stead as a neuroscientist, Huber said.

He has been collaborating with the Harvard scientists on refining their study, which has revealed previously unknown aggressive behavior among male *Drosophila*.

While at Harvard, Huber is continuing his investigations with the help of the graduate and undergraduate students who work in his BGSU lab. Along with studying the roots of addiction, he is researching the effects of psychostimulant drugs on the crayfish heart with BGSU collaborators Drs. Moira Van Staaden, biology, and Dr. Pat Sharp, psychology; and the behavioral



effects of new, synthetic drugs of abuse with Dr. Jon Sprague, director of the Center for the Future of Forensic Science.

Read more at [www.bgsu.edu/news/2015/04/aggression-and-addiction.html](http://www.bgsu.edu/news/2015/04/aggression-and-addiction.html)



From left: Dr. Dave Baker, Heidelberg University; Alumnus Dr. Greg Doucette, NOAA; Dr. Hans Paerl, The University of North Carolina at Chapel Hill; and Dr. Petra Visser, University of Amsterdam

## Water quality research gains international attention

Some of our faculty are helping to tackle the global phenomenon of toxic algal blooms. After an August 2014 "do not drink" advisory for more than 500,000 people in northwest Ohio, the issue gained national and international attention. A toxic algal bloom had polluted the water near Toledo's intake in Lake Erie. And Drs. George Bullerjahn and Robert Michael McKay, who were already involved in water quality research, became even more involved in the local issue.

In addition to doing active research, Bullerjahn and McKay helped organize an international workshop that featured top experts from around the world to discuss how to deal with the growth of harmful algal blooms. "Global Solutions to Regional Problems" was held on campus in April. The workshop was held in conjunction with the National Oceanic and Atmospheric Association (NOAA) and sponsored by the National Science Foundation. The goal was to discuss the current science on bloom formers, along with identifying knowledge gaps regarding bloom prevention and remediation.

Workshop presenters included: Boqiang Qin, Nanjing Institute of Geography and Limnology, China; Rainer Kurmayer, Universität Innsbruck, Austria; Hans Paerl, University of North Carolina; Steve Wilhelm, The University of Tennessee; and representatives from NOAA, the Environmental Protection Agency and Environment Canada.

In addition to the invitation-only workshop, the NOAA sponsored an open forum where future research priorities and current best practices were presented and public input was collected.

McKay and Tim Davis of NOAA have studied such nuisance blooms throughout the Great Lakes, especially bloom-forming cyanobacteria in western Lake Erie, Sandusky Bay and Grand Lake St. Marys in west-central Ohio. Their labs use molecular genetic techniques to track the origins and abundance of toxic cyanobacteria throughout the bloom (summer) season.

Read more about the research, the conference and its presentations at [www.bgsu.edu/chabworkshop](http://www.bgsu.edu/chabworkshop).

# A Colleague Retires

By Dr. Michael Geusz

In May of this year Dr. Roudabeh (Roudi) Jamasbi retired and ended her consistently active research program and dedicated teaching efforts lasting 33 years at BGSU. After arriving in 1981 from a research scientist position at the Oak Ridge National Laboratory to join the BGSU College of Health and Human Services as a young professor, Roudi was also appointed to a position in our department where she eventually trained nearly 30 graduate students.

One of her major research projects was a study of cancer cell surface epitopes that bind an anti-integrin monoclonal antibody she developed, which is now commercially available (Jamasbi, Kennel, and Stoner, 1992). A central interest of her lab has been human and rat esophageal cancer, which she examined through immunological approaches (Jamasbi, Stoner, Foote, et al., 2003). She also collaborated with Dr. Carol Heckman, and they shared a cell culture facility where many students were trained.

During the past seven years, I was able to work with Roudi and several of her graduate students in my lab and hers to complete various projects within her area of expertise: cancer and immunology. For me, it was an exciting sojourn from my work on the mouse brain, and our work eventually moved from esophageal and lung cancers to gliomas, and then to adult neurogenesis. Within these projects, we explored the remarkable abilities of curcumin, that yellow stuff in the spice turmeric, to kill cancer cells and, more selectively, the cancer stem cells harboring in tumors and cell lines that can escape from chemo treatments and regain an advantage through tumorigenesis. Simultaneously, my interest in authentic curries increased, along with other turmeric-laden foods.

Her professional training and her first advanced degree was at the University of Arkansas in Fayetteville. After completing her M.S. in microbiology, she found herself among a cohort of about 30 students in the microbiology Ph.D. program at Arkansas, of which only one other student was female. Her scores were near the top, and she soon began her postdoctoral training with Dr. Michael Hanna at Oak Ridge to examine non-tuberculosis mycobacteria for treating cancer. When her mentor left to join the NIH, she switched to the lab of Paul Nettesheim where she generated seven publications with a focus on cancer immunology. Later,



she helped train graduate students in the medical school at the nearby University of Tennessee along with Dr. Raymond Popp. At that time, the biological research component of the Oak Ridge Lab was in the mountains near Knoxville. In retirement her plans are to move back to the mountains of Tennessee. Before she takes that climb from the flatlands, be sure to stop by or drop her a note to wish her a long and satisfying retirement.

## Some of her published work

Jamasbi RJ, Kennel SJ, Stoner GD (1992) A monoclonal antibody produced against a rat esophageal carcinoma cell line reacts with an integrin-like molecule expressed by rat epithelial cells. *Hybridoma*. 5: 581-94. PubMed PMID:1459582.

<http://www.ncbi.nlm.nih.gov/pubmed/1459582>

Jamasbi RJ, Stoner GD, Foote LJ, Lankford TK, Davern S, Kennel SJ (2003) A monoclonal antibody to a carbohydrate epitope expressed on glycolipid and on alpha3beta1 integrin on human esophageal carcinoma. *Hybrid Hybridomics*. 6: 367-76. PubMed PMID: 14683596. <http://www.ncbi.nlm.nih.gov/pubmed/14683596>



*BGSU President Mary Ellen Mazey congratulates Nadejda Mirochnitchenko for winning one of the top poster presentation awards for her undergraduate research project.*

## Biology Poster Presentation Among Top Awards

BGSU student Nadejda Mirochnitchenko was one of the top three poster presentation winners at the Northwest Ohio Undergraduate Symposium for Research and Scholarship held in the spring on campus.

Her poster was "Chemical Contamination Suggests Rising Ecosystem Threat in the Portage River Watershed." Her faculty mentor was Dr. Kevin McCluney.

BGSU's Center for Undergraduate Research and Scholarship (CURS) and the Northwest Ohio Center for Excellence in STEM Education hosted the inaugural event. Students from BGSU and four regional partner institutions – the University of Toledo, Heidelberg University, University of Findlay and Ohio Northern University – presented.

During the awards presentation ceremony, BGSU President Mary Ellen Mazey said "What we find about students today is that it's all about being involved and being engaged, so undergraduate research and creativity projects are what it's all about.

"It's the future of this country and the future of higher education," she said.

The BGSU winners were recipients of CURS grants, and they were presented a hand-blown glass award created by BGSU faculty member Joel O'Doriso.



## Department **NEWS**

*Biological Sciences Department office staff members include (from left) Kelly Stewart, Patti Crawford-Mayo and Denise Holcombe.*

- **The Pasakarnis Buchanan Lecture** for 2015 was presented by **Dr. Tyrone Hayes**, about the impact of the herbicide atrazine in amphibian development. Hayes, an assistant professor of integrative biology at the University of California, presented "From Silent Spring to Silent Night: A Tale of Toads and Men."
- **Dr. Robert Michael (Mike) McKay**, Ryan Professor of Biological Sciences, was awarded the 2015 Olscamp Research Award for his work as a regional and national leader in the study of toxic algal blooms and on microbial communities in frozen lakes and the open sea. The award, given annually by the Office of Sponsored Programs and Research to a faculty member for outstanding scholarly achievements, includes a \$2,000 cash prize and a reserved parking sport for a year.
- **Dr. Hans Wildschutte** was awarded funding from the Cystic Fibrosis Foundation for his lab's continued drug discovery research to identify compounds that inhibit pathogenic bacteria.
- **Dr. Paul Moore** has written "The Hidden Power of Smell: How Chemicals Influence our Lives and Behavior." In the book, published in October by Springer International Press, Moore reveals the complex and vital role that smell plays in our everyday lives, our cultural understanding and our bodily functions. Read more at <http://www.bgsu.edu/news/2015/10/moore-book-reveals-wonders-of-our-sense-of-smell.html>.
- **The Biological Sciences Department** welcomed new staff members **Kelly Stewart** and **Denise Holcombe** in April 2015. Stewart, an alumna from the College of Education and Human Development is the office manager. She previously worked as an administrative assistant in the Department of Management in the College of Business Administration and was employed for 12 years in Human Resources. Holcombe joined the department as senior secretary after working 10 years as a grants accountant in Grants Accounting at BGSU. Her primary role is assisting graduate students with their progress through the M.S. and Ph.D. programs.



## Dr. Sheryl Coombs retires

By Dr. Paul Moore

Dr. Sheryl Coombs retired at the end of spring 2015, marking the end of a highly successful career at Bowling Green State University.

Coombs was one of the leading neuroethologists in the world who focused on hearing in fish. She spent her life studying the lateral line system of fishes across the world. She has published numerous papers, book chapters and edited books.

She is most noted for her work on the morphology and physiology of the hair cells that are involved in the detection of underwater sounds. In fact, this passion led to her receiving numerous grants from federal agencies, including the Department of Defense.

Coombs took this cutting-edge research and brought it into the classroom environment in her sensory ecology and neuroethology courses.

Her infectious enthusiasm and rigorous teaching have stimulated and trained a generation of students. Her retirement plans include completing research projects and working at her farmhouse in Bowling Green.



## Alumnus earns NSF grant to develop ontology

BGSU alumnus Dr. Marcus Chibucos was awarded a \$1.4 million dollar three-year grant from the National Science Foundation (NSF) Advances in Biological Informatics program to develop an ontology of scientific evidence. At the University of Maryland School of Medicine's Institute for Genome Sciences, Chibucos and his co-investigator Dr. Michelle Giglio, are developing the Evidence Ontology (ECO), a controlled vocabulary used by scientific researchers to describe evidence in scientific investigations.

Researchers rely on scientific evidence originating from diverse methods—including laboratory experiments and computer-based analyses—to make inferences and support conclusions. In order to be useful to the broader scientific community, published conclusions and their supporting evidence must be extracted from the literature (called biocuration) and stored in a database where they become searchable by computers. Ontologies facilitate this process. An ontology is a kind of controlled vocabulary, like a thesaurus, where each term is precisely defined—but where terms have defined relationships to other terms, for example a “leaf” is “part of” a “tree.” When data are tagged (annotated) with ontology terms they can be searched and sorted by a computer via traversing the ontology's hierarchical structure.

The number of published scientific findings continues to grow exponentially, making computational approaches to data management essential. This NSF award supports development and dissemination of the Evidence Ontology. It will be promoted through outreach, training and education efforts, including workshops and internships. Broader impacts include outreach efforts to local Baltimore area students focusing on teaching the importance of structuring information in a controlled way. Summer interns will engage in development and bioinformatics activities.

Chibucos completed his Ph.D. at BGSU in 2004 in the lab of Dr. Paul Morris, where he studied polyamine transporter enzyme kinetics in zoospores of the soybean pathogenic oomycete *Phytophthora sojae*. During his postdoctoral fellowship at the Virginia Bioinformatics Institute, he studied comparative genomics of filamentous pathogens and developed the Gene Ontology to describe plant-microbe interactions. He joined the Institute for Genome Sciences in 2008 as a bioinformatics analyst and in 2012 became research faculty in the Department of Microbiology and Immunology. He has developed biological ontologies and performed genome annotation & analysis on a wide range of pathogenic microbes including fungi, oomycetes, bacteria, and Apicomplexans. Since 2006 he has regularly taught at Oomycete Molecular Genetics Network workshops held at Virginia Tech, where he enjoys meeting undergraduate students of Dr. Vipaporn Phuntumart (biological sciences) and his mentor Dr. Morris.

## Deb McLean earns her freedom!

By Dr. George Bullerjahn



After 25 memorable and excellent years of service as executive assistant in the Department of Biological Sciences, Deb McLean is enjoying a well-deserved retirement. I can't say enough about the important role Deb played throughout my time at BGSU, most notably during my brief time as department chair. Her daily assistance to the chair was invaluable, as she knew the roles of virtually all

staff on campus and how staff members in different units could help us. Through her institutional awareness, she helped me spot issues and administrative problems before they arose. Deb's understanding on how the university administrative staff operated gave me insights into how to solve problems as they pertained to course scheduling, college deadlines and faculty hiring procedures. If not for Deb's help, I would not know how to do anything on time given the daily demands coming to the department from the college and the provost's office. Deb helped me navigate all these turbulent waters with good cheer and humor throughout. She put the needs of the department first in everything she did, and for that we should all be most grateful.

Deb McLean is a lifelong Falcon, class of 1980, who first started as administrative assistant in what's now known as the School of Media & Communication (Radio/TV/Film). Luckily for us, she made the switch to biology after 10 years, where she served with great distinction until this year. Deb will devote her retirement years to her three sons and their families as she awaits the arrival of grandchild #3 this fall. She and Mac continue to reside in Bowling Green, where she routinely goes to lunch with old guard faculty like me. It's great to see Deb enjoying life after BGSU biology, as much as we miss her!

# Bio:Life

## Biological Sciences Scholarship and Award Recipients

Following is the list of scholarship recipients for 2015-16. This list includes awards for graduating seniors. Congratulations to these outstanding students and special thanks to our donors!

To view scholarship criteria, please visit: [www.bgsu.edu/arts-and-sciences/biological-sciences/undergraduate-programs/scholarships.html](http://www.bgsu.edu/arts-and-sciences/biological-sciences/undergraduate-programs/scholarships.html)

**Alpha Epsilon Delta Award**  
Not awarded

**Beta Beta Beta Award**  
Amber Gombash (Delta, OH)

**Biology Alumni Freshman Scholarship**  
(incoming freshmen)  
Lydia Lawrence (Maumee, OH)

**Biology Alumni Sophomore Scholarship**  
Shannon Turner (North Ridgeville, OH)  
Emily Witt (Grafton, OH)

**Jean Pasakarnis Buchanan Scholarship**  
Kayla Effinger (Carmel, IN)  
Julie Emmert (Massillon, OH)  
Nicole Gordon (Perrysburg, OH)  
Jamie Justice (Lucasville, OH)  
Zachary Morris (Delphos, OH)  
Hallie Zimmer (Cambridge, OH)

**T. Richard Fisher Biology Scholarship**  
Catherine Freed (Wooster, OH)  
Nadejda Mirochnitchenko (Oregon, OH)

**James D. Graham Memorial Scholarship**  
Elizabeth Glasgo (Williamsburg, OH)  
Neisha Medina (Lorain, OH)

**Ralph V. McKinney, Jr. – Eloise Whitwer Scholarship**

Maggie Caswell (Uniontown, OH)  
Ariana Groce (Columbus, OH)  
Scott Heidler (Hudson, OH)  
Danielle Kemp (Alliance, OH)  
Nadejda Mirochnitchenko (Oregon, OH)  
Maya Skorupski (West Chicago, IL)

**Suzanne K. Miller Undergraduate Research Assistantship**  
Alec Brown (Beachwood, OH)  
Erica Eskins (Clyde, OH)  
Hannah Scheppler (Defiance, OH)  
Jillian Wray (Lowell, MI)

**Barry R. Morstain Scholarship in Biology**  
Mary Scott (Maumee, OH)  
Rachel Wilson (St. Clair Shores, MI)

**Multicultural Student Scholarship**  
Malika Day (Huber Heights, OH)

**Linda and Larry Oman Scholarship**  
(graduate students)  
Richard Budnik (Bowling Green, OH)  
Matthew Cross (Bowling Green, OH)  
Sarah Wofford (Bowling Green, OH)

**Myra L. Patchen Biology Scholarship**  
Andrea Fisher (Springboro, OH)

**Dawson S. and Sylvia A. Patterson Scholarship**  
Joseph Basalla (Lakewood, OH)  
Jocelyn Williams (Leesburg, GA)  
Jillian Wray (Lowell, MI)

**Robert C. Romans Biology Scholarship**  
(incoming freshmen)  
Ciara Digby (Tiffin, OH)  
Katelyn Lang (Bowling Green, OH)  
Hannah Tomor (Oak Harbor, OH)

*Oman Scholarship recipients are (from left) Matthew Cross, Sarah Wofford and Richard Budnick.*



**Joseph J. and Marie P. Schedel Scholarship**  
Sarah Bail (Springfield, OH)  
Renee Dollard (Brecksville, OH)  
Erica Eskins (Clyde, OH)  
Jamie Justice (Lucasville, OH)

**Steven S. Steel Scholarship**  
Tia Gustafson (Beavercreek, OH)

**Waldo and Evelyn Steidtmann Scholarship**  
Molly Beattie (Bowling Green, OH)  
William Gyurgyik (Cleveland, OH)  
Stephanie Romeo (Youngstown, OH)  
Hannah Scheppler (Defiance, OH)  
Carina Weed (Ashtabula, OH)

**Cynthia Collin Stong Marine Biology Scholarship**  
Lindsey Cunningham (Bowling Green, OH)  
Tia Gustafson (Beavercreek, OH)  
Stephanie Maiorano (Clayton, OH)  
Ann Ropp (West Bloomfield, MI)  
Sadie Slamka (Middletown, OH)

**Harold E. Tinnappel Scholarship**  
Stephanie Maiorano (Clayton, OH)  
Manda Robey (Martins Ferry, OH)

**Dennis R. Whitmore Memorial Scholarship**  
Katherine Bland (Mason, OH)  
Alec Brown (Beachwood, OH)

## Biological Sciences Scholarships

Visit [www.bgsu.edu/biologyscholarships](http://www.bgsu.edu/biologyscholarships) for a list of funded scholarships that are available to our undergraduate and graduate students thanks to the generous contributions of alumni, friends and other donors. We thankfully accept donations to any of these scholarships for the assistance of our students.

# October 2014 – October 2015 Alumni/Retired and Current Faculty/Staff/Friends Contributions (\$26,970)

Again this year we want to recognize and thank our donors for their generous contributions. If you have provided a monetary gift to the Department of Biological Sciences and are not listed below, please let us know and we will include it in the next newsletter.

## Biological Sciences Scholarship/General Activities Fund

David Alderfer  
 Carol Augspurger  
 Edwin Bartholomew  
 Joe/Betty Becker  
 Anne Benjamin  
 BP Foundation (Eric Schwamberger match)  
 Dale/Vicki Bowlus  
 Glen/Lareen Bowman  
 David Braun  
 Greg/Karen DeCamp  
 Henry/Alyssa Gomes  
 Robert/Anne Graves (Scholarship fund)  
 Eric/Elizabeth Hanson  
 Terry/Janice Hufford  
 Richard Lyman  
 Barbara Masters  
 Debra McLean  
 Lisa/Dale Merritt  
 Mark/Frieda Mondl  
 Mary Ann Roach  
 Mary Rupnow  
 Mark/Laura Seeger  
 Robert/Karen Weiland  
 Paul/Gerda Woner  
 Lamar/Sondra Zigler

## Biology Alumni Sophomore Scholarship

Carol Augspurger  
 Keith Camburn  
 Paul Dahlhauser  
 Judith Downing  
 Diego Grinberg-Funes  
 Michael Keffer

## Electron Microscopy Center

Edward Durbin

## T. Richard Fisher Biology Scholarship

Robert Brodberg  
 Clarence/Marjorie Smith

## James D. Graham Memorial Scholarship

Gregg Gehring  
 Fred/Jaclyn Hendicks  
 David McCormick  
 Thomas/Virginia McQuiston

## Marine Lab Operations Fund

Patricia Biesiot  
 John Bucklew  
 Phyllis Evans  
 Gallagher-Seliskar Giving Acct. of the Fidelity Charitable Gift Fund  
 Ronald/Janet Partin  
 Rhys Richards  
 The Procter & Gamble Fund of the Greater Cincinnati Foundation

## Barbara Long Masters Biological Sciences Research Fund

Barbara Masters

## Myra L. Patchen Biology Scholarship

Ehren Chiropractic Center  
 Gregg Gehring

## McKinney-Whitwer Biological Sciences Scholarship

Patricia Bauer

## Dr. Suzanne K. Miller Undergraduate Research Assistantships

Kenneth/Suzanne Miller-Kobalka

## Robert C. Romans Biology Scholarship

Robert Brodberg  
 Lee Meserve  
 Terry/Phyllis Morrow  
 John/Bonnie Mucha  
 Daniel O'Connell  
 John/Paula Parrish  
 Jean Romans (in memory of Dr. Robert Romans)  
 Brent/Carla Takemoto

## Cynthia Collin Stong Marine Biology Scholarship

Patricia Biesiot  
 The Procter & Gamble Fund of the Greater Cincinnati Foundation

## Cynthia Collin Stong Marine Lab Operations Endowment Fund

Cynthia C. Stong

## Dennis R. Whitmore Memorial Scholarship

Julie Comatas  
 Catherine Sommer  
 Richard/Violet Whitmore

## Make a gift today

Name \_\_\_\_\_ Year of Graduation \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Signature \_\_\_\_\_

Credit card # \_\_\_\_\_

Expiration date \_\_\_\_\_

Visa  MasterCard  Discover

**Return to:** Bowling Green State University, Department of Biological Sciences, 217 Life Sciences Bldg., Bowling Green, OH 43403-0208

Enclosed is my contribution of:

- \$25
- \$50
- \$100
- Other \$ \_\_\_\_\_

My gift is designated for:

- Scholarships (indicate fund)
- New Equipment
- Department General Fund
- Marine Lab Operations Fund

**Note:** Make checks payable to BGSU Foundation Inc., Dept. of Biological Sciences



# Bio:Life CONTRIBUTORS

George Bullerjahn	Shannon Pelini
Marcus Chibucos	Moira Van Staaden
Mike Geusz	Kelly Stewart
Mike McKay	Tamera Wales
Jeff Miner	Hans Wildschutte
Paul Moore	



*Drs. George Bullerjahn and R. Michael McKay traveled to Hungary with a group of BGSU students during spring break 2015 to study water quality in Lake Balaton, a freshwater lake in Hungary. Read the story on page 5 of the Fall 2015 Bio: Life newsletter.*



*BGSU's Dr. Robert Huber is best known for his research into the neurochemistry of behavioral phenomena such as aggression and addiction in crayfish; currently he is sharing his expertise at Harvard University. His story appears on page 7.*

## **Please... Let us hear from you!**

Your full name: \_\_\_\_\_  
(Include maiden name if appropriate)

Address: \_\_\_\_\_

Graduation year(s): \_\_\_\_\_

Degree(s): \_\_\_\_\_

Place of employment: \_\_\_\_\_

Job title and/or job description: \_\_\_\_\_

Appropriateness of BGSU training for this position: \_\_\_\_\_

What might be added to better prepare current students for positions such as yours?  
\_\_\_\_\_

Would you and/or your firm be willing to sponsor, if appropriate, undergraduate internships? Circle:    Yes    or    No

If yes, indicate name, address and email address of contact person: \_\_\_\_\_

Most memorable moment at BGSU: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## **BGSU**

**Bowling Green State University**  
Department of Biological Sciences  
217 Life Sciences Building  
Bowling Green, Ohio 43403-0208