

BIOLOGICAL SCIENCES NEWSLETTER



Fall 2013 Volume 2, Issue 1



HIGHLIGHTS FOR Fall 2013

- Biology students awarded \$11,500 in research funding from the College of Arts and Sciences Dean's Office.
- The biology major is changing! New curriculum shifts greater focus toward scientific skills. Look for updates in the spring 2014 newsletter.

PROFESSOR JOELLA KILLIAN WINS 2013 GRELLET C. SIMPSON AWARD

For 29 years, Professor **Joella Killian** has been serving up a steady diet of insects, cephalopods, and intestinal parasites with tremendous skill and boundless enthusiasm, much to the delight of her students. Her excellence in the classroom was recognized with the university's highest undergraduate teaching honor, the Grellet C. Simpson Award. She received the award during the May, 2013 graduation ceremony. According to former student and advisee **Sarah Hagan, Class of 2011**, "Students can't help getting wrapped up in her lectures, whether they're about mitosis, cockroaches, or nasty parasitic worms. She is an engaging lecturer, tough tester, and as fair as they come. She

has had a positive and lasting impact on my life, and I feel that no one is more deserving of recognition." **Cole Eskridge, Class of 2013** and current University of Arizona Ph.D. student, commented: "She's been a role model for me since my first semester of college as to what a successful teaching career looks like, and still inspires me in many of my graduate-level endeavors in insect science." The award is named after a former president of Mary Washington, who was well known for his support for liberal arts education and dedication to the institution's teaching mission. Dr. Killian covers such courses as invertebrate zoology, entomology, parasitology, and introductory biology.



Provost Newbold presents the Simpson Award to Dr. Killian during the 2013 graduation ceremony.

She is also the Biology Club's faculty advisor. In addition to her fondness for all things spineless, she is an avid and knowledgeable birder who frequently participates in the National Audubon Society's Christmas Bird Count and leads bird watching field trips for the Friends of the Rappahannock. Congratulations, Dr. Killian!

MICHAEL CARLO WINS 2013 WILLIAM A. CASTLE OUTSTANDING SENIOR AWARD

The department's faculty recognized **Mike Carlo, Class of 2013**, with the William A. Castle Outstanding Senior Award in May. Mr. Carlo came to Mary Washington as a transfer student from the Virginia Community College System. His transition was seamless, earning nearly perfect grades and jumping right into independent research. His research project culminated in a departmental honors thesis, co-advised by Dr. Andrew Dolby and Dr. Deborah O'Dell. His project examined relationships among various physiological stress indicators in birds, such as corticosterone, heat shock proteins, and leukocyte counts. "Mike was one of those rare students who con-

sistently took complete charge of his own research progress. Instead of asking me what he needed to do next, he would come to me with his own ideas. He also volunteered for some painfully early field work sessions," commented Dr. Dolby, who also served as Mike's academic advisor. Mike presented his data, which he collected with research partner Abby Kimmitt, at the Wilson Ornithological Society's Annual Meeting last spring. Mr. Carlo is now enrolled in a Ph.D. program at Clemson University, working in the laboratory of Dr. Michael Sears. He is pursuing his interests in vertebrate thermoregulatory physiology and looking forward to beginning his duties



Mike Carlo with a Tufted Titmouse, the subject of his Biology Honors research.

as a graduate teaching assistant for Clemson's Biology Department. In addition to his academic accomplishments, Mike married his fiancé, Amy, in June, and the happy couple wasted no time starting a family, adopting an energetic new Labrador retriever puppy. Congratulations, Mike, and best of luck with your graduate studies!

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2013-14 DEPARTMENT SCHOLARSHIP WINNERS:



Yoshi Takeda, Stuart Scholarship winner, checks for turtles in the Fredericksburg Canal.



Dan Browne, Biology Scholarship winner, sporting flashy fish tie.

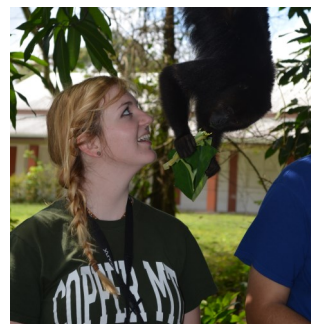
Each year the department awards one Rebecca Culbertson Stuart Scholarship and two Biology Scholarships. Each scholarship is worth about \$3,500, and recipients are chosen by the faculty based on their grade point averages, extracurricular activities, and educational and career aspirations.

Yoshinori (Yoshi) Takeda won the Stuart Scholarship. He is double-majoring in biology and physics, with two minors in chemistry and applied mathematics! The neural circuitry of the nervous system inspired his joint interest in both biology and chemistry. His Summer Science Institute experience, however, provided an unexpected twist: turtle population surveys in the Fredericksburg Canal with Dr. Werner Wieland. This project tested both Yoshi's mathemati-

cal and boat-handling skills! He is working toward a career in medicine and aspires to work for a relief organization such as Doctors Without Borders.

Daniel Browne and **Alexis Pennings** were awarded the two Biology Scholarships. As a UMW student, Dan was first inspired by Phage Hunters, which allowed him to learn biology while participating in the discovery process. He has since been working on research in Dr. Grana's nematode lab, and he participated last summer in an internship at the University of California-San Diego involving the application of bioinformatics in diabetes research. He hopes to earn a Ph.D. and pursue his own career in diabetes research. According to Mr. Browne, "Science is a part of my life now, and I intend for it to stay that way."

Alexis has always been drawn to animals. As a child, she helped raise farm animals for livestock shows, and as a college student, she cared for snakes, frogs, and turtles at Steele Creek Nature Center in Tennessee, was a veterinary intern at a zoo in Texas, and won a scholarship funded by the **Larry G. Valade family** to study wildlife medicine in Belize. Alexis aspires to attend veterinary school and earn a Ph.D. studying zoonotic diseases. She is also interested in popular science writing and engaging the public in science.



Alexis Pennings, Biology Scholarship recipient with howler monkey friend in Belize.

"Science is a part of my life now, and I intend for it to stay that way".
—Dan Browne

FALL 2013 UNDERGRADUATE RESEARCH GRANT WINNERS:

The following students were awarded research funding from the College of Arts and Sciences Dean's Office for their fall semester projects. Research proposals were developed as part of the requirements for BIOL 481, *Readings in Biology*. These awards are for research supplies and equipment. Students may also apply for funding for travel to scientific conferences to present their data.

- **Dan Browne** - Nematodes as a vehicle for undergraduate education. - \$325 (Mentor: Dr. Theresa Grana)
- **Ariel Davati** - Study of age and gender effects on lipoprotein size and concentration. - \$920 (Mentor: Dr. Kathy Loesser-Casey)
- **Jessica Dochney** - Species description of *Caenorhabditis* sp. 8. - \$810 (Mentor: Dr. Theresa Grana)
- **Sarah Marzec** - Nematode population diversity at a native pawpaw site.- \$700 (Mentor: Dr. Theresa Grana)
- **Lindsay Raulston** - Effects of atrazine on gene expression in *Danio rerio*. - \$4,000 (Mentor: Dr. Dianne Baker)
- **Yoshinori Takeda** - Effects of microwave radiation (10.1 GHz) on NIH/3TS fibroblasts. - \$4,000 (Mentor: Dr. Rosemary Barra)
- **Thikiri Yee** - Isolation of potential antimycobacterial chemicals from soil.- \$765 (Mentor: Dr. Lynn Lewis)

BIOLOGY WITHOUT BORDERS (GOING GLOBAL)

Sarah Eubanks spent 13 weeks working with a Ph.D. student in **Lübeck, Germany** at the Universität zu Lübeck Institut für Molekulare Medizin. She conducted assays that included the proteins PACT and TRBP in the RNA-induced Silencing Complex (RISC). These RNA-binding proteins bind directly to Dicer and effect the efficiency of the production and size of short double-stranded RNA fragments. Specifically, she focused on the functional results with the addition of the protein PACT under varying conditions.

Dr. Dianne Baker spent six weeks as a guest researcher in

the lab of Dr. Finn-Arne Welzien of the Norwegian School of Veterinary Science in **Oslo, Norway**. She contributed her expertise to develop an *in situ* hybridization protocol to map expression of neuropeptide-encoding genes regulating development and reproduction in the model teleost fish, *Oryzias latipes* (medaka).

Dr. Steve Fuller led yet another spring break field trip to Central America as part of his Tropical Ecology course. The class visited **Belize** and **Guatemala** this year. On the itinerary were the Mayan ruins of Tikal and Crooked Tree Wildlife Sanctuary. Dr. Fuller's trips continue to have lasting

impacts on his students. **Samantha Luffy, Class of 2011**, for example, spun her class's trip to **Costa Rica** into an internship at Campanario Biological Reserve after she graduated from UMW. She is now a Master's degree student in Emory University's global health program.

The department continues to expand its global reach.



Tropical Ecology students visit Tikal during spring break trip with Dr. Fuller.

"It [Tropical Ecology trip] was a truly wonderful experience that I believe helped me be accepted into the Global Health Masters Degree program at Emory University!" -Samantha Luffy, Class of 2011

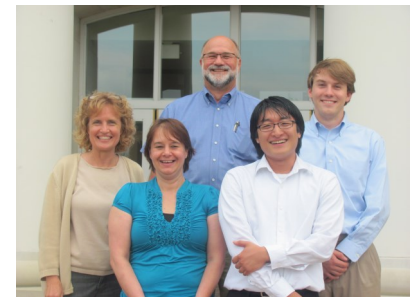
BIOLOGY RESEARCH PROGRAM HAS PRODUCTIVE SUMMER

Between the Virginia Academy of Sciences (VAS) Annual Meeting in May, and the Summer Science Institute, UMW students and faculty had a busy summer! Twelve biology students and seven faculty presented research at the VAS meeting held at Virginia Tech. **Dr. Deborah O'Dell** was elected President of the VAS, and six other faculty fulfilled various other leadership responsibilities. The relationship between the department and VAS continues to be an important one, with the VAS providing a venue for students to share their research, while our faculty furnish leader-

ship manpower to maintain the VAS's operations.

The department also fielded two Summer Science Institute research teams. **Kathy Belrose-Ramey** worked with **Dr. Deborah Zies**, and her work aims to clarify the interaction between the RAI1 transcription factor and the CLOCK gene and its possible role in producing the effects of Smith-Magenis Syndrome. Belrose-Ramey won second prize for her oral presentation during the end-of-summer SSI Symposium. **Yoshi Takeda** and **Bryan Finch** were mentored by

Dr. Werner Wieland. Yoshi continued his turtle survey of the Fredericksburg Canal, while Bryan studied wildlife diversity at Eagle Lake Outpost using remote wildlife cameras set up in a grid. Eagle Lake Outpost is a 200-acre wooded property in southern Stafford County owned by the university and dedicated to scientific field research. In addition to the expected white-tailed deer and gray squirrels, Bryan's cameras picked up shots of coyotes, black bear, and wild turkey. Dr. Zies is co-director of the SSI program.



The Summer Science Institute's biology contingent. (Left to right: Dr. Debbie Zies, SSI Co-Director; Kathy Belrose-Ramey, 2nd prize presentation winner; Dr. Werner Wieland; Yoshi Takeda; Bryan Finch).

Faculty Notes

- **Theresa Grana** co-authored a paper titled "A genome-wide functional screen identifies MAGI-1 as an L1CAM-dependent stabilizer of apical junctions in *C. elegans*," which appeared in the journal *Current Biology*.
- **Alan Griffith** had a paper accepted for publication by the *Natural Areas Journal* titled "Secondary dispersal in *Aeschynomene virginica*: do floating seeds really find a new home?"
- **Mike Killian** and **Dianne Baker** co-authored a paper "Corralling wiggling worms-collecting data for a multi-week laboratory on the effect of various treatments on the pulsation rate of the dorsal vessel of California blackworms (*Lumbriculus variegatus*) published in the Proceedings of the 34th Conference of the Association for Biology Laboratory Education.
- **Deborah O'Dell** was elected President of the Virginia Academy of Science (VAS).
- **Deborah Zies** won a grant from the VAS for her project "Cloning and characterization of the human RAI1 promotor."

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SPECIAL THANKS TO OUR RECENT UMW FOUNDATION DONORS:

- Gina D'Eramo, Worchester, MA
- Roberta Newton, Greensboro, NC
- Elizabeth Smith Storm, Fredericksburg, VA
- Dr. Mary Ring Williams, Lansdowne, VA
- UMW Elderstudy

The mission of the biology program at the University of Mary Washington is to provide a strong undergraduate education in the fundamental principles of biology and train students in the basic research methods and techniques used by biologists. The program is designed to prepare undergraduates for future careers in basic life sciences research, teaching and related professions, medicine, dentistry, and other allied health fields.

For further information about the biology program, please contact Andrew Dolby, Chair, Department of Biological Sciences, at adolby@umw.edu or 540-654-1420



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Questions about this newsletter? Contact the content creator and editor: Andrew Dolby at adolby@umw.edu

UPDATE FROM DR. COLBY CROFT, M.D. DISTINGUISHED ALUMNUS, CLASS OF 2008

I graduated from the University of Pittsburgh School of Medicine in May, and I am happy to report that my education at UMW has proved invaluable in supporting my success in medical school. The biological principles that I learned in my courses gave me a solid foundation of knowledge from which to grow during the inundation of information that is medical school. In addition, the study skills that I honed at UMW in order to keep up with the demanding course load of a Biology major made the transition to medical school surprisingly smooth.

My research experiences with Drs. Baker and Tomba at UMW allowed me to immerse myself in the scientific method. This helped me learn to critically evaluate scientific literature—an

essential skill for a physician. Also, these activities made me a much more competitive medical school applicant. It is unusual for students at larger institutions to be able to design their own research projects, and I am so grateful that I had these opportunities at UMW.

This past March I learned that I matched at my first choice for residency—Psychiatry at the University of California, San Francisco. I am proud to say that the phenomenal teaching, advising, and mentorship that I was so fortunate to have at UMW have contributed hugely to my successes since college.



Dr. Colby Croft, M.D., University of Pittsburgh School of Medicine. 2013.

"I am happy to report that my education at UMW has proven invaluable in supporting my successes in medical school."
