BIOFEEDBACK

THE NEWSLETTER OF THE BIOLOGY DEPARTMENT AT RHODES

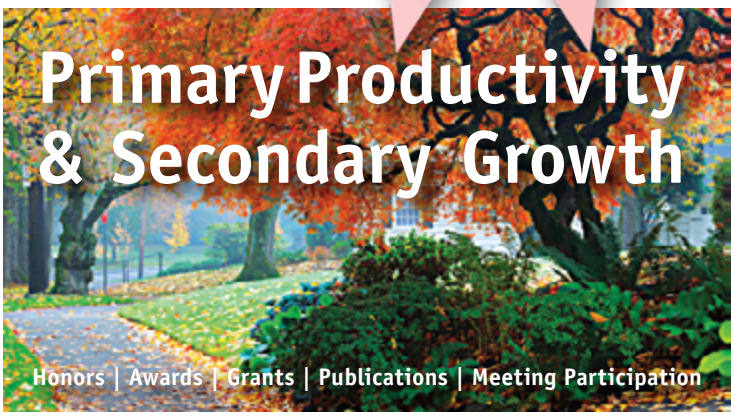
VOLUME 33 OCTOBER 2018 NUMBER 1

The Chair's Niche

Mary Passmore '17 was a Biology major in the fall of her senior year when she noticed a lump in her breast. Unfortunately, Mary's initial attempts to seek medical care did not go smoothly because of her youth and apparent good health. Finally, she got an appointment with a Planned Parenthood physician who confirmed that there was a serious problem, and she was diagnosed soon after with aggressive Stage 2 breast cancer.

Mary took a medical leave from Rhodes, but she managed to finish her courses at home in Arkansas while she underwent the grueling experience of surgery and chemotherapy. This allowed her to share with family and friends the joyous goal of graduating with her classmates in May, 2017. Mary graduated cum laude with a B.S. in Biology and a minor in Religious Studies. She had been accepted into the University of Arkansas School of Pharmacy, but sadly, never had the chance to use her Rhodes degree or follow through on her plans to become a pharmacist. Mary's cancer progressed swiftly and in spite of months of treatment at a renowned cancer center, Mary died of stage 4 breast cancer on September 5, 2018.

This issue of Biofeedback is dedicated to Mary Passmore. In her memory we urge you to treat one another with respect and kindness. **Dr. Carolyn Jaslow, Chair**



HONORS AND AWARDS
Congratulations to:

Erin Burman '18 Award for Excellence in Biology

Caroline Bush BIOM '19 received a Goldwater Scholarship for 2018-2019

Julia Cherry '99 was promoted to the position of Professor at the University of Alabama

Conor Dorian NEUR '18 Hunter Award for Excellence in Neuroscience

Hope Elliot ENVS '18 Senior Award in Environmental Sciences

Katie Gaffney '21 Award for Excellence in First-Year Biology

Erin Gleeson ENVS '18 awarded The Steve and Riea Lainoff Crop Fellowship

Helen Hope ENVS '18 Senior Award in Environmental Studies

Lauren Hamm '19 Award for Outstanding Research in Biology

Ellery Hayden NEUR '18 Award for Outstanding Senior in Neuroscience

Anuradha Iyer ENVS '20 Sophomore Award in Environmental Studies

Samantha Lamy NEUR '18 has been commissioned as second lieutenant in the United Starts Army

Marilyn Long ENVS '19 Rosanna Cappellato Award, Environmental Science

Jenny Loome BMB '18 Award for Outstanding Senior in BMB

Pryce Michener '17 has been offered a Medical Scientist Training Program (MSTP) award

Sarah Morris BMB '18 Award for Outstanding Senior and for Outstanding Research in BMB

Ally Nawrocki ENVS '20 Sophomore Award in Environmental Science

Alisa Redding ENVS '18 recipient of a Fulbright U.S. Student Program grant

Hamid Shirwany BMB '19 selected for the Mertie W. Buckman International Internship Program, traveling abroad to Rabat, Morocco

Ashley Truong BMB '16 has been offered a Medical Scientist Training Program (MSTP) award

Katie Tucker '21 won a scholarship from the Memphis Horticultural Society to attend and present at the 2018 Native Plant Conference October 26-27 in Memphis.

Gary Lindquester was appointed Associate Provost for 2018-2019.

BIOFEEDBACK is published each semester. Please submit any content you wish to include to Dr. Carolyn Jaslow, cjaslow@rhodes.edu.

New Omicron Delta Kappa honor society members:

Pooja Dave NEUR '19, Robert DelBello '18, Garrett Durbin '18, Hope Elliott ENVS '18, Elizabeth Gaudio NEUR '19, Candace Hayes BMB '19, Arati Joshi '19, Layla Jubrial-Jaber '19, Rachel Myers '18, Alisa Redding ENVS '18, Patrick Smith BMB '18

New Mortar Board Honor Society members:

Pooja Dave NEUR '19, Elizabeth Gaudio NEUR '19, Lauren Hamm '19, Candace Hayes BMB '19, Arati Joshi '19, Tanner Martinez BMB '19, Erika McCormick '19, Jacob Menke BMB '19, Hamid Shirwany BMB '19, Matthew Smith BMB '19, Reece Stevens BMB '19, Allison Young '19

New Phi Beta Kappa society members:

Rachel Bassett '18, Erin Burman '18, Robert DelBello '18, Garret Durbin '18, Ellery Hayden NEUR '18, Jenny Loome '18, Aidan O'Reilly '18, Mac Williamson BMB '18

Grants and Fellowships

Gary Lindquester. Faculty Development Endowment Grant, Summer 2018: Mechanisms of Immune Evasion: The Role of an Immunosuppressive Signaling Molecule in Herpesvirus Infection

Mary Miller. National Science Foundation 15-527 RCN-UBE: Yeast Orphan Project: Finding a place for ORFans to GO. $485,852.00 funding over five years to support workshop training for faculty to incorporate research approaches in the teaching laboratory. (Senior Personnel/ Workshop Coordinator). Ends Summer 2021.

Mary Miller. National Science Foundation 13-520 RCN-UBE; Bridging the divide between research and education with authentic research experiences in introductory biology. $499,744.00 funding over five years to support workshop training for faculty to incorporate research approaches at the level of introductory biology laboratories (workshop facilitator). Ends Summer 2019.

Publications

Fecchi A, Pinheiro R, Bell J, Felix G, Faria I, Pinho J, Braga E, Farias I, Tkach V, Aleixo A, **Collins M**, and Weckstein J. 2018. Host community similarity and geography shape the diversity and distribution of haemosporidian parasites in Amazonian birds. *Ecography*. 41:505-15. https://doi:10.1111/ecog.03058

Fecchio A, Bell J, **Collins M**, Farias I, Trisos C, Tobias J, Tkach V, Weckstein J, Ricklefs R, and Batalha-Filho H. 2018. Diversification by host-switching and dispersal shaped the diversity and distribution of avian malaria parasites in Amazonia. *Oikos*. 127:1233-42. https://doi.org/10.1111/oik.05115

Ellis V and **Collins M**. 2018. Temporal changes in abundance exhibit less spatial structure than abundance itself in North American birds. *Journal of Ornithology*. https://doi.org/10.1007/s10336-018-1586-4

Evans M NEUR '18 and **Dougherty K**. 2018. Carbamazepine-induced suppression of repetitive firing in CA1pyramidal neurons is greater in the dorsal hippocampus than the ventral hippocampus. *Epilepsy Research*. 145:63-75. https://doi.org/10.1016/j.eplepsyres.2018.05.014

Frawley E, Karlinsey J, Singhal A, Libby S, Paschalis-Thomas D, Ischiropoulos H, and Fang F. 2018. Nitric oxide disrupts zinc homeostasis in *Salmonella enterica* Serovar Typhimurium. *mBio***.** 9(4) https://doi.org/10.1128/mbio.01040-18

Kelly P, Gonzalez M, Renwick W, and Vanni M. 2018. Increased light availability and nutrient cycling by fish provide resilience against reversing eutrophication in an agriculturally impacted reservoir. *Limnology and Oceanography*. https://doi.org/10.1002/lno.10966

Laport R and Ng J. 2017. Out of one, many: The biodiversity considerations of polyploidy. *American Journal of Botany*. https://doi.org/10.3732/ajb.1700190

Ng J, Weaver W, and **Laport R**. *In Press*. Testing Darwins' naturalization conundrum using phylogenetic relationships: generalizable patterns across disparate communities. *Diversity and Distributions*.

Gaynor M, Ng J, and **Laport R**. 2018. Phylogenetic structure of plant communities: Are polyploids distantly related to co-occurring diploids? *Frontiers in Ecology and Evolution*. 6:52. https://doi.org/10.3389/fevo.2018.00052

Popescu F '20, Jaslow C, Kutteh W. 2018. Recurrent pregnancy loss evaluation combined with 24-chromosome microarray of miscarriage tissue provides a probable or definite cause of pregnancy loss in over 90% of patients. *Human Reproduction*. 33:579-87. https://doi.org/10.1093/humrep/dey021

Meetings

Betton B BMB '20, **Freyaldenhoven T BMB '20**, **Olsen E BIOM '18**, Hameed Y '21, **Atiq Z BMB '17**, **Singh A '19**, Campbell L CHEM '19, **Parish P '18**, **Hill T**, and Jackson Hayes L. Analyzing protein kinase C domain interactions with the formin SEPA. American Society for Biochemistry and Molecular Biology Meeting, San Diego, CA. (May 2018)

Betton B BMB '20, Hobson J, **Olsen E BIOM '18**, **Hill T**, and Jackson-Hayes L. Analyzing protein kinase C interactions with Rho4 and Bud3 in the filamentous fungus *Aspergillus nidulans*. American Society for Biochemistry and Molecular Biology Meeting, San Diego, CA. (May 2018)

de la Sancha N and **Boyle S**. Graph theory analysis in highly fragmented Atlantic forest remnants of eastern Paraguay. US-International Association of Landscape Ecology Conference, Chicago, IL. (April 2018)

Christman B BIOM/ENVS '21, Donahue E '22, Boves T, Bryant L, **Dorn P BIOM '20**, **Levesque C '19** , **O'Reilly A '18**, **Popescu M '20**, Raibley R, Wessels J, Worm A, Youtz J, and **Collins M**. Habitat use by Loggerhead Shrikes (*Lanius ludovicianus*) in the Lower Mississippi Alluvial Valley. International Ornithological Congress. Vancouver, Canada (August 2018)

Donahue E, **Collins M**, Bryant L, Worm A, **Matthews A ENVS '14**, Wessels J, Youtz J, Raibley R, and Boves T. Non-breeding ecology of a declining grassland bird in agricultural landscapes: the loggerhead shrike. American Ornithological Society. Tucson, AZ (April 2018)

Donahue E, **Collins M**, Bryant L, Worm A, **Matthews A ENVS '14**, Wessels J, Youtz J, Raibley R, and Boves T. Non-breeding ecology of a declining grassland bird in agricultural landscapes: the loggerhead shrike. Arkansas Chapter of The Wildlife Society. Little Rock, AR (March 2018)

Ugwu U, Jackson-Hayes L, and **Hill T**. Localization of the mutant SEPG1 protein to sites of cell division in the filamentous fungus *Aspergillus nidulans*. American Society for Biochemistry and Molecular Biology Meeting, San Diego, CA. (May 2018)

Gaynor M, Ng J, and **Laport R**. Waves or Ripples? Whole genome duplication and plant community structure. Tennessee Academy of Science annual meeting. Clarksville, TN. (November 2018)

Gaynor M, Ng J, and **Laport R**. Waves or Ripples? Whole genome duplication and plant community structure. Ecological Society of America annual meeting. New Orleans, LA. (August 2018)

Laport R and Ng J. Out of one many: The biodiversity considerations of polyploidy. Botanical Society of America annual meeting. Rochester, MN. (July 2018)

Williamson M BMB '18, **Rowland L BMB '19**, Beckman S URBAN '19, Jackson-Hayes L, **Hill T**. Roles of INN1, CYK3, and PAXB proteins in cytokinesis in the filamentous fungus *Aspergillus nidulans*. American Society for Biochemistry and Molecular Biology Meeting, San Diego, CA. (May 2018)

Curricular Evolution
Biology Course Updates
Spring 2019 and Beyond

Two New Course Offerings:

NEW! BIOL 322 Plant Diversity & Evolution
After a two year hiatus, the Biology Department is offering a plant course again! Plants have evolved a stunning diversity of forms and reproductive strategies. They occupy some incredibly challenging ecological niches, and form the basis of food chains and human economic systems. This new course, offered by Dr. Laport, will survey the defining features of some major plant groups emphasizing morphology, reproduction, ecology, geography, and evolution. This includes examining water relations, photosynthesis, respiration, and plant-soil and plant-animal interactions that determine the relationships between plants and their physical and biological environments. This course will also explore the history of plant use in society, including the evolving relationships between humans and plants as food, medicine, fuel, fibers, and dyes, and plant population changes in response to climate change. Laboratories will involve original research design, data analysis, discussion of literature, presentation of ideas in a variety of formats, and field-oriented components stressing plant identification and ecology. Class meets MWF 9:00-9:50 with lab Th 12:30-3:30. Biology and ENVS majors are encouraged to enroll!

NEW! BIOL 318 Entomology
For the first time ever, we are offering a course in Entomology! Taught by Dr. Haddad, Entomology will include a survey of insect orders and will introduce students to their structure, diversity, evolution, and ecology. Insects constitute a remarkably diverse and successful lineage of animals that has persisted on Earth for hundreds of millions of years. Our evolution and survival are truly interwoven with theirs since they directly affect our health, food security, and economy. Their ecologies are fascinating, they provide us with absolutely essential ecosystem services, and they make incredibly useful models for understanding various biological processes. Labs will focus on insect collection and identification, with the end-goal of building an insect collection by the end of the course. As such, students will spend considerable time in the field observing and collecting insects. Occasional weekend field trips are required. Class meets MWF 10:00-10:50 with lab M 1:00-4:00, and its prerequisites are BIOL 130/131 and 140/141 or BIOL 120 and CHEM 120/125.

Rocky Mountain Ecology Field Research Maymester

Are you interested in studying and gaining ecological field experience in Grand Teton and Yellowstone National Parks? If so, check out the Rocky Mountain Ecology Field Research Maymester (ENVS 170; F7 and F11). This year the course will be held from May 26 – June 20. The course is appropriate for science and non-science majors. Applications (and financial aid) are considered on a rolling basis, so apply early! Applications are available through the Buckman Center's site: https://internationalprograms.rhodes.edu/index.cfm?FuseAction=Programs.ViewProgram&Program_ID=26767. Please contact Dr. Collins if you are interested in this opportunity.

Semester in Environmental Sciences at Marine Biological Laboratory

The Marine Biological Laboratory at Woods Hole offers a Semester in Environmental Sciences Program every Fall. This 16-credit program is geared towards Biology, Chemistry, and Environmental Science majors interested in ecosystem science and biogeochemistry. Students take courses such as Aquatic and Terrestrial Ecosystem Analyses, Microbial Ecology, and Independent Research, and get to know many of the staff and visiting scientists at Woods Hole. Students who are interested in learning more about the program should contact Dr. Boyle. The SES deadline is March 20 for the Fall 2019 semester. There is an $18,000 scholarship available for one Rhodes student to participate in the program

Maymester Course: BIOL 214 Environmental Field Study in Namibia is scheduled for 2019. If a minimum of students enroll, the Maymester will be offered May 9 – May 30. The course visits the Namib Desert, dry thornveld savannas, and the Kalahari sands, along with meeting indigenous people, NGOs, and governmental officers involved in local environmental issues. This 4-credit Maymester to Namibia (BIOL 214) may be combined with the 4-credit course at Rhodes (BIOL 212) to fulfill one upper-level Biology course with lab, an Environmental Science elective, and the F11 requirement. Interested students should contact Dr. Collins and plan to attend an informational session on Wednesday, October 24th, from 11:30–1:30 in FJ-100.

Senior Seminar News

One Biology senior seminar this spring is BIOL 486-01: Tropical Ecology, MWF 11:00-11:50 AM, taught by Dr. Pike. The second seminar, BIOL 486-02 will still be offered TR 4:00-5:15 PM for the students who signed up last year. However, Dr. Honsa will not be here in the spring, so the topic will likely change depending on who is hired to teach the class.

Juniors note that senior seminars for the '19-'20 academic year will be listed in the spring issue of BIOFEEDBACK, along with information about the lottery for enrollment.

Mugs for Majors!

The Pentaceratops dinosaur that occupied the FJ Lobby for 20 years was removed during renovations in 2013. We now have a mural and fond memories of its time in FJ, plus we also have Biology Dinosaur coffee mugs for majors! When you complete your declaration of a Biology major, stop by the Biology office in its new location (FJ 132, by the Robertson Hall connector) and ask Ms. Dianne Cox for your mug. You can also pick one up if you declared before this year and never got one. Cheers!

FRAZIER JELKE SCIENCE CENTER

Optimal Foraging

The following courses will be offered next semester

SPRING SCHEDULING SHUFFLE

Dr. Honsa has accepted a position teaching medical microbiology at the ATSU School of Osteopathic Medicine in Arizona. Her new job starts in January, so we are looking for someone to cover her courses this spring. Dr. Honsa was originally scheduled to teach Microbiology lecture and lab and a senior seminar. The senior seminar will still be offered on TR 4:00-5:15 as planned, although the topic will likely change. We intend to offer Microbiology, but will need to confirm the appropriate days and times once we hire someone to teach it.

Number	Course Title	Hours Offered
140	Biology II (4 sections)	MWF 8:00-8:50, 9:00-9:50, 10:00-10:50 TuTh 8:00-9:15
141	Biology II Lab (7 sections)	T 12:30-3:29, 4:00-7:00 W 1:00-4:00 Th 12:30-3:30
204	Mech of Development (Fitz Gerald)	MWF 8:00-8:50 W Lab 1:00-4:00
209	Embryology (CJaslow)	TuTh 8:00-9:15
301	Microbiology (TBA)	TBA
304	Genetics (Miller)	TuTh 9:30-10:45 T Lab 12:30-3:30
318	Entomology (Haddad)	MWF 10:00-10:50 M Lab 1:00-4:00
320	Conservation Biology (Kelly)	TuTh 9:30-10:45 W Lab 1:00-4:00
322	Plant Diversity & Evolution (Laport)	MWF 9:00-9:50 Th Lab 12:30-3:30
325	Molecular Biology (Wheeler)	MWF 8:00-8:50 Th Lab 12:30-3:30
340	Animal Physiology (Kabelik)	TuTh 9:30-10:45 M Lab 1:00-5:00
376	Molec & Cell Neuroscience (Dougherty)	TuTh 11:00-12:15 M Lab 1:00-4:00
380	Topics in Biomedical Science (Miller)	TuTh 8:00-9:15
CHEM 414†	Biochemistry (Loprete) (Stoddard)	MWF 11:00-11:50 TuTh 9:30-10:45
NEUR 270†	Neuroscience (TBA)	

Senior Seminar Sections

486-01	Tropical Ecology (Pike)	MWF 11:00-11:50
486-02	(Topic and Instructor TBA)	TuTh 4:00-5:15

† *No more than two courses taken outside the Biology Department may count for the six upper-level courses required for the Biology Major*

The Hybridization Zone

Neuroscience Program Announcements

First, let's welcome Dr. Dan Blustein to the Neuroscience Program! Dr. Blustein started teaching his Movement Neuroscience depth course with lab this fall. Dr. Kabelik is likewise offering his Neuroendocrinology class with a new lab component this fall. In spring, Dr. Dougherty will be teaching Molecular and Cellular Neuroscience with lab, and Dr. Haberman will teach Cognitive Neuroscience with lab. These four courses make up the new set of Depth Courses within the Neuroscience major.

You may also notice in the new Neuroscience Major posters that we have now split our Breadth course category in two. The new Breadth category comprises solely of courses with extensive Neuroscience content. We plan to offer a new course within this category, Clinical Neuroscience (taught by Dr. Klatzkin), starting within the 2019-2020 year. We hope to also add Computational Neuroscience in the near future. The remaining courses no longer listed as Breadth courses now fall into the category of Electives.

With the restructuring of courses and course categories, there are some slight changes to requirements for a Neuroscience major. Please note that these new requirements apply only to students that joined the college starting in 2018-2019. Students that joined prior to this year are able to choose either the old or new requirements.

Finally, Neuroscience is excited to announce that we have been awarded a Hearst post-doctoral fellowship line. This funding will be used to recruit a Neuroscientist from historically underrepresented minority groups in higher education. Our hope is that this could eventually lead to a permanent faculty position and help to increase areas of research and pedagogical expertise, as well as faculty diversity, within our program. We hope that you will volunteer to participate in some of the events associated with this search process.

If you have further questions about the Neuroscience Program, then please contact Dr. David Kabelik at kabelikd@rhodes.edu.

Environmental Studies and Science Program Announcements

The Environmental Studies and Sciences (ENVS) Program is excited to welcome our new Biology faculty with environmental interests. Prof. Kelly will offer Conservation Biology and Prof. Laport will offer Plant Diversity and Evolution in the spring, and both courses will count as electives for ENVS majors and minors. Other science course offerings that count for ENVS include Entomology, Environmental Chemistry, Microbiology, Organic Chemistry, and Physical Geology. There will be a section of ENVS 150 Environment and Society, one of the required courses for all ENVS majors and minors. We plan to offer ENVS 150 in Fall 2019, too. Students with environmental interests should contact Prof. Boyle, especially if students have questions about course planning for the Spring 2019 semester. It's also never too early to think about applying for the Rosanna Cappellato Award in Environmental Sciences (which is open to any science major, not just environmental science majors; deadline is March 31) or the Steve and Riea Lainoff Crop Trust Fellowship in honor of Cary Fowler (open to a graduating senior to work at The Crop Trust in Bonn, Germany for 12 months; deadline is January 31).

Biochemistry and Molecular Biology Program

BMB Seminar
November 28, 2018
Kristen Wendt '14
Ph.D. candidate
Molecular Genetics and Genomics Program
Washington University
Further details concerning her visit are forthcoming.

The BMB Program is proud to report that 83% of 2018 Rhodes BMB graduates passed the ASBMB accreditation exam and earned accredited degrees! This is an outstanding performance compared to the 42% national pass rate. Hats off to the BMB class of 2018 and to all of the BMB program professors!

DEPARTMENTAL MIGRATIONS

Patrick Kelly: Dr. Patrick Kelly joins the Biology Department as an Assistant Professor, currently instructing BIO 120 Introduction to Environmental Science and looking forward to teaching a course in Conservation Biology in the Spring. Dr. Kelly is new to the south, having spent his entire life migrating his way around the Midwest. After finishing a B.S. in Biology with an Environmental Science concentration from the University of Wisconsin – La Crosse, he decided he wanted a career in research after a great experience during an internship at the U.S. Geological Survey monitoring river metabolism in the Mississippi River. Dr. Kelly stayed in La Crosse for an M.S. in Aquatic Science, then moved to the University of Notre Dame for his Ph.D. His last stop before Rhodes was a postdoctoral fellow position at Miami University in Oxford, OH. Along these stops, Dr. Kelly has been fortunate to be involved in research in all sorts of aquatic ecosystems, with research projects on the Mississippi River, small North Temperate lakes in the Upper Peninsula of Michigan, and a reservoir in rural Ohio. He has also studied all aspects of the food web, from tiny phytoplankton to largemouth bass. Dr. Kelly is excited to start a new research program at Rhodes focused on observing how carbon and nutrients cycle and move through local streams, lakes, and reservoirs. He is also looking forward to the small class sizes of a liberal arts environment and the ability to involve undergraduates in research.

Robert Laport: Dr. Robert Laport is joining the Biology Department as an Assistant Professor with interests in Evolutionary Biology and Botany. He is currently teaching Evolution (BIOL 200) and looks forward to teaching Plant Diversity & Evolution (BIOL 322) in the Spring of 2019.

Dr. Laport completed his B.S. in Biology at Oregon State University, followed by a M.Sc. and Ph.D. in Ecology and Evolutionary Biology at the University of Rochester, where he began studying the influence of whole genome duplication (polyploidy) on plant population genetics and evolution. He moved on to post-doctoral fellowships at the University of Nebraska-Lincoln and the University of Colorado-Boulder where he continued to study the ecological consequences of polyploidy, while also teaching courses in Evolution, Speciation, and Ecological Niche Modeling. In his primary study system, the desert creosote bush (*Larrea tridentata*), Dr. Laport investigates whether having different numbers of chromosomes can contribute to unique adaptations that facilitate living in different habitats, and ultimately, how genome duplication can contribute to speciation and patterns of biodiversity. In addition to his work on desert plants, Dr. Laport also has an affinity for forest ecosystems – likely a product of living amidst conifer forests in western Oregon and hardwood forests in upstate New York. Dr. Laport has mentored forest ecology and genetics research with undergraduates and is eager to translate these research experiences to forest habitats of western Tennessee. The Overton Park Old Growth Forest, just across the street from Rhodes College, represents a unique opportunity to learn plant ecology field techniques in a living laboratory. Research within the Overton Old Forest, as well as nearby forest habitats, might even lead to the discovery of some now-rare American Chestnut trees. This species, once one of the most common forest trees of eastern North America, was nearly extirpated in the 1900s by an introduced fungal pathogen. Multifaceted restoration efforts are underway, but more remnant individuals need to be identified as sources of genetic variation and local adaptation. If you are interested in research with Dr. Laport, see "Signals and Displays" (page 6) for more information.

Signals & Displays
Short Communications

Tri-Beta News

Beta Beta Beta (βββ) is a national biological honor society with an active chapter at Rhodes. βββ is dedicated to the enrichment of its members' scientific experiences and to the distribution of knowledge gleaned from those experiences. Current chapter activities include participation in the Rhodes Journal of Biological Science, coordination of student research presentations, organization of various fundraising events, and hosting of biological seminars. βββ provides a forum to recognize those students, with a biological science as their undergraduate major, who excel academically. May it be noted that Rhodes has an array of biological science disciplines, meaning there are βββ members who are not only passionate Biology majors, but also Neuroscience, Environmental Science, and Biochemistry and Molecular Biology majors. Regular membership can only be attained through invitation but any student meeting the criteria who is interested in becoming an associate member for the next school year should contact the current president, Lauren Hamm hamln-19@rhodes.edu or vice president, Teia Popsecu popfi-19@rhodes.edu.

Tri-Beta has some exciting service projects planned for the fall and spring semesters. One ongoing project entails hosting monthly meetings with the Springdale Elementary School's Science Club. We will also be volunteering at Springdale Science Saturday events. Finally, we will be inducting new members toward the end of this fall semester. We are excited to welcome new individuals into the society and congratulate them on their commitment to biological excellence.

Get Your Research in Print

After hours of hard work in the lab or field, why not publish your research in the *Rhodes Journal of Biological Science*? We encourage you to submit papers from your summer research or research conducted during the school year, as well as commentaries and reviews of biological topics. You do not need to complete research research specifically in biology, so please ask if you can publish with us!

Also, if you haven't written a paper recently, think about helping out with the journal, editors are always welcome! Please contact Allison Young youat-19@rhodes.edu if you are interested in submitting a paper or working with the journal. The deadline for paper submissions will be at the start of Spring semester, so start thinking about your submission now!

$$ Biology Research Award$$

This spring, the Biology Department will be presenting the "Award for Outstanding Student Research in Biology." Any Biology Major who has completed research at Rhodes or elsewhere is eligible for this award. The winner will receive a cash prize, be honored at the award convocation ceremony, and have their name engraved on the Biology Research Award plaque that is displayed outside of the Biology office. To be considered, a student must submit a three to five page research paper, plus a recommendation from the research supervisor, to Dr. Dougherty, doughertyk@rhodes.edu by Friday, March 29th, 2019. Announcement of the award winner will be made at spring awards convocation ceremony.

Greenhouse and Plant Research

You have probably seen the new FJ temporary greenhouse in the rose garden courtyard. Wondering what's going on in there? Interested in plant ecology and evolution research?

Dr. Laport moved over one hundred study plants into the temporary greenhouse and is getting them acclimated to living in Memphis. These plants, creosotebush or *Larrea tridentata*, are long-lived perennials (on the order of hundreds to thousands of years!) from the deserts of the southwestern US and northern Mexico. Plants from the Chihuahuan, Sonoran, and Mojave Deserts differ in ploidy—the number of complete copies of the genome—which contributes to differences in physiological processes and ecological adaptation, as well as pollinator visitation and speciation. If you are interested in plant evolutionary ecology research and want to learn more, talk to Dr. Laport about opportunities to conduct research in the lab and greenhouse, or even opportunities to conduct forest ecology research in Overton Park and surrounding natural areas!

Student Presentations | April 2018
Rhodes Undergraduate Research and Creative Activity Symposium
(Rhodes faculty supervisors listed)

Ahmad Z BIOM '18. A quantitative characterization of amino acid and fatty acid metabolism in cancer cells (Dr. Erin Bodine)

Alapati A NEUR '19. A medium throughput compound screen for approved drugs that suppress seizures in Dup15q syndrome (Jungsoo Han, Tracy Peters, Glen Palmer, and Lawrence Reiter UTHSC) (Dr. David Kabelik)

Alwis Y NEUR '19 and Haberman J. Emotional judgments of individual scenes are influenced by unintentional averaging (Dr. Jason Haberman)

Aramandla M '19 and Palopoli M. New therapeutic tools for IMN: Design of antigen specific binding proteins targeting the THSD7A antigen (Dr. Shana Stoddard)

Bartlett A NEUR '18. DNA methylation and health outcome in an aging cohort (Khyobeni Mozhui UTHSC (Dr. Charles Snyder)

Basset R '18. Constituents of *Brunfelsia grandiflora* against pediatric malignancies (Fatima Rivas St. Jude Children's Research Hospital) (Dr. Mauricio Cafiero)

Beckman S, **Rowland L BMB '19**, Brookover Z, Ward R, and Jackson-Hayes L. Identification of chitin synthases required for cytokinesis in the filamentous fungus *Aspergillus nidulans* (Dr. Terry Hill)

Benfield L and **Holton M '20**. Determining DNA sequences responsible for heterochromatin formation in *S. pombe* (Dr. Bayly Wheeler)

Betton B BMB '20, Hobson J, and **Olsen E BIOM '18**. Analyzing protein kinase C interactions with Rho4 and Bud3 in the filamentous fungus *Aspergillus nidulans* (Dr. Loretta Jackson-Hayes)

Brode K MUS/ENVS '18. STAR Communities (Dr. Michael Collins)

Cardona L NEUR '18, **Dave P NEUR '19**, and **Popescu F BIOL/NEUR '20**. Vasopressin receptor expression in *Anolis carolinesis* relative to season (breeding vs. non-breeding) and sex (male vs. female) (Dr. David Kabelik)

Christman B BIOM/ENVS '21, **O'Reilly A '18**, **Dorn P BIOM '20**, **Levesque C '19**, and **Popescu M '20**. Habitat use by Loggerhead Shrikes (*Lanius ludovicianus*) in the Lower Mississippi Alluvial Valley (Dr. Michael Collins)

Connor A NEUR '20. Deaf Space: Architectural design for deaf students (Dr. Lori Garner)

DaRosa A NEUR '18, **Evans M NEUR '18**, **Gaudio E NEUR '1**9, **Mysiewicz S NEUR '19**, **Renna C NEUR '20**, **Shamambo L NEUR '20**, **Siddiq B NEUR '20**, **Velrajan S '20**, **Van Vliet T NEUR '20**, and **Yu M NEUR '20**. Characterization of temporal and longitudinal development in the hippocampus (Dr. Kelly Dougherty)

Dave P NEUR '19. The preventable shunt revision rate: A multicenter evaluation (Garret T. Venable, UTHSC) (Dr. David Kabelik)

Dillas T '18 and **Lindquester G**. Sequence variability in UL39 and UL53 genes of Herpes simplex virus 1 may contribute to neurovirulence (Dr. Gary Lindquester)

Elliott H ENVS '18 and Russ J. Analysis of smoke plants using gas chromatography-mass spectrometry in archaeological residue analysis (Dr. Jon Russ)

Gaudio E NEUR '19. Dosing of perampanel in children: Correlation with serum levels (James Wheless, UTHC, LeBonheur Children's Hospital)

Giampapa R BMB '19, Perchik M, Peterson L, and Cafiero M. The effect of mutations on the binding of ligands in phenylalanine hydroxylase (Dr. Mauricio Cafiero)

Goldman L NEUR '20 and **Stocks O '20**. Epitope characterization and design of epitope binding proteins for idiopathic membranous nephropathy: new tools for autoimmune kidney disease (Dr. Shana Stoddard)

Hameed Y, **Betton B BMB '20**, Campbell L, **Freyaldenhoven W BMB '20**, Olsen E, **Singh A '19**, and Sriram P. Analyzing protein kinase C domain interactions with the formin SepA (Dr. Loretta Jackson-Hayes)

Harrison E, **Ritter A BMB '19**, Peterson L, and Cafiero M. DFT Study of the selectivity of DOPA-decarboxylase (Dr. Mauricio Cafiero)

Healey D BMB '20. The effects of mitochondrial mutation of tumorigenesis (Xiujie L Harms, St. Jude Children's Research Hospital) (Dr. Will Eckenhoff)

Arnold N, **Hedlund A BIOL/ENVS '19**, Imperial K. Moving towards MLK's dreams for equality: The promise of educational technologies (Dr. Marsha Walton)

Hocut J NEUR '18. Emotional valence and point value influence memory in young and older adults (Dr. Geoffrey Maddox)

Hope H ENVS/ECON '18. A hedonic study of Overton Park (Dr. Erin Kaplan)

Joshi A '19 and Wheeler B. Defining the functional bases within centromeric promoters (Dr. Bayly Wheeler)

Joshi A '19. The wind beneath my chicken wing: An ethnographic study of Bosses (Dr. Susan Kus)

Jubrial-Jaber L '19. Reminding and cognitive control in older and younger adults (Dr. Geoffrey Maddox)

Laird W '19, **Le P BMB '15**, and Fitz Gerald J. Characterizing the genetic interaction of AtFH5 and ROP2 in seed size and pollen tube growth (Dr. Jonathan Fitz Gerald)

Lelovic N BMB '20, Hou N, Chuang C, Ustick J, Muesse D, and Russ J. Analysis of nicotine in clay samples by solvent extraction and gas chromatography mass spectrometry (Dr. Dhammika Muesse)

Loome J BMB '18. Ybx1 interacts with the PRC2 complex in early neural development (Jamy Peng, St. Jude Children's Research Hospital)

Mabante M '19 and Fitz Gerald J. The *Arabidopsis* chromatin remodeling ATPase, CHR23, demonstrates a novel parental effect on seed size (Dr. Jonathan Fitz Gerald)

Magee C, **Selner E '18**, Peterson L, and Cafiero M. Design of novel inhibitors for the aldehyde dehydrogenases (Dr. Mauricio Cafiero)

McDonagh D NEUR '19 and Haberman J. Conceptual size ensembles cannot be predicted by individual item size representations (Dr. Jason Haberman)

Middleton C BIOM '18, **Deery E BIOM '18**, Andersen J, Kesselring C, **Olsen E BIOM '18,** and Bodine E. Using agent-based modeling to understand transmission dynamics & initial conditions of the 1878 Memphis Yellow Fever Epidemic (Dr. Erin Bodine)

Middleton C BIOM '18, Kesselring C, Bodine E. Geographic distribution of yellow fever deaths during the 1878 epidemic in Memphis, TN (Dr. Erin Bodine)

Milburn L BMB '19 and **Loome J BMB '19**. YBX1 regulates cell proliferation in developing neural tubes (Myron Evans and Jamy Peng St. Jude Children's Research Hospital)

Morris S BMB '18 and Lindquester G. Quantification of viral and host cytokine IL-10 expression in a mouse model of Epstein-Barr virus infection (Dr. Gary Lindquester)

Morris S BMB '18 Finding fact in fiction: Subjective truth and collective memory in El Espíritu de la Colmena and El Señor Presidente (Dr. Clara Pascual-Argente)

Mullasserril A BMB '19. Targeting histone demethylase KDM6B for treatment of neuroblastoma (Tara Rakiewicz Drexel University and Jun Yang St. Jude Children's Research Hospital) (Dr. Kimberly Brien)

Musicante M '19 and Wheeler B. Characterizing the strength of individual centromeric promoters and their effect on heterochromatin establishment (Dr. Bayly Wheeler)

Myers M BIOM '18. Gaining insight into the efficacy of CD8+ T cell responses in resolving influenza virus infection through mathematical modeling (Amber Smith, UTHSC and Veronika Bernhauerová, Institut Pasteur) (Dr. Erin Bodine)

Myers R '18, **Porter H NEUR '18**, Maddox G and White K. Do phonologically-related intervening names influence spaced retrieval of proper names? (Dr. Katherine White)

Pajarillo A, Roldan R, Embry C, Malkowski S, **Lamanilao G BMB '16**, Cafiero M, and Peterson L. Preventing outer membrane formation in gram-negative bacteria: Design and synthesis of potential LpxC inhibitors (Dr. Larryn Peterson)

Parkinson Z, Horiuchi S, **Hayes C BMB '19**, Welsh C, Stoddard S, and Salud Bea R. Synthesis of peptides of the CTLD1 domain on the PLA2R antigen in idiopathic membranous nephritis to determine epitope sites locations (Dr. Kimberly Brien)

Perchik M, **Giampapa R BMB '19**, Peterson L, and Cafiero M. DFT Analysis of the selectivity of phenylalanine hydroxylase (Dr. Mauricio Cafiero)

Popescu F BIOL/NEUR '20. Relationship between long acting reversible contraceptive use in adolescent females and sexually transmitted disease (Karen J. Derefinko UTHSC) (Dr. Charles Snyder)

Rasasack I BMB '20 and Stoddard S. In silico characterization of the β2-glycoprotein I epitope domains for the treatment of systemic lupus erythematosus (Dr. Shana Stoddard)

Redding A ENVS '18. Environmental threats facing Lake Baikal (Dr. Peter Hossler)

Rich B, **Goldman E NEUR '18**, Martin C and Stoddard S. Synthesis and computational evaluation of vorinostat boron derivatives as potential histone deacetylase inhibitors (Dr. Kim Brien)

Roark E NEUR '19. Characteristics of patients referred to Headache Clinic at Le Bonheur Children's Hospital (Lara Koral, Tonya Polk and Christy Zarski, Le Bonheur Children's Hosptial) (Dr. David Kabelik)

Rowland L BMB '19, **Williamson M BMB '18**, and Jackson-Hayes L. Co-immunoprecipitation using BimG::GFP in the filamentous fungus *Aspergillus nidulans* (Dr. Terry Hill)

Ryan K NEUR '19. Pervasive motor deficits beyond lesioned hemisphere in pediatric arterial ischemic stroke (Roozbeh Rezaie, Asim F. Choudri, Christen M. Holder, Tracy J. Tidwell, Paras M. Bhattarai, Shalini Narayana, and Nicole L. Shay LeBonheur Children's Hospital, Felipe Salinas University of Texas) (Dr. Jason Haberman)

Shamambo L NEUR '20. Granule neuron differentiation status and substrate modulate the Netrin-1 signaling response in the cerebellum (Christophe Laumonnerie and David J. Solecki St. Jude Children's Research Hospital) (Dr. Kelly Dougherty)

Smith P BMB '18, Ellingwood A '19, Almalem Y '20, and Wheeler B. Understanding RevCen mediated heterochromatin establishment in *S. pombe* (Dr. Bayly Wheeler)

Sommerkamp E '19, Burlison J and Hoffman J. Implementing standardized patient handoff procedures for interdepartmental transports between inpatient and OR (Dr. Alan Jaslow)

Stocks O '20 and **Goldman L NEUR '20**. Design of epitope binding monobodies as a potential therapeutic tool for autoimmune kidney disease (Dr. Shana Stoddard)

Stover J BMB '20. Identifying Ubr4 substrates and regulators of muscle growth (Liam Hunt St. Jude Children's Research Hospital) (Dr. Bayly Wheeler)

Suresh S NEUR '18 and Haberman J. Conceptual size ensembles cannot be predicted by individual item size representations (Dr. Jason Haberman)

Thomasson S NEUR '18 and Haberman J. No change in perceived hand size after Rubber Hand Illusion induction (Dr. Jason Haberman)

Trenner S BMB '19, Fowler T, Eckenhoff W and Graves A. Further synthesis toward a polydentate ligand for future catalytic hydrogen production (Dr. Dana Horgen)

Welsh C, **Hayes C BMB '19**, **May X '19**, and Stoddard S. Do single nucleotide polymorphisms create immunogenic sites? Tools for the design of epitope binding monobodies for autoimmune kidney disease therapies (Dr. Shana Stoddard)

Williams G BIOL/ENVS '18, **Long M ENVS '19**, **Wilson M ENVS' 17** and Massad T. Treefall gap dynamics in an urban old growth forest (Dr. David Pike)

Williamson M BMB '18 and Jackson-Hayes L. Elucidating the role of paxillin B in septation in *Aspergillus nidulans* (Dr. Terry Hill)

Wittwer E '20 and Horgen D. Diels-Alder reaction to synthesize biologically active molecules (Dr. Dana Horgen)

Woody A, **Jelinek S NEUR '18**, Peterson L, and Cafiero M. DFT study of the selectivity of monoamine oxidase B (MAOB) (Dr. Mauricio Cafiero)

Yousuf S BMB '19 and Frawley E. Manganese acquisition is important for the resistance of *Salmonella* Typhimurium to nitrostative stress (Dr. Elaine Frawley)

Yousuf S BMB '19 Islam's impact on African American music (Dr. Vanessa Rogers)

Zaravar A '19, **May X '19**, and Stoddard S. New tools for autoimmune kidney disease: Rational design of antigen binding monobodies (Dr. Shana Stoddard)

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