

BIOFEEDBACK

THE NEWSLETTER OF THE BIOLOGY DEPARTMENT AT RHODES

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The Chair's Niche



For the last three years, Sarah Morris, BMB '18, has been a regular contributor to Biofeedback each semester. From interviews of new faculty, to notices about animals or the new building, Sarah's creativity and her enthusiasm for nature and science have brought enjoyable articles from a student's perspective to our newsletter. For her farewell article,

Sarah asked other seniors to comment on their experiences in Biology and our interdisciplinary partners (see page 5). As Sarah graduates this spring and leaves Rhodes, I want to thank her for her thoughtful contributions to Biofeedback and wish her well in her future endeavors. Perhaps that will include a contribution from an alumni perspective! If there are any other aspiring journalists who would like to step up next year and write for Biofeedback, please let me know.

Dr. Carolyn Jaslow, Chair



Primary Productivity & Secondary Growth

Honors | Awards | Grants | Publications | Meeting Participation

HONORS AND AWARDS

Congratulations to:

Casey Middleton BIOM '18 and **Erin Deery BIOM '18** won awards at the Symposium on Biomathematics and Ecology Education and Research Conference held at Illinois State University.

Tieren Burrow ENVS '19 has won the annual scholarship presented by the Memphis Area Geographic Information Council (MAGIC).

Ellie Fratt NEUR '18 was an invited speaker at Breaking Barriers: Supporting Women in STEM held November 15, 2017 in Washington, DC. As a former recipient of the foundation's STEM scholarship, Fratt had the honor of introducing the keynote speaker.

Publications

Barnett A, de Oliveira T, da Silva R, Teixeira S, Todd L, and **Boyle S** 2018. Honest error, precaution or alertness advertisement? Reactions to vertebrate pseudopredators in red-nosed cuxiús (*Chiropotes albinasus*), a high-canopy neotropical primate. *Ethology* 124:177-187. DOI: 10.1111/eth.12721.

Boyle S 2017. Deforestation. In *The International Encyclopedia of Primatology*. Fuentes, A. (ed.), John Wiley & Sons. DOI: 10.1002/9781119179313.wbprim0138.

de la Sancha N, **Boyle S**, and Patterson B 2017. Getting back to the basics: museum collections and satellite imagery are critical to analyzing species diversity. *BioScience* 67: 405-406.

Barnett A., Silla J, de Oliveira T, **Boyle S**, Bezerra B, Spironello W, Setz E, Soares da Silva R, de Albuquerque Teixeira S, and Pinto L 2017. Run, hide or fight: anti-predation strategies in Endangered red-nosed cuxiú (*Chiropotes albinasus*, Pitheciidae) in southeastern Amazonia. *Primates* 58: 353-360.

Burman E '18, Ackerman J, Tremblay R. 2017. Invasive *Syzygium jambos* trees in Puerto Rico: no refuge from guava rust. *Journal of Tropical Ecology* 33:205-2012.

Hannah J, Garcia M, Lardennois A, **Leavey P '17**, Maglic D, Fagnan A, Go J, Roach J, Wang Y, Finkelstein D, and Hatley M. 2018. PAX3-FOXO1 drives miR-486-5p and represses miR-221 contributing to pathogenesis of alveolar rhabdomyosarcoma. *Oncogene* <https://doi.org/10.1038/s41388-017-0081-3>.

Mainwaring M, Barber I, Deeming D, **Pike D**, Roznik E, and Hartley I. 2017. Climate change and nesting behavior in vertebrates: a review of the ecological threats and potential for adaptive responses. *Biological Reviews* 92:1991-2002.

Brejic K, Bian Q, Uzawa S, **Wheeler B**, Anderson E, King D, Kranzusch P, Preston C, Meyer B. 2017. Dynamic control of X chromosome conformation and repression by a histone H4K20 demethylase. *Cell* 171:85-102.e23. <https://doi.org/10.1016/j.cell.2017.07.041>.



Burrow T ENVS '19. Memphis flood mapping and evaluating flood risk areas in Shelby County, TN and proximity to resources. Memphis Area Geographic Information Council, Memphis Agricenter (November 2017).

Collins M, and Boves T. Habitat use by Loggerhead Shrikes (*Lanius ludovicianus*) in the Lower Mississippi Alluvial Valley. Tennessee Bird Conservation Partnership meeting, Nashville, Tennessee (January 2018).

Middleton C BIOM '18 and **Deery E BIOM '18**. The potential impact of using vaccinations and insect repellent to control the spread of yellow fever. Symposium on Biomathematics and Ecology Education and Research Conference, Illinois State University (October 2017).

Selner E '18. "Design of novel inhibitors of the aldehyde dehydrogenases". Posters on the Hill, Washington, DC (April 2017).

Senior Seminar Lottery

Wednesday, March 21 at noon in FJ 183

Next year, the Biology Department will offer three sections of Biology Senior Seminar: one in the fall and two in the spring. Rising seniors, please consult the descriptions of these senior seminar courses below.

All rising Biology seniors must reserve a slot in a fall or spring Biology senior seminar section via a lottery that will be held in the core Bio lab 183 at noon on Wednesday, March 21.

If you cannot attend the lottery, you must send a representative prepared with an ordered list of your choices. Once you have signed up by lottery, you should list your reserved senior seminar section last on the registration tree under the category of "Other Courses" when you register for that particular semester. Biology students will not be allowed to register in a seminar section other than the one which they reserved through the lottery. If you have questions about the lottery, are planning to be abroad for a semester next year, or are planning to graduate in December, contact Dr. C. Jaslow immediately



Fall Senior Seminar

BIOL 485 Insect Ecology and Evolution
MWF 11:00-11:50

Dr. Stephanie Haddad

Insects are the epitome of biodiversity, with millions of extant species that comprise the most fascinating lineages ever to have evolved in the history of life on Earth. They are absolutely vital to our existence, affecting everything from our health to our economy, and yet their extraordinary biology remains foreign to so many of us. In this senior seminar series, we will explore various aspects of insect ecology and evolution, delve into the biochemical and molecular mechanisms behind insect adaptations, and discuss how insects are used in medical, agricultural, and industrial biotechnology. We will critically review published scientific papers and prepare presentations and reports on topics of interest to the class, which will ultimately shed light on why Darwin wrote, "I am dy-

ing by inches, from not having any body to talk to about insects...".

Spring Senior Seminars

BIOL 486-01 Tropical Ecology.

MWF 11-12

Dr. David Pike

Tropical regions are important centers of biological diversity worldwide that provide us with important resources (food, tea, coffee, spices, and medicine) and exceptional ecotourism opportunities. We will explore the ecology of tropical habitats to understand why the tropics are so biologically diverse, how and why natural habitats are being altered at alarming rates, and what we can do to protect and restore remaining habitats, species, and undiscovered resources. We will do this through background readings, student presentations, and written reports that cover topics of student interest, ranging from organismal biology and community ecology through to diseases and health issues facing humans, plants, and animals.

BIOL 486-02 Mechanisms of Antibiotic Resistance and New Antimicrobial Approaches.

TR 4:00-5:15

Dr. Erin Honsa

The discovery of antibiotics may be one of the greatest achievements in medicine. Antibiotic treatments have improved clinical outcomes from infection, leading to the reduction of morbidity and mortality from infectious diseases. However, the overuse and abuse of antibiotics as lead to the rise of antibiotic resistant pathogens, which is now a worldwide concern. This senior seminar series will focus on the molecular mechanisms that bacterial pathogens utilize to become resistant to antibiotic therapy, as well as a broader focus on human-bacterial interactions during these resistant infections. As a class, you will undertake the sharing, learning, questioning, and communicating of ways in which scientists discover how bacteria become antibiotic resistant, how to treat these infections, and current research on the development of novel anti-infective treatments.

Curricular Evolution

Biology Course Updates

for 2018 -2019

New Courses, More Sections, & Course Inversions

What to expect this year

Drs. Lindquister and Hill were both granted sabbatical leaves in 2018-19. Dr. Hill's leave is scheduled in the spring semester, so he will be teaching Cell and BMB 310 in the fall as usual, but Mycology will not be offered in the spring. Dr. Lindquister has a full year's leave so Virology/Immunology will not be offered at all in 2018-19. In addition, Dr. Jackson-Hayes in the Chemistry Department will be on sabbatical in the spring, so her CHEM 416 Mechanisms of Drug Action will only be offered in the fall. Although we will miss these course offerings, you can look forward to some new and returning courses. Environmental Issues in Southern Africa will be offered in the fall. It counts as an upper-level Biology course without lab, but students who take it and also go on the Maymester field trip to Namibia can combine both courses to fulfill an upper-level Biology course with lab (see details below). This year, Evolution with lab was sorely missed from our curriculum, but it will be back in the fall, taught by new faculty member, Dr. Robert Laport. Dr. Laport will then offer a new plant biology class with lab in the spring. All this is very exciting, but what good are flowers without bees? Next spring will also feature a new Entomology class with lab, to be offered by Dr. Haddad. Details of these courses for spring 2019 will be available in the fall issue of Biofeedback.

GIS (INTD 225) will only be offered next year for one section in the fall semester.

BIOL 375 Neuroendocrinology and **BIOL 376 Molecular and Cellular Neuroscience** will now be taught with accompanying co-requisite lab sections.

Updates in Math/CS cognates for Biology majors

Biology majors have to fulfill two cognates in mathematics and/or computer science. As the Math/CS department has changed their offerings, we have adapted our requirements accordingly and introduced some new options for majors. The two

Math/CS cognates for Biology majors are as follows:

Computational requirement: Study in the field of biology frequently requires a computational approach to understand the natural world. This may involve tools ranging from basic arithmetic calculations to the use of complex equations and models to describe processes that occur in living systems. Students who seek to major in Biology are required to gain computational experience by taking one of the following cognate courses: COMP 141 or above, MATH 115, MATH 122, MATH 214, or INTD 225 (Geographic Information Systems [GIS]). Students who took MATH 121 prior to the 2018-2019 academic year may still count it.

Statistical requirement: Statistics is an important tool for the study of biology as it encompasses the process of collecting, analyzing, and interpreting data, and making inferences about larger populations from sample measurements. Students who seek to major in Biology are required to gain experience using statistics by taking one of the following cognate courses: MATH 211, PSYC 211, or ECON 290. MATH 111 currently may be used to fulfill this requirement, but this option is under review and may be removed from the list. If that happens, students who completed MATH 111 prior to the change in requirements would still be able to count it.



BIOL 350 Comparative Vertebrate Morphology/Anatomy

CVM will again be offered with two 9 AM lectures most weeks and two (unequal) formal lab meetings a week. One lab meets

Tuesday from 12:30-3:30. The second lab each week meets Friday for a minimum of 50 minutes, either from 1-1:50, or from 2-2:50. Two additional hours in lab are required, but these hours may be completed at other times during the week. The variable Friday lab time allows students to pre-register in another class meeting MWF at either 1 or 2. CVM has two course numbers. The first includes the lecture and Tuesday lab. This one must be enrolled from the main tree (A, B, or C). The second number allows you to choose one of the two Friday lab times. Please pick the 1 PM Friday time if you can. This Friday section should be added from the Lab portion of the tree. See Dr. A. Jaslow if you have questions.

Environmental Issues in Southern Africa and Namibia Maymester

BIOL 212 Environmental Issues in Southern Africa will be offered this fall. In this lecture course, we take an interdisciplinary approach to examine the environmental issues of a region of the world famous for its captivating scenery, immense diversity, scarcity of natural resources, and cultural diversity. Special attention will be devoted to the role of parks and community-based conservation projects in achieving a balance between people's needs and wildlife conservation. Prerequisites are BIOL 130/131 and 140/141 or BIOL 120 and CHEM 120. By itself, BIOL 212 satisfies an upper level course without lab for the Biology major. When BIOL 212 is combined with the Maymester course, BIOL 214 Environmental Field Study in Namibia, they together will count as an upper-level Biology course with laboratory and will fulfill the F11 requirement (see description of BIOL 214 below).

Maymester Course: BIOL 214 Environmental Field Study in Namibia is tentatively scheduled for May, 2019 if a minimum of students enroll. The course visits the Namib Desert, dry thornveld savannas, and the Kalahari sands, along with meeting indigenous people, NGOs,

(continued on page 4)



Optimal Foraging

The following courses
will be offered next semester

Number	Course Title	Hours Offered
120*	Intro to Environmental Science (Kelly)	MWF 11:00-11:50; T lab 12:30-3:30
130	Biology I (5 sections)	MWF 10:00-10:50, 11:00-11:50 TR 8:00-9:15, 9:30-10:45, 11:00-12:15
131	Biology I Lab (8 sections)	T 12:30-3:30, 4:00-7:00 W 1:00-4:00, R 12:30-3:30, F 1:00-4:00
200	Evolution (Laport)	TR 8:00-9:15, R lab 12:30-3:30
207	Animal Behavior (Boyle)	MWF 8:00-8:50, W lab 1:00-4:00
212	Envir. Iss. in Southern Africa (Collins)	TR 11:00-12:15
301	Microbiology (Frawley)	MWF 9:00-9:50; R lab 12:30-3:30
304	Genetics (Miller)	TR 9:30-10:45; T lab 12:30-3:30
307	Cell Biology (Hill)	TR 8:00-9:15
315	Ecology (Collins)	TR 9:30-10:45; M lab 1:00-4:00
325	Molecular Biology (Wheeler)	MWF 8:00-8:50; R Lab 12:30-3:30
350	Comp. Vert. Morph. (AJaslow)	MWF 9:00-9:50; T lab 12:30-3:30 F lab 1:00-2:00 or 2:00-3:00
360	Histology (CJaslow)	MWF 8:00-8:50; W lab 1:00-4:00
375	Neuroendocrinology (Kabelik)	MWF 10:00-10:50, M lab 1:00-5:00
BMB 310	Methods in Cell Biology (Hill)	W 1:00-5:00
CHEM 414†	Biochemistry (Stoddard, Loprete)	MWF 11:00-11:50, TR 11:00-12:15
CHEM 416†	Mechanisms of Drug Action (Jackson-Hayes)	TR 9:30-10:45
NEUR 270†	Neuroscience (Klatzkin)	MWF 9:00-9:50, 10:00-10:50
Senior Seminar Sections		
485	Ecology and Evolution (Haddad)	MWF 11:00-11:50
Courses for non-majors (fulfill the F7 requirement)		
105*	Vertebrate Ecology and Conservation (Pike)	TR 2:00-3:15 M or W lab 1:00-4:00

*Does not count toward Biology major

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

(continued from page 3)

and governmental officers involved in local environmental issues. This 4-credit Maymester course in Namibia (BIOL 214) may be combined with the 4-credit Environmental Issues in Southern Africa course (BIOL 212) course at Rhodes to fulfill one upper-level Biology course with lab, an Environmental Science elective, and the F11 requirement. If you are looking for an opportunity to travel and study in an amazing location, talk to Dr. Collins, who will be offering the course, and keep an eye out in October for notices announcing an informational meeting about it.

What's Up for Next Spring?

In the spring of 2019 we tentatively plan to offer the following classes: Animal Physiology, Conservation Biology, Embryology, Entomology, Genetics, Mechanisms of Development, Microbiology, Molecular Biology, Molecular & Cellular Neuroscience (with lab now), Plant Biology, and Topics in Biomedical Science. Spring will also likely include sections of Biochemistry and Neuroscience (but not Mechanisms of Drug Action or GIS). If our staffing and the student demand are both sufficient, we plan to offer the Environmental Field Study in Namibia during the 2019 Maymester.



Dr. Wheeler and Dr. Honsa, Halloween Party 2017



Dr. Lindquister as Nano Drop



Dr. Fitz Gerald as a jellyfish with GFP

BIOLOGY DEPARTMENT LUMINESCENCE

Tales from the Front by Sarah Morris BMB '18

Advice from Seniors to students considering majors in Biology or Biology Interdisciplinary Programs

Environmental Science

Erin Gleeson: I chose the environmental science major at Rhodes because I knew I loved biology, but I also wanted to take courses in political science, economics, and anthropology. I participated in the Semester in Environmental Science (SES) program in Woods Hole, MA, and it changed the trajectory of my undergraduate career. SES gave me the opportunity to work with the top scientists studying the ecological effects of climate change all over the globe. I continued to work with one of these scientists on a research project in Alaska, and I am now still working on this research remotely in Memphis. These opportunities would not have been available to me without SES so I would highly recommend it to any interested underclassmen.

Griffin Williams: Don't be afraid to talk to your professors or upperclassmen. Talk to them about anything from classes, research, a cool thing you read, or even just daily life. Hearing what others have done and what they liked or didn't like about their college experience can help you immensely along the way.

BMB

Rachel Windmueller: My advice to future BMB majors: do not be afraid of Dr. Terry Hill. Look past the funky Hawaiian shirts and possible dent in your GPA, and you will find an improved version of yourself as a learner waiting at the end of the semester. The lessons of cell biology and other courses taught by Dr. Hill are not parts of the cell, but rather how the average student can move from memorization and regurgitation to analysis and exploration. Anyone who has taken a course from Dr. Hill will say it is worth the work.

Mac Williamson: If you're planning to pursue graduate school after your time at Rhodes, be sure to look around the Biology department to see what kind of research is taking place. It can be a little intimidating, especially if you intend to start research during your first year at Rhodes, but the experience is extremely rewarding and strengthens your understanding of the concepts learned in upper-level Biology courses. I think the most important things in being able to get the most out of the BMB major are to get involved in research you enjoy, work hard at your courses (because they can be demanding), and don't be afraid to make mistakes and be willing to learn from them--the cooperative atmosphere within the BMB major is great, and everyone wants to see you succeed.

Neuroscience

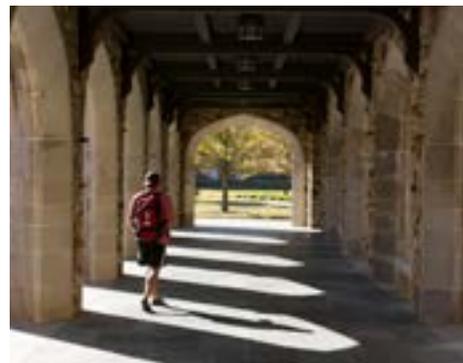
Ellie Fratt: I knew going in to college that I wanted to major in Neuroscience, and the interdisciplinary nature of the Neuro major here was exactly what I was looking for. The flexibility allowed me to develop an interest in Chemistry, conduct research, and even study abroad during my four years.

Alex Bartlett: Dr. Dougherty greatly influenced my decision to major in Neuroscience because she is instructive, energetic, and her excitement for neuroscience is contagious. Since my decision, Neuroscience course work at Rhodes College has combined all the fields of science I have studied into one, and choosing this major has allowed me to incorporate my passion for music through courses like Music and Healing, Brain Disorders, and Psychology of Music. The future advancements that drive this field offer numerous possibilities for research and medicine, and Rhodes provides ample resources for clinical and research opportunities through partnerships with St. Jude Children's Research Hospital, Le Bonheur Children's Hospital, and University of Tennessee Health and Science Center. Ultimately this department and its professors want their students to succeed, and it shows.

Biology

Ben Aiken: Deciding to become a biology major was a daunting task as a freshman. Getting through an intro bio course meant changing the way you operated in high school. Persistence and sheer hard work paid off though, because entering into sophomore year meant exploring the many upper level biology courses Rhodes had to offer. My all-time favorite being Comparative Vertebrate Morphology with Professor Alan Jaslow. If you are looking for the ultimate dissection class, then Dr. Jaslow is your man. Not only will you learn the anatomy of several different vertebrates (which is very relevant to human anatomy), but Professor Jaslow creates a relaxed atmosphere that fosters a sense of community within the classroom.

Iqra Siddiq: As a senior currently applying to medical school, my Biology major has helped me prepare for all aspects of the application process. The interdisciplinary nature of the Biology major allowed me to take classes that fulfilled my major requirements, fulfilled medical school prerequisites, and prepared me for the MCAT. During my final year at Rhodes, I took Histology and Genetics, which will prepare me for medical school classes both through the information I learned and the study skills I developed. I would also recommend the University of Tennessee Family Medicine Premed Internship for students interested in pursuing medicine; this experience cemented my desire to pursue the medical profession.





Signals & Displays

Short Communications

Tri-Beta News

Beta Beta Beta ($\beta\beta\beta$) is a national biological honor society with an active chapter at Rhodes. $\beta\beta\beta$ 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. $\beta\beta\beta$ provides a forum to recognize those students, with a biological science as their undergraduate major, who excel academically. Note that Rhodes has an array of biological science disciplines, meaning there are $\beta\beta\beta$ 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, Mac Williamson (wilmh-18@rhodes.edu) or vice president, Fatiha Albulahi (abdfa-18@rhodes.edu). Go to www.rhodes.edu/biology/22139.asp for detailed

membership criteria. 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. We are excited to welcome new individuals into the society and congratulate them on their commitment to biological excellence.

\$\$ Biology Research Award \$\$

This spring, the Biology Department will be presenting the "Award for Outstanding Student Research in Biology". Any student 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 30. Announcement of the award winner will be made at spring awards convocation on Friday, April 27th.

Undergraduate Research and Creative Activities Symposium

The Rhodes Undergraduate Research and Creative Activities Symposium (URCAS) provide you the opportunity to showcase your outstanding work to the entire campus community. You will gain first-hand experience in communicating your research and creative activity, an essential part of professional growth. URCAS will take place on Friday, April 27, 2018.

Work in the Biology Department

The Biology Department is looking for students to work as lab Teaching Assistants for the core biology classes next year. These TA positions will consist of approximately 8-10 hours per week of work. We prefer students for this job who have an interest in Biology and have taken Bio I and II. Pay and fur-



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 the Biology Dinosaur coffee mugs for majors! When you complete your declaration of major, stop by the Biology office in FJ 132 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!

ther details concerning being a TA will be discussed on an individual basis. Also, the RSAP position will be available. If you have been a TA for the fall and spring core labs, we encourage you to apply for this upper level position. Please feel free to contact Sarah Hasty at 843-3431 (email: hastys@rhodes.edu) for additional information. Applications for the lab TA job can be found outside FJ 157. The deadline for fall/spring positions is April 20, 2018. Also, if you are interested in working in the Biology Department this summer, please contact Sarah Hasty.



The Hybridization Zone



Environmental Studies and Science Program

In Fall 2018, we will offer **Environmental Issues in Southern Africa** (BIOL 212). In this lecture course, we take an interdisciplinary approach to examine the environmental issues of a region of the world famous for its captivating scenery, immense diversity, scarcity of natural resources, and cultural diversity. Special attention will be devoted to the role of parks and community-based conservation projects in achieving a balance between people's needs and wildlife conservation. By itself, this course satisfies an upper-level course without lab for the Biology major; when combined with Biology 214 (**Environmental Field Study in Namibia**, to be offered in May 2019), the two courses together satisfy a requirement for one upper-level course with laboratory. Please contact Dr. Collins if you are interested.

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 27 – June 21. 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 have any questions.

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. Collins. The SES deadline is March 19 for the Fall 2018 semester. For the 2018-2019 year, INTD 225 Geographic Information Systems (GIS) will only be offered in Fall 2018. ENVS and Biology students should contact Prof. Boyle if they have difficulties getting into the course.

Biochemistry and Molecular Biology

Fall 2018 courses: All three of the core, upper level, BMB lecture courses will be offered fall 2018: BIO 307 (Cell Biology), BIO 325 and 325L (Molecular Biology and lab), and CHEM 414 (Biochemistry). CHEM 416 (Mechanisms of Drug Action), which is normally offered during spring semesters, will be offered only during the fall semester next academic year. The fall semester will include a nice selection of other elective courses as well. Please consult the online course schedule for times and other course information as it is made available.

ASBMB program accreditation kickoff

celebration: On November 30, 2017, Science faculty and students came together for an hour of information, fun, and great food to celebrate the recent accreditation of the Rhodes BMB program by the American Society for Biochemistry and Molecular Biology (ASBMB), which is the discipline's leading national organization. Accreditation affirms the quality of our program, and provides both the program and students tangible benefits. For students, program accreditation allows them the opportunity to earn an ASBMB accredited B.S. degree, which conveys to graduate and professional school admissions teams as well as potential employers the high-level training Rhodes BMB students receive. For the first time in our program, current BMB Seniors will take the ASBMB assessment exam for the opportunity to earn an accredited degree during the spring BMB Senior Seminar.

ASBMB student chapter: A new student chapter has been chartered at Rhodes College! Please look out for meeting announcements and activities. For more information about this organization, please contact the newly elected president ItthipoalN Rasasack.

As always, please feel free to contact program chair Dr. Jackson-Hayes at jacksonhayesL@rhodes.edu if you have questions concerning the BMB program.

Neuroscience Program Announcements

Depth courses now have co-requisite labs:

The NEUR 350 Neuroscience Research Methods course has now been retired. Instead, depth courses will now be offered with accompanying lab sections. In fall, this comprises BIOL 375 Neuroendocrinology and a new depth course PSYC 344 Movement Neuroscience (see LEGO robots below), and in spring we will offer BIOL 376 Molecular and Cellular Neuroscience and PSYC 345 Cognitive Neuroscience.

Brain-controlled LEGO robots: Our new fall depth course, PSYC 344, is entitled Movement Neuroscience. The course description is as follows: The nervous system is remarkable in its ability to learn, plan and control movements. Using a comparative approach from insects to humans, we will explore the neuroscience principles that underlie rhythmic movement, sensory-motor reflexes, motor learning, and decision-making. In the complementary lab portion of the course we will use LEGO robots to learn computational neuroscience techniques. Other lab projects will focus on biosignals, human motor learning and kinematic analysis. Motor disorders such as stroke, amputation, Parkinson's and other diseases will be emphasized, as well as the corresponding approaches to neurorehabilitation.

F1 Foundation Philosophy Neuroscience

courses: Philosophy will now regularly be offering PHIL 330 Philosophy of Cognitive Science and PHIL 340 Philosophy of Neuroscience courses, both of which will count toward the Neuroscience major. We are in the process of accrediting both courses to fulfill the third F1 foundation requirement.

Medicinal/Computational Chemistry: Note that you can also count CHEM 411 as a Neuroscience breadth course if your independent project focuses on a Neuroscience topic.

Clinical Neuroscience: Dr. Klatzkin plans to offer PSYC 318 Clinical Neuroscience, a new incarnation of NEUR 318 Neuroscience of Brain Disorders, as a lecture-only breadth course in 2019-2020 (contingent on sufficient staffing).

Questions? Please email Dr. Kabelik (kabelik@rhodes.edu), the chair of Neuroscience, with any questions that you have about the program.

Student Research 2017-2018

Sponsored by Programs at Rhodes

(Rhodes faculty supervisors listed)

Alapati A NEUR '19, Han J, Peters T, Palmer G, Reiter L A medium throughput compound screen for approved drugs that suppress seizures in Dup15q syndrome, Rhodes UT Neuroscience Institute Fellowship (Dr. David Kabelik)

Alwis Y NEUR '21 Emotional judgments of individual scenes are influenced by unintentional averaging (Dr. Jason Haberman)

Ankersen J '18, **Deery E BIOM '18**, Kesselring C '18, **Middleton C BIOM '18**, and **Olsen E BIOM '18** Using historical data from the 1878 Memphis yellow fever epidemic to estimate transmission rates (Dr. Erin Bodine)

Benfield L '21 Understanding the DNA requirements for heterochromatin establishment in *S. pombe* (Dr. Bayly Wheeler)

Betton B '20, **Olsen E BIOM '18**, Campbell L '19, and **Singh A '19** Analyzing Protein Kinase C interactions with polarized growth-related proteins in the filamentous fungus *Aspergillus nidulans* (Dr. Loretta Jackson-Hayes)

Boardman D '19 Identification of virulent *Vibrio* species from ready-to-eat seafood (Dr. Erin Honsa)

Brookover Z BMB '21 and Ward R BMB '21 Deletion of chitin synthase genes *ChsA* and *CsmA* in *Aspergillus nidulans* (Dr. Terry Hill)

Chen P, Bai B, **Mancieri A NEUR '18**, and Peng J Proteomics and mouse modeling reveal U1 SnRNP and RNA splicing dysfunction in Alzheimer's Disease. St. Jude Children's Research Hospital (Dr. David Kabelik)

Burman E '18, Forehand E '19, Lee W '19, Myers R '18, Wang X '18 Zeng R '18 Spatial and behavioral analyses of captive Nile hippos. (Dr. Sarah Boyle)

Cardona L NEUR '18, Dave P NEUR '19, and **Popescu F BMB/NEUR '20** Vasopressin receptor (V1aR) expression in green anoles (*Anolis carolinensis*) relative to season (breeding versus non-breeding) and sex (male versus female) (Dr. David Kabelik)

Cheang A '21 Ferrari G '20, Myers R '18, Zhang Y '20 Spatial and behavioral analyses of captive African elephants and southern white rhinos. (Dr. Sarah Boyle)

Daniels P BMB '18 Determining the role of ABIN1 in cell death through treatment of immortalized mouse embryonic fibroblasts with apoptotic agents. Dr. Hans Haecker, St. Jude Children's Research Hospital (Dr. Gary Lindquister)

Dillas T '18 Correlating neurovirulence with strain heterogeneity in the UL39 and gK genes of herpes simplex virus. (Dr. Gary Lindquister)

Evans M NEUR '18, DaRosa A NEUR '18, Gaudio E NEUR '19, Mysiewicz S NEUR '19, Velrajan S NEUR '20, Shamambo M NEUR '20, Yu S NEUR '20, Renna C NEUR '20, Siddiq B NEUR '20, and **Van Vliet T NEUR '20** Investigating mechanisms of seizure generation along the longitudinal hippocampal axis in juvenile rats (Dr. Kelly Dougherty).

Hamm L '19 Identifying cross parental regulation in Chip-seq and RNA-seq data (Dr. Jonathan Fitz Gerald)

Healy J ENVS '19, Wang X '18 Examining effects of cryopreservation methods on membrane integrity of amphibian sperm. Memphis Zoo, Dr. Sheila Poo (Dr. Sarah Boyle)

Holton M '20 Understanding the DNA requirements for heterochromatin establishment in *S. pombe* (Dr. Bayly Wheeler)

Hope H ENVS '18 and Smith M '18 Regeneration dynamics of an old growth forest: A case study of Overton Park (Dr. Kimberly Kasper)

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

Jubrial-Jaber L '19, Boyd-Rogers C '18 Examining the effects of aging and cognitive control on reminding and the mnemonic benefit of spaced study (Dr. Geoff Maddox)

Kemper S BMB '19 Mapping the Arabidopsis epigenome through CAPS and AFLP (Dr. Jonathan Fitz Gerald)

Laird W '19 Analysis of the *rop2 atfh5* double mutant (Dr. Jonathan Fitz Gerald)

Mabante M '19 Characterizing a novel, non-reciprocal parental bias on seed size in *chr23-1* mutants (Dr. Jonathan Fitz Gerald)

Martinez T BMB '19, Sedkov Y, Balasubramanian D, Kallappagoudar S Identification of novel interactors with the histone demethylase UTX. Dr. Hans-Martin Herz, St. Jude Children's Research Hospital (Dr. Kimberly Brien)

McDonagh D NEUR '21 Representation of multiple ensembles across visual domains is more precise than within visual domains (Dr. Jason Haberman)

Morris S BMB '18 Assessing mRNA expression for murine and viral interleukin 10 resulting from infection with a recombinant murine gammaherpesvirus. (Dr. Gary Lindquister)

Morris S BMB '18, Iacobucci I, and Mulligan C Genetic alterations in acute erythroid leukemia. St. Jude Children's Research Hospital (Dr. Mary Miller)

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

Myers M BIOM '18 Mathematical model of bimodal interferon-production in response to influenza A virus infection (Dr. Erin Bodine)

Myers R '18 Wild about the Zoo: Research in animal behavior, physiology, and conservation. Dr. Charles Brady, President and CEO, Memphis Zoo (Dr. Sarah Boyle)

Nadel T NEUR '20, Warren M NEUR '19, Hayden E NEUR '18, Cattaneo C NEUR '18, and **Dasani R NEUR '19** Determining how chronic stress alters the relationship between virtual portion size selection and food consumption following mental stress. (Dr. Rebecca Klatzkin)

Myers R '18 and **Porter H NEUR '18**, Phonologically-related intervening names influence spaced retrieval of proper names (Drs. Katie White and Geoff Maddox)

Ouyang A '20 Characterizing new metal transport systems in *Salmonella* Typhimurium (Dr. Elaine Frawley)

Perchik M BMB '19 and Giampapa R BMB '19 DFT analysis of the selectivity of phenylalanine hydroxylase (Dr. Larry Peterson and Dr. Mauricio Cafiero)

Popescu F BMB/NEUR '20 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. Dr. William Kutteh, Fertility Associates of Memphis (Dr. Carolyn Jaslow)

Rowland L BMB '19, Daniels BMB '19, and Beckman S '19 Identification of new genes for cytokinesis in the filamentous fungus *Aspergillus nidulans* (Dr. Terry Hill)

Rowland L BMB '19 Immunoprecipitation and co-immunoprecipitation of GFP-tagged proteins in *Aspergillus nidulans* (Dr. Terry Hill)

Smith P BMB '18 The Contribution of centromeric repeats to the establishment of heterochromatin in *S. pombe* (Dr. Bayly Wheeler)

Smith P BMB '18 Understanding the DNA requirements for heterochromatin establishment in the *S. pombe* (Dr. Bayly Wheeler)

Sommerkamp E '19 Implementing IPASS (a protocol) for patient handoffs between the post-anesthesia care unit and the more general hospital floor. St. Jude Children's Research Hospital, Dr. Jon Burlinson (Dr. Alan Jaslow)

Stovroff M '18 Antibiotic resistant *Vibrio* species from ready-to-eat seafood (Dr. Erin Honsa)

Suresh S NEUR '20 Conceptual size ensembles cannot be predicted by individual item size representations (Dr. Jason Haberman)

Szuwalski J '19 Examining effects of captive breeding on offspring survival and development in amphibians. Memphis Zoo, Dr. Sheila Poo (Dr. Sarah Boyle)

Thomasson S NEUR '19 No change in perceived hand size after Rubber Hand Illusion induction (Dr. Jason Haberman)

Williamson M BMB '18 Localization of Paxillin B in *Aspergillus nidulans* is affected by separate gene modifications (Dr. Terry Hill)

Williamson M BMB '18 Tagging of PaxB and related proteins with dt-Tomato fluorescence epitope in *Aspergillus nidulans* (Dr. Terry Hill)

Yousuf S BMB '19 Expression profiling of manganese transport systems following nitric oxide stress in *Salmonella* Typhimurium (Dr. Elaine Frawley)

ZeeAbrahamsen E NEUR '19 Ensemble representations are robust to noise inherited from the individual item level (Dr. Jason Haberman)

