

BIOFEEDBACK

THE NEWSLETTER OF THE BIOLOGY DEPARTMENT AT RHODES

VOLUME 28

MARCH 2014

NUMBER 2

The Chair's Niche



As I promised in the fall newsletter, changes are continuing to occur in the Biology Department and in FJ. We have worked out a curriculum for '14-'15 that provides more upper-level Biology courses and sections (see Curricular Evolution on page 3). To free up faculty to teach

these courses, we are undergoing another job search, this time to hire someone to help teach in the Introductory Biology labs.

Starting May 12th, the Monday following graduation, Rhodes Tower and the east end of FJ will be closed off for construction. In anticipation of this, some renovations took place over the winter break to clear the east hallway. Those of you looking for Dr. Boyle have hopefully discovered her temporary office in 104E, near FJ-A. We are grateful to Dr. Sturm for allowing his office to be subdivided to provide space for two offices in this room.

Also, I suspect that many of you are likely mourning the loss of the seminar room (I know that I am). This room has been divided to provide a space for the laboratory equipment that will be transferred from the Instrument Room on the east hallway, and to provide an office for our newest Department member, Dr. Kelly Dougherty, who was hired as our molecular neurobiologist.

These changes are only temporary renovations. The construction project on the east end of the building is expected to be completed by July of 2015. Until then, we should expect the rest of FJ to be a bit cramped and noisy, but ultimately, we will be thrilled to have two new teaching labs, and some of the faculty will get to move into new offices and research labs in the renovated space. We will also have our seminar room back!

– Carolyn Jaslow, PhD

Primary Productivity & Secondary Growth

Honors | Awards | Grants | Publications | Meeting Participation

Honors and Awards

At the Mid-South GIS conference on Nov. 14-15, **Alix Matthews, ENVS '14** won a \$2000 scholarship for her presentation, and **Maraia Tremarelli, ENVS '15** and **Mary DuBose, ENVS '14** won 2nd place and 3rd place awards, respectively, for their posters. Details of their research presentations are in the "Meetings" section on the next page.

Dr. Mary Miller and **Braden Taylor '15** received travel awards to support their attending the International American Society for Cell Biology Meeting in New Orleans, LA, in December.

Teddy Huerta '15 was selected into the American Society for Microbiology's Undergraduate Research Capstone Program. This award provides a two-year membership to ASM and \$1500 for travel to the 2014 ASM Meeting in Boston, where Teddy will present his research. Teddy was also recognized for his research participation in the St. Jude Summer Plus program in the January issue of *Cancer*, the research journal published by the American Cancer Society.

Congratulations New Beta Beta Beta honor society members:

The Biology Honor Society, Beta Beta Beta, inducted new members: Seniors: **Nathan Berry, Maggie Blake, Jingwen Chen, Allison Dewar, Caroline Elbaum, Elysia Hassen, Isabelle Hatfield, Robert Lenzi, Sahar Mokhtari, Rebecca Olivarez, Cristine Osteen, Colin Perry, Matthew Roberts, Megan Ververis, and Alexandra Videmsky**; Juniors: **Matthew Cannavo, Currie Carothers, Kevin Chien, Chase Crowell, Tina Dao, Sarah Johnson, Andrew Kerby, Sarah Laves, Phuong Le, Katherine Morrison, Ryan Niedermair, Collin Saleh, Jourdaen Sanchez, Braden Taylor, and Shelby Wikinson.**

New $\beta\beta\beta$ Officers: **Breanna Durbin '15** (President), **Katherine Morrison '15** (Vice President), **Collin Saleh '15** (Secretary), and **Katherine Robinson BMB '15** (Treasurer).

Publications

Boyle SA, Kennedy CM, Torres J, Colman K, Pérez-Estigarribia PE, de la Sancha NU. 2014. High-resolution satellite imagery is an important yet underutilized resource in conservation biology. *PLoS ONE* 9:e86908.

Boyle SA, Lenz BB, Gilbert KA, Spironello WR, Gómez MS, Setz EZF, dos Reis AM, da Silva OF, Keuroghlian A, Pinto F. The primates of the Biological Dynamics of Forest Fragments Project: a history. In *Primates in Fragments: Complexity and Resilience*. Marsh, L. K. and C. A. Chapman (eds.), Springer: New York, pp. 57-74.

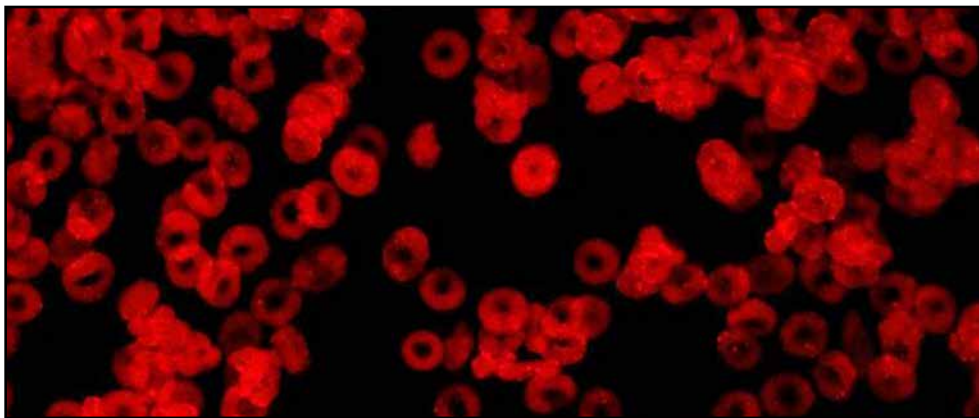
Connor EF, **Collins MD**, Simberloff, D.S. 2013. The checkered history of checkerboard distributions. *Ecology* 94:2403-2414.

Meetings

Matthews AE '14, Hanson AA '15, Ellis, V.A., **Roberts JR '14, Collins MD**. Oral presentation: Avian malaria parasites in East Tennessee birds. Tennessee Ornithological Society. Chicago, IL (September 2013)

Badami SM '14, Blustein EC '14, Bystrak D, Relyea GE, **Collins MD**. Oral presentation: Changes in avian body sizes in response to climate change. Tennessee Ornithological Society. Chicago, IL (September 2013) and American Chemical Society Strengthening Bonds Undergraduate Symposium. Memphis, TN (October 2013)

Hanson AA '15, Matthews AE '14, Ellis VA, **Roberts JR '14, Collins MD**. Poster Presentation: Avian malaria in East Tennessee. American Chemical Society Strengthening Bonds Undergraduate Symposium. Memphis, TN (October 2013)



The protein, Ankyrin, in human red blood cells. Photo submitted by Laura Luque de Johnson.

Yu AJ '13, Rahimi-Saber A '13, Jaslow CR, Kuttteh WK, Ke RW. Poster presentation: The diagnosis of polycystic ovarian syndrome is an independent risk factor for pre-diabetes (elevated hemoglobin A1c) in overweight, obese, and morbidly obese women. American Society for Reproductive Medicine Meeting. Boston, MA (October, 2013).

Matthews AE ENVS '14. Oral presentation: Loggerhead shrike (*Lanius ludovicianus*): GIS analysis of population decline across Arkansas. Mid-South GIS conference. Memphis, TN (November 2013).

Tremarelli M ENVS '15. Poster presentation: Hurricane Sandy: Who was affected and who was helped. Mid-South GIS conference. Memphis, TN (November 2013).

DuBose M ENVS '14. Poster presentation: Access to outdoor recreation in Davidson County and Shelby County, Tennessee. Mid-South GIS conference. Memphis, TN (November 2013).

Taylor B '15, Bierle L '12, Middleton S, Hanson P CHEM '96, Miller M. Poster presentation: Exposure to ruthenium-based chemotherapeutic KP1019 induces a RAD9-dependent DNA damage response in *S. cerevisiae*. American Society for Cell Biology. New Orleans, LA (December 2013).

Miller M, Hanson P CHEM '96. Poster Presentation: Integration of research into undergraduate genetics laboratory positively impacts student attitudes and self-reported learning gains. American Society for Cell Biology. New Orleans, LA (December 2013).

Departmental Migrations



Ms. Dianne Russell-Cox has joined the Biology Department as the interim Departmental Assistant. Dianne may be new to the Biology Department but may be a familiar face around campus. She has previously worked in the Department of Physics and also the Dean of Faculty's office. She is a graduate of the University of Mississippi. In her spare time, she likes to spend time with her daughter, Amery. She also enjoys cooking and traveling.

Please stop by the office sometime to introduce yourself and to welcome Dianne.



Curricular Evolution Faculty & Course Updates

2014 - 2015

Course Mutations, Duplications, and Inversions

In response to the increased demand for upper-level Biology courses and the feedback we received on our course survey, the Biology Department has instituted the following changes to the 2014-15 curriculum.

Mutations (new courses)

This fall, Dr. Miller will be on sabbatical leave and will not be teaching her Genetics class (BIOL 304). Instead, Dr. Fitz Gerald will be introducing a new course, **BIOL 303, Genetics without Laboratory**, as an alternative to BIOL 304 (see right). Although Genetics lab is a valuable experience, especially for students seeking careers in research, it is not necessary for many of those who want Genetics to prepare for the MCAT, or who are taking it as a requirement for certain graduate programs (e.g. some Veterinary Schools). If you are one of these students, a Genetics course without lab may fulfill your curricular needs, especially if you belong to one of the interdisciplinary programs that do not have a laboratory requirement for the major (e.g., Neuroscience). If you aren't sure whether Genetics without Laboratory is appropriate for you or works for your major, talk to your adviser or to the Health Professions adviser, Dr. A. Jaslow. Because BIOL 303 is a non-lab course, it can enroll twice as many students as BIOL 304, which should help to satisfy some of the demand for Genetics. If you are hoping to take Genetics with lab in '14-'15, Dr. Miller will be teaching BIOL 304 in the spring semester.

BIOL 303 Genetics without Laboratory MWF 9:00-9:50 (Dr. Fitz Gerald)

"Genetics" can be easily defined as the process of trait inheritance from parents to offspring. On the surface this might seem simple, yet genetic analysis has remained one of the most powerful tools in biology for over a century. Recent technological revolutions in DNA sequencing and genetic engineering have further redefined the scope and power of the field. Having a strong foundation in genetics could become essential for most fields of biology and medicine in the decades to come.

In Genetics 303, we will begin with studies of population and transmission genetics prior to 1953, then examine the physical basis of inheritance: DNA sequence and structure. These introductory concepts will provide the guiding principles of molecular genetics as we develop a modern tool box for exploring biological questions ranging from individual traits to molecular systems to whole-genome approaches. We will then take a step beyond the genome to understand the epigenetic forces that govern inheritance. Finally, we will look at advances made within the past few years and analyze their impact on medical diagnostics and therapies, genetic counseling, global food shortages, and adaptation.

As there is no lab associated with this course, we will rely on applied take-home projects to achieve many of our learning goals.

Another new course to be added to the curriculum is **BIOL 376 Molecular Neurobiology**. This spring course will be taught by our new department member, Dr. Kelly Dougherty, who will begin this

fall. Details about this course will be provided in the fall issue of *BIOFEEDBACK*.

Although it's not a new course, **BIOL 207 Animal Behavior** will no longer carry the F2i designation. It will still have the F11 designation associated with it.

Duplications (more sections)

Two other courses that have been in high demand recently are **BIOL 325 Molecular Biology**, which is a requirement for the BMB major, and **BIOL 301 Microbiology**. To address these needs, we have added more sections of both courses.

Microbiology will be offered three times in '14-15. Dr. Luque de Johnson will teach one section in the fall and another in the spring, and Dr. Doherty will teach an additional spring section.

For Molecular Biology, Dr. Lindquister will teach a double section in the fall (one big lecture of 32 students with two lab sections) and a class of 16 in the spring for those who were unable to get into the fall sections.

Inversions (courses in different semesters)

To accommodate the new courses and other changes, some courses will be offered in different semesters. **BIOL 200 Evolution** will be taught in the fall, and **BIOL 253 Plant Genetics & Diversity**, a course introduced just last year, will be offered next spring.



Other Courses that Count for the Bio Major:

When planning your schedule, keep in mind that **Biochemistry (CHEM 414)**, **Mechanisms of Drug Action (CHEM 416)**, and **Neuroscience (NEUR 270)**, with and without the **Neuroscience Methods lab (NEUR 350)** may count as upper-level Biology courses, but students may count no more than two of these courses toward their major.

Comparative Vertebrate Morphology (BIOL 350)

CVM will again be offered with two 10 AM lectures most weeks and two (unequal) formal lab meetings a week. One lab meets Tuesday from 12:30-3:30. The second lab meets Friday each week 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 register in another class meeting MWF at either 1 or 2 PM. 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 any questions.

What's Up for Next Spring?

In the spring of 2015, we expect to offer the following upper-level Biology classes: Vertebrate Life, Mechanisms of Development, Plant Genetics and Diversity, two sections of Microbiology, Genetics, Molecular Biology, Animal Physiology, Molecular Neurobiology, Topics in Biomedical Science, and two additional upper level classes TBA. One of these is expected to be an organismal course with a lab or field component to help fulfill some of the demand from students interested in Environmental Science. The other will likely be a non-lab course with

the topic to be determined. Spring will also include sections of Neuroscience, Biochemistry, and Mechanisms of Drug Action. Finally, another course planned for spring is Environmental Issues in Southern Africa, which includes a Maymester field

trip to Namibia. Bear in mind that this list of courses is tentative and could change if unexpected circumstances arise. In particular, the field course to Namibia will only be offered if it has adequate enrollment.



Senior Seminar Lottery

Wednesday, March 19th at noon in FJ 143w

Next year, the Biology Department will offer four sections of Biology Senior Seminar: two 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 143w at noon on Wednesday, March 19th.** 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, or are planning to graduate in December, contact Dr. C. Jaslow immediately.

Senior Seminar Choices for '14-'15

Fall Senior Seminars

BIOL 485-1: Microbiomes.
TuTh 11:00-12:15. Dr. Mary Doherty.

Microbiomes are the ecological communities of commensal, symbiotic and pathogenic microorganisms that share our space. The human body contains over 10 times more microbial cells than human cells, and the roles of the human microbiome in health and disease have emerged as key areas of biological interest. Microbiomes are also being

studied in many other environments, including soil, seawater, and freshwater systems. The data that are generated to characterize environments and ecosystems by microbial composition and interaction are being used to test new ecological and evolutionary theories. In this seminar we will read and discuss topics in the primary literature on microbiomes ranging from community structure and biomolecular functions, to functional meta'omics approaches. Topics covered will include human health, environmental science and ecology, and coevolution of microbiome with host organisms. Students will be able to research a topic in their area of interest and disseminate their findings to the class through a written paper and oral presentation.

BIOL 485-2: Avian Biology.
TuTh 3:45-5:00. Dr. Michael Collins.

This fall seminar will cover a wide range of topics including urban ecology, wildlife diseases, community ecology, evolution, physiology, and conservation biology of birds. Students will read and present background information from the primary literature. Students will research topics of their own interest that relate to avian biology, summarize their findings to the class, and evaluate the presentations of other students.

Spring Senior Seminars

BIOL 486-1: Reproductive Biology.
TuTh 11:00-12:15. Dr. Carolyn Jaslow.

The first half of this seminar will focus on human reproduction, with students reading and presenting background information and primary literature on pre-assigned topics such as sperm maturation



Optimal Foraging

The following courses will be offered next semester

Number	Course Title	Hours Offered
120	Intro to Environmental Sciences*	MWF 11:00-11:50, Mon lab 1:00-4:00
130	Biology I (4 sections)	MWF 9:00-9:50 or 10:00-10:50 TuTh 8:00-9:15 or 11:00-12:15
131	Biology I Lab (8 sections)	Tu 12:30-3:30, Wed 1:00-4:00, Th 12:30- 3:30, Th 4:00-7:00, or Fri 1:00-4:00
200	Evolution (Jabaily)	TuTh 9:30-10:45, Wed lab 1:00-4:00
207	Animal Behavior (Boyle)	MWF 8:00-8:50, Mon lab 1:00-4:00
301	Microbiology (Luque de Johnson)	MWF 11:00-11:50, Wed lab 1:00-4:00
303	Genetics w/o Lab (Fitz Gerald)	MWF 9:00-9:50
307	Cell Biology (Hill)	TuTh 8:00-9:15
315	Ecology (Collins)	TuTh 9:30-10:45, Th lab 12:30-3:30
325	Molecular Biology (Lindquester)	MWF 10:00-10:50, Tu or Th lab 12:30-3:30
330	Virology/Immunology (Sturm)	MWF 8:00-8:50
350	Comp Vert Morph (AJaslow)	MWF 10:00-10:50, Tu lab 12:30-3:30; Fri lab 1:00-2:00 or 2:00-3:00
360	Histology (CJaslow)	MWF 8:00-8:50, Wed lab 1:00-4:00
375	Neuroendocrinology (Kabelik)	MWF 9:00-9:50
BMB 310	Methods in Biochemistry and Cell Biology (Hill)	W 1:00-5:00
CHEM 414	Biochemistry (Loprete)	MWF 11:00-11:50
NEUR 270	Neuroscience (Gerecke)	MWF 9:00-9:50
NEUR 350	Neuroscience Research Methods (Kabelik, Gerecke, Klatzkin)	Th 3:30-4:45, M lab or T lab (1-5 pm)

Senior Seminar Sections

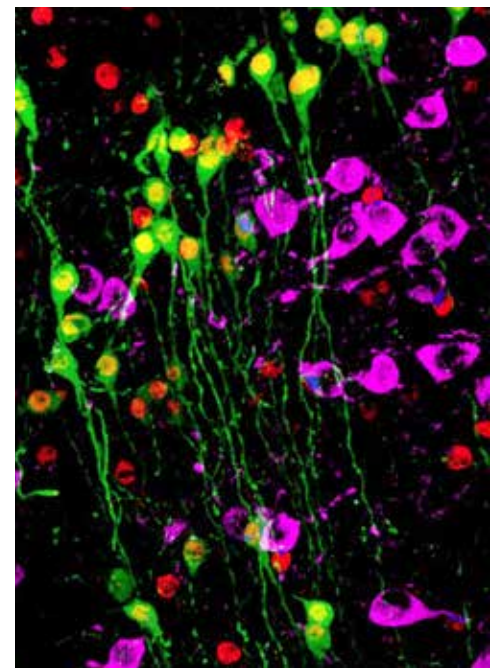
485-01	Senior Seminar Microbiomes (Doherty)	TuTh 11:00-12:15
485-02	Senior Seminar Avian Biology (Collins)	TuTh 3:45-5:00

*Does not count towards the Biology major

and hormonal control of egg development. During the second half of the semester, students will select a topic to research and present concerning any aspect of reproductive biology, from human issues (male contraception, immunology and the fetus) to other topics (parthenogenesis, variation in placentas). All students will be responsible for submitting summaries and discussion questions from the assigned readings, and for evaluating one another's work.

BIOL 486-2: Medical Mycology. TuTh 3:45-5:00. Dr. Terry Hill.

This course will focus on fungal pathogens of humans and other animals through student-selected topics. Example topics from previous seminars have included molecular mechanisms of pathogenesis, the ecology of fungal pathogens, emerging fungal diseases, cellular aspects of development, molecular biology of drug therapy and drug resistance, and recent advances in vaccine development, among several other topics. Students will select and present recent research from the primary literature and lead class discussions in their topics. All students will be responsible for submitting summaries and discussion questions from the assigned readings and for evaluating one another's work. A student-written and student-graded final exam will be one component of the final grade.



Hypothalamic neurons in a male zebra finch.
Photo submitted by David Kabelik.

Signals & Displays

Short Communications



βββ President Breanna Durbin, Treasurer Katherine Robinson, Vice President Katherine Morrison and member Currie Carothers at the Shelby County Family and Community Fair.

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, Breanna Durbin (durbl-15@rhodes.edu) or vice president, Katherine Morrison (morkj-15@rhodes.edu).

Go to www.rhodes.edu/biology/22139.asp for detailed membership criteria.

Tri-Beta has some exciting service projects planned for the spring. One such ongoing project entails hosting monthly meetings with the Springdale Elementary School's Science Club. This spring the meetings will be held February 11th, March 14th, and April 8th from 3:30-4:30. We will also be volunteering at Rites to Play.

We recently participated in the Shelby County Schools Family and Community Fair where we gave a presentation on genetics to local grade school students interested in potentially pursuing the sciences in the future. Finally, we will be volunteering at Springdale Science Saturday events. One of those was held January 18th and another will be held in April.

Additionally, we are selling Rhodes College Biology t-shirts with a graphic version of our recently retired token FJ dinosaur. The shirts are \$10.00 and if you wish to order one, please email Katherine Robinson at robkm-15@rhodes.edu with your size and Rhodes box number.



Finally, we inducted new members on Wednesday November 20th. We are excited to welcome those individuals into the society and congratulate them on their commitment to biological excellence. Pictures of βββ events can be seen on the βββ bulletin board outside of the Biology Department office.

\$\$ 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. Luque de Johnson by Friday, March 28th. Announcement of the award winner will be made at spring awards convocation on Friday, April 25th.

TN Academy of Science Meeting

The annual Western Collegiate Division Meeting of the Tennessee Academy of Sciences (TAS) meeting will be held Saturday, April 5, at Christian Brothers University. Abstracts are due March 21. Come see presentations by students from regional colleges and universities, including presentations by Rhodes students. If you would like information about presenting at or attending TAS, please contact Dr. Sarah Boyle.



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 25, 2014.

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 further 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 room FJ 102E. The deadline for fall/spring positions is April 25, 2014. Also, if you are interested in working in the Biology Department this summer, please contact Sarah Hasty.

The Hybridization Zone



Biochemistry and Molecular Biology Program

The Biochemistry and Molecular Biology Program recently welcomed our class of 2015 with our annual "lab coat party". Our seniors challenged our juniors to a scavenger hunt where three hard working juniors walked away with big carbohydrate rewards. We send heartfelt congratulations to our BMB graduates of 2014! Big news for BMB 310: from now on **the Methods in Biochemistry and Molecular Biology course (BMB 310) will earn 4 credits instead of 2**. Remember this as you plan your schedule for next year. Best wishes from the BMB program committee, we hope for the perfect annealing conditions for everyone's hybridizations!

– Dr. Mary Miller

Neuroscience Program

Next year, the Neuroscience Program will be welcoming two new faculty: Dr. Kelly Dougherty (a molecular neurobiologist conducting electrophysiological research into epilepsy) will join the Biology Department in Fall 2014 and Dr. Jason Haberman (a cognitive neuroscientist conducting visual processing research) will join the Psychology Department in Spring 2015. In terms of courses, we will be offering **NEUR270: Neuroscience** in both semesters and **NEUR350: Neuroscience Research Methods** in

the fall semester. Also, a new course titled "**Molecular Neurobiology**" will be offered in Spring 2015, serving as both a lecture-only upper-level course for Biology majors and as a depth requirement alternate to **BIOL375: Neuroendocrinology** for Neuroscience majors. The Molecular Neurobiology course will cover molecular, cellular, and developmental aspects of nervous system structure and function.

– Dr. David Kabelik

Environmental Science and Studies Program

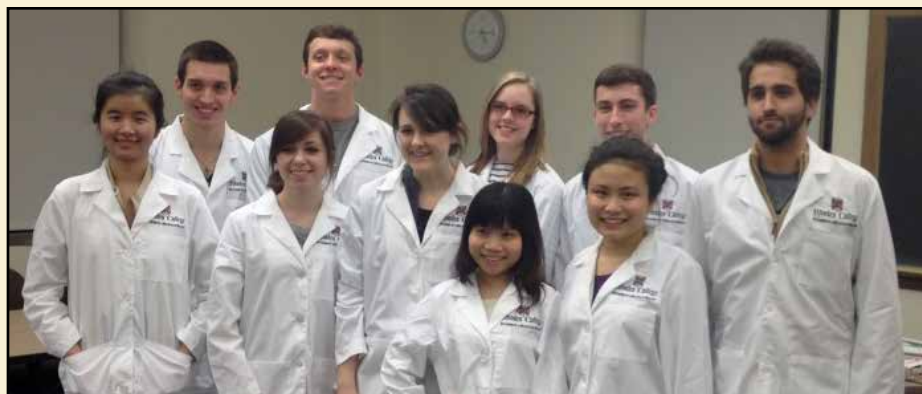
In addition to the regular schedule of courses for the Fall semester, **GIS** will be offered in 2014-2015 in both the Fall and Spring semesters. We also encourage majors and minors to take **BIOL 120** Introduction to Environmental Science as early as possible (preferably as a sophomore).

– Dr. Sarah Boyle

Biomathematics Major

The Biology and the Mathematics and Computer Science Departments have created a new interdisciplinary major in Biomathematics. For details about the major and its course requirements, consult Dr. Jonathan Fitz Gerald in Biology or Dr. Mike Sheard in Math.

– Dr. Carolyn Jaslow



BMB Lab Coat Party. Tina Dao '15, Katherine Robinson '15, Anna Stachura '15, Phuong Le '15, Hanna Lin '15, Richard McGuire '15, Blake Harrell '15, Stephanie Smith '14, Matthew Cannavo '15, Lance Myers '15

Student Research 2013 - 2014

Sponsored by Programs at Rhodes College

(Rhodes faculty supervisors listed)

Badami S '14, Blustein E '14. Changes in avian body sizes in response to climate change. (Dr. Michael Collins)

Blake M '14. Adrenocorticoid activity in captive polar bears: relationship to reproductive and stress management. Dr. Katrina Knott, Memphis Zoo. (Dr. Sarah Boyle)

Blatt E BMB '16. PDS1 response to KP1019 dependent cell cycle defects in *S. cerevisiae*. (Dr. Mary Miller)

Burke S BMB '14. KP1019 dependent spindle defects in *S. cerevisiae*. (Dr. Mary Miller)

Carwile M '16, Lowrance E '15, Mattancheril S '14, Moore R ENVS '14, Tews A '16. Behavioral and spatial patterns of African elephants & Nile hippos. (Dr. Sarah Boyle)

Choudhury S NEUR '15, Hartline J '16, Smith A NEUR '16. Associations between hypothalamic neural activity and social behaviors in anole lizards. (Dr. David Kabelik)

Clifton S '16, Howard A '15, Lipman M '15. Morphological, morphometric, and molecular characterization of hemoparasites from naturally infected small mammals from Paraguay. (Dr. Laura Luque de Johnson)

Croft A '14. Understanding the role of transcription factors in normal mammary gland development and in transgenic mouse models of breast cancer, particularly the oxygen-sensitive Hypoxia-Inducible Factor (HIF)-1 α protein. Dr. Tiffany Seagroves, University of Tennessee Health Science Center Department of Pathology. (Dr. Gary Lindquester)

DuBose M ENVS '14. Plant diversity in pitheciid diets across South America. (Dr. Sarah Boyle)

DuBose M ENVS '14, Sieben T ENVS '15. Spatial ecology of trees at the Memphis Zoo. (Dr. Sarah Boyle)

Durbin B '15. Phenotypic characterization and double mutant study of ROP2 and AtFH5 in *Arabidopsis thaliana*. (Dr. Jonathan Fitz Gerald)

Hanson A '15, Jackson E '16, Klusman M '14, Trychta M '16, Videmsky A '14. Avian malaria in South American bird communities. (Dr. Michael Collins)

Harvey T '17, Rao R '16 Phosphorylation state of erythrocyte protein Band 3 after binding of *Plasmodium falciparum* protein EBA-175 to Glycophorin A. (Dr. Laura Luque de Johnson)

Hayward E '16. The search for small molecule inhibitors of BMP4 in the WNT signaling pathway. Dr. Jie Zheng, Structural Biology, St. Jude Children's Research Hospital (Dr. David Kabelik)

Haymore J '15. Describing the genetic architecture of parental conflict between Cape Verde Island and Landsberg erecta *Arabidopsis* lines by using recombinant inbred lines within a NCIII design. (Dr. Jonathan Fitz Gerald)

Hohlt A MUS '16, Haugen B BMB '17. Identification and cloning of the "Sponge Bob" cell wall integrity mutation in *Aspergillus nidulans*. (Dr. Terry Hill)

Huerta T '15. Impact of Astrovirus on cell adhesion complexes. Dr. Stacey Schultz-Cherry at St. Jude Children's Research Hospital. (Dr. Laura Luque de Johnson)

Jezeq A '15. Understanding the correlation between increased dosage of UBE3A resulting from a maternally derived duplication on chromosome 15q and idiopathic autism through a Drosophila suppressor/enhancer screen. Dr. Larry Reiter, University of Tennessee Health Science Center Department of Neurology. (Dr. Gary Lindquester)

Johnson A NEUR '15. Immunohistochemical colocalization of mesotocin and corticotropin-releasing hormone activity in the female green anole brain following courtship encounters. (Dr. David Kabelik)

Julien A NEURO '14. Aggression, altruism, and sexual behavior in the vampire bat, *Desmodus rotundus* and The development of massage collection, storage, and characterization of bull snake (*Pituophis catenifer*) ejaculates. Dr. Beth Roberts, Memphis Zoo. (Dr. Sarah Boyle)

Laves S '15. Medication safety and outcomes. Dr. James Hoffman at St. Jude Children's Research Hospital and Dr. Jorge Morales at the Calvo Mackenna Hospital in Santiago, Chile. (Dr. Laura Luque de Johnson)

Le P '15. Creating transgenic reporters to visualize Rop2 dynamics in *Arabidopsis thaliana*. (Dr. Jonathan Fitz Gerald)

Leavelle S '14. Big cat behavior associated with husbandry schedules. (Dr. Sarah Boyle)

Lenny B BMB '16. Sequencing of the PaxB gene from *Aspergillus nidulans*. (Dr. Terry Hill)

Magruder S '16. Immunohistochemical colocalization of mesotocin and corticotropin-releasing hormone activity in the male brown anole brain following social encounters. (Dr. David Kabelik)

Malanchuk J '14. Avian malaria in the ducks of West Tennessee. (Dr. Michael Collins)

Marshall J ENVS '14. The development of massage collection, storage, and characterization of bull snake (*Pituophis catenifer*) ejaculates and Reproductive endocrinology and behavior of Sumatran tigers (*Panthera tigris sumatrae*), Dr. Beth Roberts, Memphis Zoo. (Dr. Sarah Boyle)

Matthews A '14, Roberts J '14. Avian malaria parasites in East Tennessee birds. (Dr. Michael Collins)

Reich K BMB '14. KP1019 dependent cell cycle arrest in *S. cerevisiae*. (Dr. Mary Miller)

Shore S '16. Exploring the roles of Shisa2 and Pdgfrl in zebrafish hematopoietic development. Dr. Wilson Clements, Hematology, St. Jude Children's Research Hospital (Dr. David Kabelik)

Smith B '16. Positional mapping of Polycomb-independent parental activities that modify seed-size and maternal gene-expression. (Dr. Jonathan Fitz Gerald)

Vancil A '15. Identification of the sepD5 cytokinesis mutation in *Aspergillus nidulans*. (Dr. Terry Hill)

Wendt K BMB '14. Identification and Characterization of the sepG1 cytokinesis mutation in *Aspergillus nidulans*. (Dr. Terry Hill)

Wilson T '16. Molecular mechanisms of leukemogenesis. Dr. Tanja Gruber at St. Jude Children's Research Hospital. (Dr. Laura Luque de Johnson)



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