

# BIOFEEDBACK

THE NEWSLETTER OF THE BIOLOGY DEPARTMENT AT RHODES

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NUMBER 1

## The Chair's Niche



The last time I wrote this column, I was acting chair during Dr. Lindquenter's sabbatical in the spring of 2010. The topic then was how much our department had grown and changed with the arrival of many new faculty and staff. Although we have continued to add

new faculty and staff (please see

welcomes on p. 5), the biggest changes now are structural ones. You have already seen the new lobby with doors we can open without risk of life and limb. The space is a little bare at the moment, but we hope to get some comfy furniture in there soon. We sadly miss our dinosaur, but we saved its head and are working on ideas either to display it or to keep its spirit alive in the lobby. If you have any suggestions for the lobby, dino-related or otherwise, please share them with us. Renovation of the FJ lobby is only the prelude to the bigger changes that will be coming in Rhodes' science facilities. Thanks in part to a \$4.4 million gift from the Plough Foundation, construction in Rhodes Tower should begin in May, and will create new teaching and research spaces for Environmental Science and Neuroscience in the east end of the building. Additional facilities and renovations are hopefully just a little further down the road, so we all should expect the changes to keep on coming. It looks like it will be an exciting time ahead!

– Carolyn Jaslow, PhD



### Congratulations

**William Porter '16** and **Emily Cerrito '16** received the Award for Excellence in First-Year Biology.

**Harrison Daniel '13** and **Shannon Blair '13** were given the Outstanding Biology Senior Award for the '12-13 academic year.

**Adiha Khan '13** was presented the award for Outstanding in Research in Biology.

**Lucas Laudermilk BMB '13** received the BMB Outstanding Research Award.

**Kimber Jones '13** was presented the Rhodes Early Career Award in Environmental Sciences and Studies.

**Alix Matthews ENVS '14** received the Rosanna Cappellato Memorial Award.

**Madeline Scott NEUR '13** received the Outstanding Senior in Neuroscience Award and the Hunter

Award for Excellence in Neuroscience.

**Ellen Dahl, BMB '14** received an Outstanding Presentation Award for her talk at the Society for Developmental Biology's Southeast Regional Meeting at Vanderbilt University. Typically, the SDB honors only the best talks given by a post-doc or a graduate student. However, this year, the Director of Vanderbilt's Graduate Program in Development was so impressed with Ellen's presentation that they created a special award.

**Tina Dao BMB '15** is participating in the 2013 Undergraduate Research Fellowship (URF) Program presented by the American Society for Microbiology (ASM).



Tina is conducting research with Michael Johnson, Ph.D. and Jason Rosch, Ph.D. in the Infectious Diseases Department of St. Jude Children's Research Hospital.

#### New Phi Beta Kappa members:

**Wenbin Du BMB '13, Jordan Perchik '13, Madeline Scott NEUR '13, Mary DuBose ENVS '14, Jake Magness ENVS '14, Elizabeth Bigus NEUR'14.**

#### New Omicron Delta Kappa honor society members:

**Noah Brown BMB'14, Shawnecca Burke BMB'14, Allison Cowling NEUR '14, Mary DuBose ENVS '14, Allie Elozory BMB'13, Matt Grisham '13, Stephen Leavelle '14, Jake Magness ENVS '14, Alix Matthews ENVS'14, John Menz '14, Monique Smyth BMB'13, Becky Thompson '13, Alex Yu '13.**

#### New Mortar Board Honor Society members:

**Stephen Leavelle '14, John Menz '14, Shawnecca Burke BMB '14 Allison Cowling NEUR '14, Jake Magness ENVS '14.**

Students whose research presentations received awards at the Tennessee Academy of Sciences western regional meeting (see page 3).

## Grants & Fellowships

**Jonathan Fitz Gerald.** 2103. RUI-Identification of genes and cellular processes targeted by imprinted pathways in natural variants of *Arabidopsis thaliana*. National Science Foundation. \$412,515.

**C.Shepherd Sarah Boyle, and Rachel Jabaily.** 2013. Arboreal landscape management at the Memphis Zoo using GIS analyses. Conservation Action Network grant, \$3,782.

**Michael Collins.** 2013. Training grant, Malaria Research Coordination Network, \$5,120 and Conservation and research grant, Tennessee Ornithological Society, \$2,200.

**Jonathan Fitz Gerald and Rachel Jabaily.** 2013. Improvement and

further integration of the curriculum of the Plant Genetics and Diversity course. Rhodes College Hill Fund.

## Publications

*Be sure to send us copies of your publications when they appear. Thanks!*

**Kabelik D, Alix VC, Burford ER '10, Singh LJ.** 2013. Aggression- and sex-induced neural activity across vasotocin populations in the brown anole. *Hormones and Behavior.* 63:437-446.

Weiss SL, Mulligan EE, Wilson DS, **Kabelik D.** 2013. Effect of stress on female-specific ornamentation. *Journal of Experimental Biology.* 216:2641-2647.

**Jaslow CR,** Kutteh WH. 2013. Effect of prior birth and miscarriage frequency on the prevalence of acquired and congenital uterine anomalies in women with recurrent miscarriage: a cross-sectional study. *Fertility and Sterility.* 99:1916-22.

**Boyle SA,** Smith AT, Spironello WR, Zartman CE. 2013. The behavioural ecology of bearded sakis (*Chiropotes satanas chiropotes*) living in forest fragments of Central Brazilian Amazonia. In *Evolutionary Biology and Conservation of Titis, Sakis and Uacaris.* Veiga L, Barnett A, Ferrari S, Norconk M (eds), Cambridge University Press: Cambridge, UK, pp. 255-261.

Ferrari S, **Boyle S,** Marsh L, Port-Carvalho M, Santos R, Silva S, Vieira T, Vié JC, Veiga L. 2013. The challenge of living in fragments. In *Evolutionary Biology and Conservation of Titis, Sakis and Uacaris.* Veiga L, Barnett A, Ferrari S, Norconk M (eds), Cambridge University Press: Cambridge, UK, pp. 350-358.

Johnson KM, González ML, Dueñas L, Gamero M, **Luque LE,** and Caniza MA. 2013. Improving waste segregation while reducing costs in a tertiary-care hospital in a lower-middle-income country in Central America. *Waste Management.* 31:733-8.

Parsons MJ, McCormick L, Janke L, **Howard A,'15,** Bouchier-Hayes L, Green DR. 2013. Genetic deletion of caspase-2 accelerates MMTV/c-neu-driven mammary carcinogenesis in mice. *Cell Death and Differentiation.* 20:1174-82.

## Meetings

*Be sure to send us information on your meetings when you go to one. Thanks!*

**Kabelik D; Johnson A, NEUR'15; Elbaum C, NEUR'14; Choudhury S, NEUR'15; Carroll P, NEUR'13; Scott M, NEUR'13;** Alix V. Poster presentation: The catecholaminergic system and social behaviors in the brown anole. The 16th Annual Meeting of the Society for Behavioral Neuroendocrinology. Atlanta, GA. June 23-26, 2013.

**Badami SM '14; Blustein EC '14;** Bystrak D; Relyea GE; **Collins MD.** Poster presentation: Changes in avian body sizes in response to climate change. American Ornithologists' Union Meeting. Chicago, IL. August 13-17, 2013.

**Boyle SA.** Symposium presentation: Pitheciid behavior and ecology in disturbed habitats: past trends and future prospects. American Society for Primatologists Meeting. San Juan, Puerto Rico. June 19-22, 2013.

**Boyle SA.** Biodiversity workshop presentation: GIS e imágenes satelitales para la investigación de biodiversidad. Jornada de Mastozoología del Paraguay Meeting. Asuncion, Paraguay. August 1-3, 2013.

**Johnson, EA '14;** Sheperd KA; **Jabaily RS.** Poster Presentation: Phylogenetic analysis and species delimitation of *Anthotium* (Goodeniaceae), a charismatic clade of Australian wildflowers. Botanical Society of America Conference. New Orleans, LA. July 26-Aug 1, 2013.

**Dahl E, BMB '14; Altamirano D '12; FitzGerald J.** Oral Presentation: Natural variation in *Arabidopsis atfh5* expression indicates an adaptive role for Polycomb regulation of the seed

endosperm. Developmental Biology Society Southeast Regional Meeting. Nashville, TN. May 13-15, 2013.

**Le P, BMB '15; Fitz Gerald J.** Poster Presentation: Characterization of the interaction between plant formin *AtFH5* and the small GTPase *ROP2*. Developmental Biology Society Southeast Regional Meeting. Nashville, TN. May 13-15, 2013.

**Luque de Johnson L;** Johnson KM; Gonzalez M; Caniza M. Poster presentation: Healthcare waste management at three pediatric hospitals in Central America: lessons learned. Environmental Health Meeting. Boston, MA. March 3-6, 2013.

**Luque de Johnson L.** Oral presentation: Cytoskeletal rearrangement in human red blood cells induced by the *Plasmodium falciparum* protein. The 88th Annual Meeting of the American Society of Parasitologists. Quebec City, Quebec, Canada. June 26-29, 2013.

**Fitz Gerald J.** Oral presentation: Applying inquiry-based strategies to reinforce integration of disciplines in an evo-devo course. Developmental Biology Society Southeast Regional Meeting. Nashville, TN. May 13-15, 2013.

**Jabaily RS.** Oral presentation: Bridging the gap between systematics and *Arabidopsis*-teaching integrative plant biology in a liberal arts setting. Botanical Society of America Conference. New Orleans, LA. July 26-Aug 1, 2013.

Student research presentations at the **Tennessee Academy of Sciences Western Regional Meeting.** Memphis, TN. April 6, 2013

#### Oral presentations:

**Julien A, NEUR '14; Roberts M, NEUR '14; Boyle S.** Aggression, altruism, and sexual behavior in the captive vampire bat (*Desmodus rotundus*) at the Memphis Zoo. 1st place.

**Blake M, '14; Leavelle S, '14; Marshall J, ENVS '14; Pope B, '13; Boyle S;** Roberts B; Smith A; Hadicke A; Falcone F; Knott K; Kouba A. Assessment of



#### Additional Courses for Biology majors

There are several interesting Biology courses for you to choose among for next semester. In addition, the Chemistry department is offering two spring sections of **Biochemistry (CHEM 414)**, and Dr. Jackson-Hayes will offer a section of **Mechanisms of Drug Action (CHEM 416)**. At least one section of **Neuroscience (NEUR 270)** will also be taught this spring. If you decide to take one of these courses from outside the Biology Department, please remember that not more than two may be used to fulfill the six upper-level courses required for the Biology major.

#### Animal Physiology and Neuroendocrinology

Due to the high demand for **BIOL375**, **Dr. Kabelik** will offer another section of Neuroendocrinology this spring. **BIOL375** will then be taught again at its regular time in fall 2014. For the foreseeable future, **BIOL340 Animal Physiology** will remain on offer during spring semesters.

#### Senior Seminar News

The spring Biology senior seminars are **BIOL 486-1: Malaria. Tu,Th 3:45-5:00** taught by **Dr. Laura Luque de Johnson**, and **BIOL 486-2: How Organisms Respond to Change. MWF 11:00- 11:50**, taught by **Dr. Sarah Boyle**. Students who signed up for one of these seminars during the lottery last spring should list it on their tree under "Other Courses" when they preregister this fall.

**Juniors note** that senior seminars for the '14-'15 academic year will be listed in the spring issue of the **BIOFEEDBACK**,

along with the date and time of the lottery through which you will select your seminar.

#### An International Experience in Health Care: Improving Infection Prevention and Control in Nicaragua



We are ready to go again! In the summer of 2012 Rhodes students **Jayme Alexander, Lindsey Bierle, Kevin Chien, Jonathan Fisher, Sarah Kennedy, Christopher Sloan, Peter Ward, and Virginia Whitman** traveled to Nicaragua with Dr. Luque de Johnson to join an existing program headed by St. Jude Children's Research Hospital to inform personnel in Latin America hospitals on current policies on infection prevention and control. The students stayed in Managua, Nicaragua for two weeks and immersed in the everyday procedures of surgical equipment sterilization, blood collection and learn about how hospital environmental hygiene. The students provided the local hospital with realistic solutions on how to reduce hospital acquired infections. This program is offered every other summer. Our next trip will be in the summer of 2014. Be on the lookout for the information session in October.

**Course # Bio 160, 2 credits, fulfills F11**

## Rocky Mountain Ecology Maymasters and Internships

Are you interested in spending June studying and gaining ecological field experience in Grand Teton and Yellowstone National Parks? If so, check out the Rocky Mountain Ecology Maymasters. Students may choose one of two courses: **ENVS 160 Rocky Mountain Ecology** (two credits, F11) or **ENVS 170 Rocky Mountain Ecology Field Research** (four credits, F7 and F11). Both courses are appropriate for Biology majors, as well as non-majors. The application deadline is February 15, but applications will be considered on a rolling basis. If you would like to be considered for financial aid, the deadline is December 1st. There will also be opportunities for students to apply for paid internships at Teton Science Schools. Please contact Dr. Boyle for more information on either the Maymasters or the paid internship positions.

## Meetings

*Continued from page 3*

flooring changes on African elephant behavior. 3rd place.

### Poster presentations:

**Matthews A '14; Boyle S.** Loggerhead shrikes (*Lanius ludovicianus*): GIS analysis of population decline across Arkansas. 1st place.

**Jones K '13; Lyons P '13; Boyle S;** Kouba A. Pack hierarchy of captive wolves utilizing behavior and spatial analysis. 2nd place.

**Hotard M '14;** Salinas YG; Connelly M; Ling T; Rivas F. Terrestrial natural products: a promising avenue for anti-malarial therapeutic agents. 3rd place.

**Marullo M, '13; Moore R, ENVS '14; Boyle S.** The extent to which shows influence behavior of California sea lions (*Zalophus californianus*).

**Phelps A, '15; Boyle S;** Bankston J; Horton C. Aggressive and mating interactions of giraffe (*Giraffa camelopardalis*) at the Memphis Zoo.

**Wang X, BMB '13; Hill T;** Jackson-Hayes L. The role of newly identified *Aspergillus nidulans* myosins in cytokinesis.



FRAZIER JELKE SCIENCE CENTER

# Optimal Foraging

The following courses will be offered  
next semester

Number	Course Title	Hours Offered
140	Biology II 3 Sections	MWF 8:00-8:50, 9:00-9:50 or TuTh 8:00-9:15
141	Biology II Lab 7 Sections	Tu 12:30-3:30, 4:00-7:00; W 1:00-4:00; Th 12:30-3:30
200	Evolution (Gardner & Jabaily)	TuTh 11:00-12:15, W lab 1:00-4:00
201	Mycology (Hill)	TuTh 9:30-10:45, Tu lab 12:30-3:30
220	Parasitology (Luque de Johnson)	MWF 10:00-10:50
301	Microbiology (Doherty)	MWF 8:00-8:50, W lab 1:00-4:00
304	Genetics (Miller)	TuTh 9:30-10:45, Tu lab 12:30-3:30
325	Molecular Biology (Lindquenter)	MWF 10:00-10:50, Th lab 1:00-4:00
340	Animal Physiology (Kabelik)	MWF 9:00-9:50, M lab 1:00-5:00
375	Neuroendocrinology (Kabelik)	MWF 11:00-11:50
380	Topics in Biomedical Science (Lindquenter)	TuTh 8:00-9:15
CHEM 414*	Biochemistry (Loprete)	MWF 11:00-11:50 and 12:00-12:50
CHEM 416*	Mechanisms of Drug Actions (Jackson-Hayes)	TuTh 9:30-10:45
NEUR 270*	Neuroscience (Klatzkin)	MWF 10:00-10:50
INTD 225†	Geographic Information System (Boyle)	Tu,Th 9:30-10:45

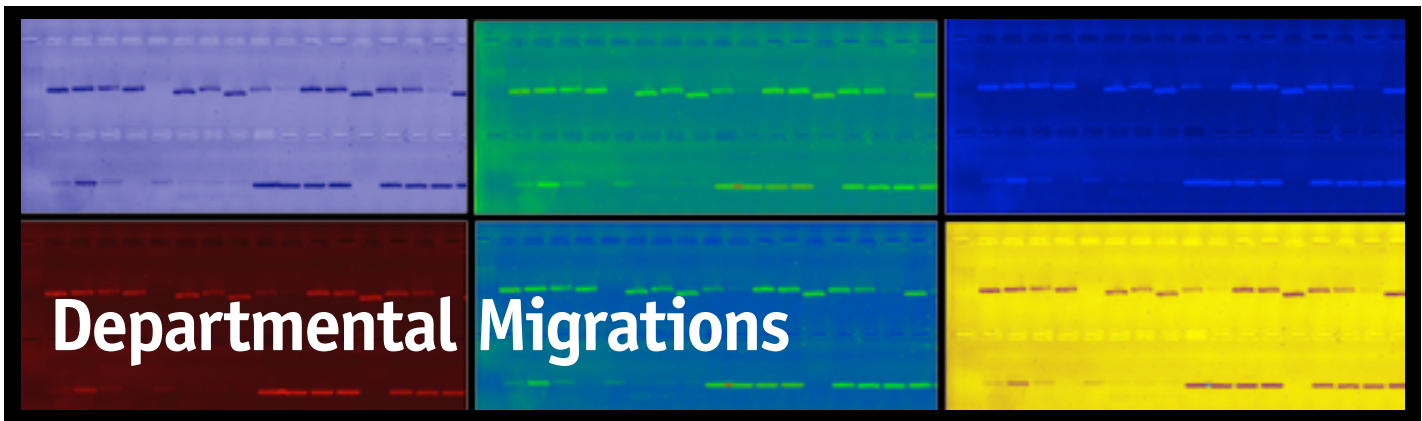
### Senior Seminar Sections

486-01	Malaria (Luque de Johnson)	TuTh 3:45-5:00
486-02	How Organisms Respond to Change (Boyle)	MWF 11:00-11:50

### Courses for non-majors (fulfills the F7 requirement)

105	The Biology of Infectious Diseases (Sturm)	MWF 11:00-11:50, M & W lab 1:00-4:00
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\* No more than two courses taken outside the Biology Department may count for the six upper-level courses required for the Biology Major.  
† GIS does not count as an upper-level course for the Biology Major.



## Welcome to Our Newest Department Members

**Dr. Mary Doherty** is a new Assistant Professor in Biology. She fell in love with marine ecology as a biology major at Smith College, in Northampton, MA, and took every field-based course she



could find. Dr. Doherty's Ph.D. work at the University of Massachusetts used molecular tools to study marine ciliates. These are protists - a large and diverse group

of organisms that are not well studied and are difficult to classify. After earning her degree, Dr. Doherty spent two years doing research on estuarine microbial communities at the University of Georgia Marine Institute on Sapelo Island – a pristine island with a population of 60 people!

For the last three years, Dr. Doherty has studied aquatic microbial communities from the Chesapeake Bay to the Amazon River and the Arctic Ocean. Dr. Doherty is very excited to be at Rhodes, and is teaching Environmental Science this fall and Microbiology in the spring. She is really enjoying living in Memphis, and all it has to offer, and will be exploring the local ecosystems more extensively as she settles in.

**Dr. Andy Gardner** joins Rhodes Biology as a postdoctoral fellow with Dr. Rachel Jabaily's lab. Dr. Gardner is a cheesehead; he grew up in Green Bay, WI and attended the University of Wisconsin-Madison for both his undergraduate degree and his PhD.



For his PhD, Dr. Gardner studied the history of the 60 million year old plant genus *Oxalis* using molecular phylogenies to reconstruct morphological,

niche, and geographic evolutionary transitions. His research incorporates DNA sequence data, morphological data from museum specimens and live plants, and environmental niche modeling. At Rhodes, Dr. Gardner has switched his research from Neotropical *Oxalis* to the Paleotropical Goodeniaceae. This Australian plant family contains a wide array of flower morphologies, with some species even mimicking the flowers of different genera! Dr. Gardner is also teaching a senior seminar on biogeography and is very excited to be teaching his first seminar-style course in a subject he loves.

Dr. Gardner has settled in Midtown with his wife, Sasha, and their cat, Finn. They are eagerly exploring all that Memphis has to offer and look forward to life in the Mid-South.

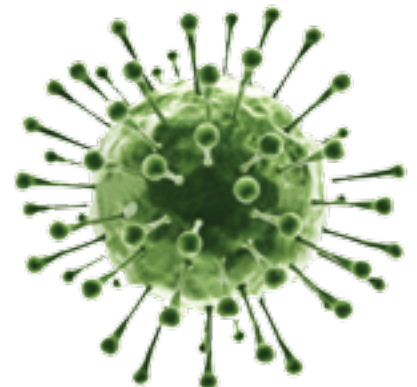
**Ms. Karen Mogonye** has joined the Biology group as the new Departmental Assistant. She is a new employee to Rhodes, but not new on campus. Karen has worked in 3 other departments on campus besides the Biology department as a temporary employee for the past year. She has worked in many different industries, but this is the first time in education.



In her spare time, she likes to spend time with her fiancé Michael, her only child Keidrah and her 3 grandchildren, Cayden, Grace and Sydney.

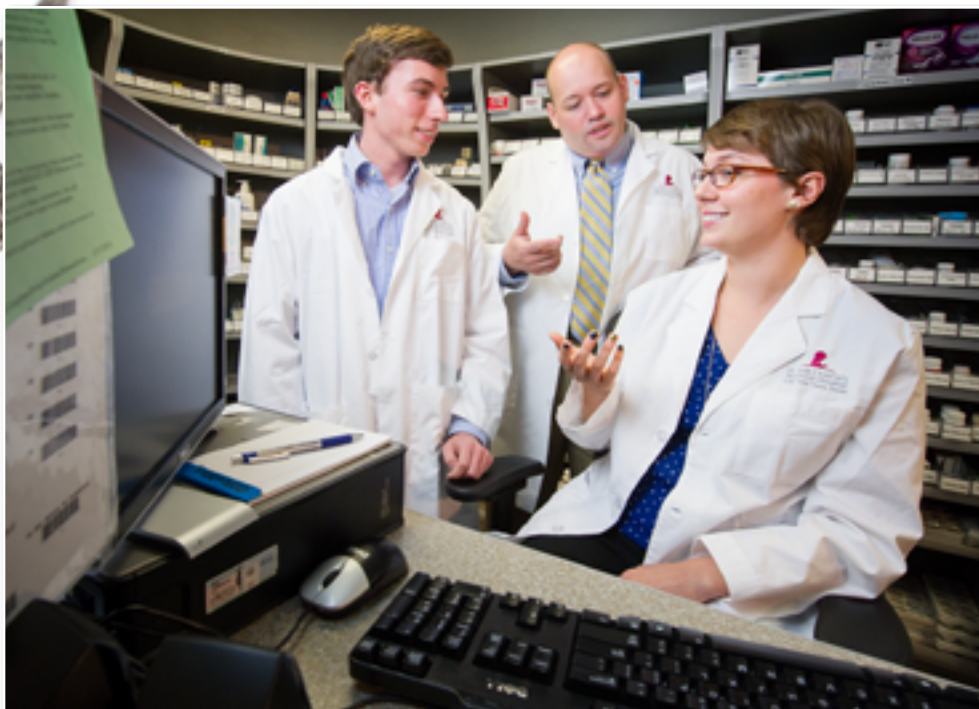
She also enjoys Bunco, scrapbooking, and visiting with friends.

"I know that I am very lucky to be at Rhodes and really enjoy everyone here". Please stop by the office sometime to introduce yourself and to welcome Ms. Mogonye.



# Signals & Displays

## Short Communications



(l-r) *Matthew Cannavo, James Hoffman, PharmD of St. Jude, and Sierra Thompson in Promise, Summer 2013.*

### Students Make Global Impact in Rhodes-St. Jude International Summer Plus Program

For the past four years, students in the Rhodes-St. Jude International Summer Plus Program have spent their summers conducting clinical research and shadowing pharmacists and physicians at Calvo Mackenna Children's Hospital in Santiago, Chile. The students then perform clinical research with mentors during the ensuing academic year.

**Matthew Cannavo NEUR '15** and **Sierra Thompson '15** are featured in the current issue of *Promise*, a publication of St. Jude Children's Research Hospital, about their experiences. (See <http://www.stjude.org/promise>)

Also participating in the program this summer was **Sarah Laves BMB'15**. Many past participants are now in medical school.

### New Biology Course Provides a Model for Collaboration

Based on their development of the new Plant Genetics and Diversity (PG&D) course, Drs. Fitz Gerald and Jabaily were both invited this summer to present their innovative approach to interdisciplinary education in the Biological Sciences to their respective colleagues. PG&D was introduced as a new model for bridging biology and computation in undergraduate and graduate education. It was also presented as a way to

encourage collaboration between disciplines of biology that typically do not work together and as a means to facilitate discussion between professors from multiple primarily undergraduate institutions.

### 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. May it be noted 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  $\beta\beta\beta$  president, Kristen Wendt ([wenke@rhodes.edu](mailto:wenke@rhodes.edu))



or vice president, Maggie Klusman (klums@rhodes.edu).

Go to [www.rhodes.edu/biology/22139.asp](http://www.rhodes.edu/biology/22139.asp) for detailed membership criteria.

Tri-Beta has some exciting service projects planned for the fall. One such ongoing project entails hosting monthly meetings with the Springdale Elementary School's Science Club. We also had a Rose Garden Clean-Up Day with the intention to provide an inviting space for biology students and faculty. Finally, we will be volunteering at Springdale Science Saturday events. One of those was held September 21st at the Memphis Botanical garden and another will be coming on November 23rd at Agricenter International. 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 Stephen Leavelle (lease@rhodes.edu) with your size and Rhodes Box number. Finally, we inducted new members on Tuesday October 8th. We are excited to welcome those 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 during the school year, as well as commentaries and reviews of biological topics. If you haven't written a paper recently, think about helping out with the journal! Please contact Liz Karolczuk (karem@rhodes.edu) if you are interested in submitting a paper or working with the journal.

### \$\$ 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 his or her name

## Upcoming Seminars

### Biology Seminar Series

#### Breaking Chromatin to Understand it: A Genetic approach provides new insights into the transcription Elongation Process.

Dr. Andrea Duina, Associate Professor of Biology, Hendrix College

When: **Monday, October 23, 2013**

Time: **4:15 pm**

Where: **Frazier Jelke B**

Refreshments: 4:00 pm

### Cutting Edge St. Jude Research Seminar Series

#### How Minichromosome Maintenance Protein (MCM) Helicases Bind DNA

Clifford Froelich, PhD, Department of Structural Biology

When: **Thursday, October 17, 2013**

Time: **4:00 pm**

Where: **Frazier Jelke B**

Refreshments: 3:45 pm

#### New Insights into Influenza A Virus Entry

Husni Elbahesh, PhD, Department of Infectious Diseases

When: **Thursday, November 7, 2013**

Time: **4:00 pm**

Where: **Frazier Jelke B**

Refreshments: 3:45 pm

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.



### Tri-Beta Rose Garden Clean-up Crew

*Alex DeGenova*

*Kristen Wendt*

*Rachel Jabaily*

*Stephen Leavelle*

*Mr. & Mrs. Leavelle*

*John Menz*

*Autumn Demonbreum*

*Kira Reich*

# Student Presentations given in April 2013 at Rhodes's Undergraduate Research and Creative Activity Symposium

**Cahill A '14, Grisham M '13.** Avian health and parasite incidence in an urbanized landscape. (Laura Luque de Johnson).

**Croft A '14.** Breast Tumor Kinase (BrK/PTK6) and HIF-1a are co-expressed in human triple negative breast tumors. (Gary Lindquenter).

**Dahl E, BMB '14.** Natural variation in *Arabidopsis atfh5* expression indicates an adaptive role for Polycomb regulation of the seed endosperm. (Jonathan FitzGerald).

**Elbaum C, NEURO '14, Carroll P, NEURO '13, Choudhury S, NEURO '15, Johnson A, NEURO '15.** Immunocytochemical localization of catecholamine activity in the brain after social interactions. (David Kabelik).

**Huerta T '15,** Cline T, Schultz-Cherry S. Characterizing the interferon response of gastrointestinal epithelial cells to human astrovirus infection. (Gary Lindquenter).

**Infield J, BMB '14,** Patel A, Patel C. Evaluation of the Simplexa Flu A/B & RSV Direct Assay™, Prodesa Proflue+™ Indirect Assay, and Rapid Influenza Antigen Test for detection of influenza and RSV. (Laura Luque de Johnson).

**Johnson E '14.** Phylogenetics and species delimitation of the southwest Australian endemic wildflower genus *Anthotium* (Goodeniaceae). (Rachel Jabaily).



**Julien A, NEURO '14, Roberts M, NEURO '14, Boyle S.** Aggression, altruism, and sexual behavior in the captive vampire bat (*Desmodus rotundus*) at the Memphis Zoo. (Sarah Boyle).

**Le P, BMB '15.** Characterization of the interaction between plant formin *AtFH5* and the small GTPase ROP2. (Jonathan FitzGerald).

**Leavelle S '14, Blake M '14, Marshall J, ENVS '14, Pope B '13, Boyle, S,** Roberts B, Smith A, Hadicke A, Falcone F, Knott K, Kouba A. Memphis Zoological Society assessment of flooring changes on African elephant behavior. (Sarah Boyle).

**Lyons P '13, Jones K '13,** Boyle S and Kouba A. Pack hierarchy of captive wolves utilizing behavior and spatial analysis. (Sarah Boyle).

**Marullo M '13.** The effect of increasing sea surface temperature on the intensity of coral bleaching events. (Sarah Boyle).

**Marullo M '13, Moore R, ENVS '14.** Behavioral observations of social interactions between Nile hippopotamuses (*Hippopotamus amphibius*) in captivity. (Sarah Boyle).

**Matthew A, ENVS '14.** Loggerhead shrikes (*Lanius ludovicianus*): GIS analysis of population decline across Arkansas. (Sarah Boyle).

**Moore R, ENVS '14, Marullo M '13.** The extent to which shows influence behavior of California sea lions. (Sarah Boyle).

**Phelps A '15.** Social dynamics of a giraffe family. (Sarah Boyle).

**Pyda P, ENVS '14 Fenzel K.** The prevalence of *Gambierdiscus sp.* in the Caribbean Sea. (Sarah Boyle).

**Robinson K, BMB '15,** Ramsey L, Relling M. Pharmacokinetics of dexamethasone in mice and with acute lymphoblastic leukemia. (Mary Miller).

**Yu A '13, Khan A '13, Hayward E '16.** Morphological and molecular characterization of *Hepatozoon* spp. from naturally infected snakes in Overton Park. (Laura Luque de Johnson).

