



BIOFEEDBACK

THE NEWSLETTER OF THE BIOLOGY DEPARTMENT AT RHODES

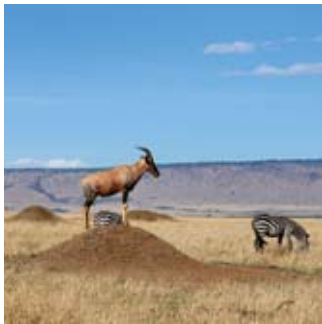
Volume 25

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Number 2

The purpose of *BIOFEEDBACK* is to provide an important and timely vehicle for the dissemination of information concerning BOTH faculty and students of the Biology Department. Any notices or information that you wish to include in *BIOFEEDBACK* should be submitted to either Dr. Carolyn or Dr. Alan Jaslow. *BIOFEEDBACK* is published each semester.

The Chair's Niche



Most would agree that the centerpiece of the Department of Biology is the pentaceratops. We've even adopted the term Dino Lounge for its surroundings. Whatever prospective students and faculty candidates remember about Rhodes, the dinosaur has to top the list.

Yet the dinosaur is only one of many items on display.

Our displays include an electron microscope; a DNA double-helix, antique books and anatomical drawings; a Brazilian pink tarantula; corals; skeletons; orchids; freshwater and marine fish; mangroves; a sculpture in memorial to a former professor; a piece of wood excavated by carpenter bees; remnants of a mastodon unearthed during construction of this building; and some of your own research posters.

Over the coming months, you will see new items going on display as well. We hope these displays provide some interesting diversion as you fill time between classes or lab procedures.

Dr. Gary Lindquester

There is more to biology than rats, Drosophila, Caenorhabditis, and E. coli.

— Ernst Mayr

Primary Productivity and Secondary Growth



The following is a list of honors, awards, publications and meeting participation of our faculty and students since October 19, 2010.

Honors and Awards Congratulations to...

... **Dr. Sarah Boyle** who was elected board member and co-chair of Education for the Memphis Area Geographic Information Council.

... to the new (βββ) officers: **Cintara Bradley NEUR '12** (treasurer) and **Madeline Jeansonne '12** (secretary).



Grants and Fellowships

Dr. Rosanna Cappellato, Dr. Michael Collins, Dr. Jonathan Fitz Gerald, Dr. David Kabelik and Dr. Laura Luque de Johnson were awarded Faculty Development Endowment Grants for this coming summer.

Dr. Cappellato's project, "Ecosystem analysis of Memphis urban parks as a tool to promote the conservation of Memphis green spaces;" Dr. Collins' "The effects of urban noise on bird song;" Dr. Fitz Gerald's "Using natural variation in the plant *Arabidopsis thaliana* to identify primary developmental outcomes of parental genomic imprinting;" Dr. Kabelik's "How a single neurotransmitter can cause opposing behavioral outcomes" and Dr. Luque de Johnson's "Visualization of cytoskeletal rearrangement in live red blood cells after interactions with the parasitic protein EBA-175 using confocal microscopy" were part of a highly competitive process in which there are nearly two proposals for each available award.

Ted Boozalis '12, Landon LaSalle '12, and Anna Johnson '11 each received financial support to attend the Society for Integrative and Comparative Biology meeting in Salt Lake City, Utah, from the Rhodes Student Travel Fund and the Society for Integrative and Comparative Biology Charlotte Magnum Student Travel Award.

John Geyer '13 was funded through the Rhodes Fellowship

Program to work with **Dr. Jen Houghton**. His project, "History of geology using the Rhodes Vanuxem Collection" may be viewed at <http://earthsciweb.org/vanuxem/>.

The **Ghost River Brewery Microbiology Internship** was accepted as a Rhodes Fellowship for the spring semester. **Drs. Laura Luque de Johnson** and **Terry Hill**, in conjunction with the local microbrewery, designed this fellowship to expose students to how biological knowledge and skills are employed in an industrial environment. **Catherine Bordelon '12** was selected to perform microbiological quality control over different stages of the beer-brewing process.



Publications

Laurance, W. F., J. L. Camargo, R. C. C. Luizão, S. G. Laurance, S. L. Pimm, E. M. Bruna, P. C.

Stouffer, G. B. Williamson, J. Benítez-Malvido, H. L. Vasconcelos, K. S. Van Houtan, C. E. Zartman, **S. A. Boyle**, R. K. Didham, A. Andrade, and T. E. Lovejoy. 2011. The fate of Amazonian forest fragments: a 32-year investigation. *Biological Conservation* 144: 56-67.

Stahlschmidt, Z., **J. R. Davis**, and D. F. DeNardo. 2011. Sexual variation in assimilation efficiency: Its link to phenotype and potential role in sexual dimorphism. *Journal of Comparative Physiology*

B DOI : 10.1007/s00360-010-0536-0.

Foustoukos, D. I., **J. L. Houghton**, W. E. Seyfried, Jr., S. Sievert, G. D. Cody. 2011. Kinetics of H₂O₂-H₂O redox equilibria and formation of metastable H₂O₂ under low temperature hydrothermal conditions. *Geochimica et Cosmochimica Acta* 75: 1594-1607.

Houghton, J. L. and W. E. Seyfried, Jr. (2010) An experimental and theoretical approach to determining linkages between geochemical variability and microbial biodiversity in seafloor hydrothermal chimneys. *Geobiology* 8: 457-470.



Meetings

Twelve Rhodes students participated in the 10th Annual Mid-South GIS Conference, November 18-19, 2010 in Germantown, TN.

The following five posters were presented: "Human-elephant conflict in Namibia" by **Adam Alsamadisi '12** and **Blaire O'Neal '12**, first place; "Changes in undeveloped land acreage along the Wolf River" by **Lee Bryant '11** and **Jared Swenson '12**, third place; "The effects of headcutting on Wolf River channelization and adjacent wetlands" by **David Siu '12**; "Remote sensing of land cover in succession areas" by **Brad Hensley '12**; and "Effects of land cover on parasite prevalence in snakes" by **Adiha Khan '13**,

Kimber Jones '13, **Matthew McCravy BMB '12**, **Matt Grisham '13**, and **Anna Johnson '11**, with **Drs. Davis, Luque de Johnson**, and **Boyle**.

Two additional research talks were given at the conference. Rebecca Vandewalle '12 presented "Visualizing archaeological data using Google Earth and GIS" which was coauthored by **Drs. Moreland and Boyle**, and **Dr. Boyle** presented "GIS and remote sensing: resources for improving community participation."

In January, **Dr. Jon Davis** attended the Society for Integrative and Comparative Biology meeting in Salt Lake City, Utah with **Ted Boozalis '12**, **Landon LaSalle '12**, and Rhodes Fellow, **Anna Johnson '11**. Ted presented a talk titled, "Good as new? Morphological and biochemical analyses reveal variation between original and regenerated lizard tails," co-authored by Landon LaSalle and Dr. Davis. Landon presented a poster on a parallel project titled, "Adding insult to injury: Primary and secondary costs of tail loss in lizards", with co-authors **Ted Boozalis**, **Julia Goss '10**, and Dr. Davis. Anna presented a poster entitled, "An integrative assessment of snake parasitism across an urban-rural gradient", coauthored and Rhodes Fellows **Matt Grisham '13** and **Adiha Khan '13**, as well as **Kimber Jones '13**, **Matt McCravy '13**, and **Drs. Sarah Boyle, Laura Luque de Johnson**, and **Davis**.

Curricular Evolution

Faculty and Course Updates for '11-'12



Staffing News for 2011-2012

Next year, Dr. Terry Hill will be on sabbatical for the entire year. We will continue to offer Cell Biology in the fall, and the Biology Department is looking now for someone to teach the course. We also hope to have a new Plant Evolutionary Biologist on staff, and so we anticipate that we will be offering Evolution in the spring for the first time in a couple of years.

Wrap Your Brain Around This!

Starting next year, Dr. Kabelik's spring Neuroscience course (BIO 370) will no longer be offered. Instead, Dr. Kabelik

will teach **Neuroendocrinology (BIO 375)** in the spring. Neuroendocrinology explores how the brain regulates endocrine homeostasis

and how changes in hormone levels affect neural structure and function, including regulation of stress, appetite and various social behaviors.

Neuroendocrinology will not have a lab component.

ES Course Tectonics

Environmental Hydrogeology (GEO 214) will be offered in the fall rather than the spring, and **Physical Geology (Geo 111)** will be offered in the spring and will focus on National Parks as case studies, thereby flipping the order from this year. Also a new 1-credit (F11) field excursion to the Teton Science School in Grand Teton National Park will be offered from August 7-14 called **Introduction to Environmental Field Methods: Hydrogeology in the Greater Yellowstone Ecosystem**. The field excursion, offered through Study Abroad, can be taken as a single experience, although students are encouraged to consider taking it in conjunction with the fall semester Environmental Hydrogeology course, which will incorporate datasets collected during the trip.

Other Courses that Count for the Bio Major

If you are looking for an additional course to fulfill upper-level Biology requirements in the Fall, don't forget about **Biochemistry (CHEM 414)** which requires Organic Chemistry (CHEM 212) as a prerequisite. **Pharmacology (CHEM 416)**, usually taught in the fall, will be taught Spring '12. It also requires Organic Chemistry as a prerequisite.

Comparative Vertebrate Morphology (BIO 350)

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 PM. CVM has two course numbers. The first includes the lecture and Tuesday lab.



Optimal Foraging

The following courses will be offered next semester

Number	Course Title	Hours Offered
130	Biology I Lecture	MWF 8-8:50, 9-9:50 or 11-11:50, TuTh 9:30-10:45 4 Sections
131	Biology I Lab	Tu 12:30-3:30, Wed 1-4, or Th 12:30-3:30 6 Sections
207	Animal Behavior (Boyle)	MWF 10-10:50, Mon lab 1-4
307	Cell Biology (TBA)	TuTh 8-9:15
BCMB 310	Methods in Cell Bio/Bioch (Loprete)	W 1:00- 5:00
315	Ecology (Collins)	TuTh 9:30-10:45, Th lab 12:30-3:30
330	Virology/Immunology (Lindquenter)	MWF 10-10:50
340	Animal Physiology (Kabelik)	MWF 9-9:50, Tu lab 12:30-5
350	Comp Vert Morph (AJaslow)	MWF 9-9:50, Tu lab 12:30-3:30, Fri lab 1-3
360	Histology (CJaslow)	MWF 8-8:50, Wed lab 1-4
380	Topics in Biomedical Science (Lindquenter)	MW 7:30-8:45
CHEM 414	Biochemistry (Loprete)	MWF 11-11:50
Senior Seminar Sections		
485-1	The Mississippi River (Cappellato)	TuTh 3:45-5
485-2	Viruses: Risks and Benefits (Lindquenter)	TuTh 11-12:15
For Non-Majors		
120	Introduction to Environmental Science	MWF 11-11:50, Mon lab 1-4



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.

Where Does the Methods Lab (BCMB 310) Go on the Tree?

Methods in Cell Biology & Biochemistry (BCMB 310) is the optional laboratory section for Cell Biology (BIOL 307) and/or Biochemistry (CHEM 414). Students who intend to request BCMB 310 as a lab with either Cell or Biochemistry should enter it into the Lab portion of the tree. Students who wish to take the course alone, because they took or will take Cell or Biochemistry, cannot sign up for it on the tree. Instead, they should contact Dr. Loprete as soon as possible.

What's Up for Next Spring?

In the spring of 2012 we expect to offer the following upper-level Biology classes: Conservation Biology, Mechanisms of Development, Evolution, Genetics, Microbiology, Molecular Biology, Neuroendocrinology, and Parasitology. Also planned for spring are the three courses that include summer field trips: An International Experience in Health Care: Improving Infection Prevention and Control in El Salvador; Environmental Issues in South Africa; and Rocky Mountain Ecology. Bear in mind that this list of courses is tentative and could change if unexpected circumstances arise. In particular, the field courses will only be offered if they have adequate enrollments.

Senior Seminar Lottery

Wednesday, March 23rd

Next year, the Biology Department will offer three sections of Biology Senior Seminar. In addition, four Biology students may enroll in the BCMB Senior

Seminar that Dr. Miller will teach. Rising seniors, please consult the descriptions of these four senior seminar courses below.

All rising Biology seniors must reserve a slot in a fall or spring Biology senior seminar section, or BCMB senior seminar, via a lottery that will be held in the Biology Library at 11:00 AM on Wednesday, March 23rd. 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 before spring break.

Senior Seminar Choices '10-'11

BIOL 485-1: Dr. Rosanna Cappellato's fall senior seminar, "The Mississippi River," will meet on Tu/Th 3:45-5:00 and will focus on the ecology of the river. The course will cover basic concepts of river ecology and will investigate how human-driven changes, such as dams, artificial channeling, and exotic species have affected the ecosystem's



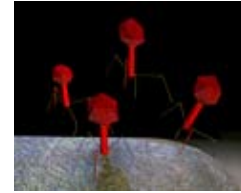
health. The Gulf of Mexico "dead zone" and the environmental impact of hur-

ricane Katrina will be among the topics addressed during the semester. Emphasis will be placed upon research from the primary literature selected, presented and discussed by students in the class.

Note: This seminar conflicts with the Animal Physiology lab. DO NOT sign up for this seminar if you want to take Animal Physiology.

BIOL 485-2: Meeting on Tu/Th 11:00-12:15, **Dr. Gary Lindquenter's** fall seminar is "Viruses: Risks and Benefits."

Over the centuries, viruses have posed great risks to humanity. Historically, viral diseases such as smallpox and influenza have decimated large portions of the



human population. In more recent times, viruses such as HIV and Ebola have threatened us. Yet, humans

have also harnessed viruses for their own benefit. Bacteriophage can treat bacterial infections, viruses can target invasive species in the environment, and viruses can deliver toxins to cancer cells or functional genes to tissues with genetic defects. This seminar will begin with an overview of viral structure and function and go on to explore such topics as highlighted here, selected by the participants from a broader list.

BIOL 486-1: Meeting in the spring on Tu/Th 4:00-5:15, **Dr. Michael Collins' "Avian Ecology"** seminar will cover a wide range of topics including urban ecology, migration, population and community

ecology, and conservation biology of birds. Students



will read and present background information from the primary literature. They will also research a topic of their own interest that relates to avian ecology, summarize their findings to the class, and evaluate the presentations of other students.

BCMB 486: Meeting in the spring on M/W/F 9:00-9:50, **Dr. Miller's "Cancer Biology"** will be accepting four biology majors to join the BMB major senior seminar. This seminar is required for all BMB majors. Biology students who are interested should have taken one or more of the following courses: Molecular Biology (BIOL

325), Biochemistry (CHEM 414), or Cell Biology (BIOL 307). This seminar will focus on the molecular basis of cancer and will integrate faculty from St. Jude Children's Research Hospital to present their research. Students will read and present background information and primary

literature on the topics to be covered by the St. Jude faculty. Biology majors who wish to take this seminar should contact Dr. C. Jaslow as soon as possible.



Alumni Luminescence

Does school have you totally stressed out? Are you questioning your post-graduate options? Does the thought of even more schooling seem like the straw that will break your camel's back? Well, you might want to consider a gap year. To gain some perspective on this ever more popular option, we spoke to some of our pre-med students who opted to take a gap year before applying to medical school. Keep reading to see what we found out.

Gustavo Huerta '10 finished college in three years and decided it would be better to "broaden his experiences with medicine" and become a more-well rounded applicant before applying to medical school. "By doing a summer research internship at St. Jude Children's Research Hospital through the Pediatric Oncology Education Program...and working as an Endoscopy Technician for a general surgeon" during the academic year, he's managed to do both.



GUSTAVO HUERTA '10

When asked if he would recommend this option to other students, Gustavo responded with a resounding yes, saying "It's a great way to take some time off from the constant studying and academic grind of school while also gaining valuable experiences and saving some cash. Don't be intimidated by the concept of not knowing what you will be doing that year or what graduate schools will think

of you for taking a year off. In almost every medical school interview I have had we have discussed my gap year. I have had several interviewers tell me what a good experience they think it is for prospective medical students."

Ciara Conway '10 also felt that it was important to take a break from the demands of academia. She welcomed the chance to "explore various medical schools to get a feel for which one would be the right fit." During her time off, Ciara told us "I have gotten the opportunity to travel abroad to Uganda and conduct research" through the MHIRT program at Christian Brothers University (see <http://www.cbu.edu/mhirt>).



CIARA CONWAY '10

Knowing the stressful commitment of medical school, Ciara said she was happy to have the year off getting time to "do things I enjoy such as community service, making new friends, and exploring new places before I commit myself

to school." Ciara works in New York City with an AmeriCorps affiliate program, the New York Intern Program. She helps provide support to South Asian immigrants living in the Bronx...to make sure that holistic health care is accessible to this community. She teaches ESL classes, writes grants, and trains community health workers to deliver health care messages to the community.

Ciara told us that "taking a year off can be a good decision depending on how you choose to spend it. Explore meaningful things that you can do with your time. At every medical school interview, I was asked about productive things I was doing with my time. Though the year off should be relaxing and insightful, do something that will provide interesting and stimulating discussions during your interviews."

So, take a deep breath. Start thinking outside the box. A gap year might be just what the doctor ordered!



Signals and Displays (short communications)

New Majors!

With a unanimous vote by the faculty, Rhodes College officially added two majors, a B.S. in Environmental Sciences and a B.A. in Environmental Studies, to the catalogue in February. These majors build on the existing minors in Environmental Sciences and Environmental Studies and

address an increasing interest among the students for these disciplines. The Departments of Biology and Chemistry will contribute to the B.S. in Environmental Sciences through course offerings and research opportunities. Drs. Boyle, Cappellato, and Collins in Biology, Drs. Loprete and Russ in Chemistry, and Dr. Houghton in Geosciences are eager to



share their expertise with Environmental students and look forward to building a dynamic, active program in Environmental Studies and Sciences at Rhodes. Questions about the program should be directed to Dr. Cappellato (cappellator@rhodes.edu). Information on the majors' requirements is posted on the Environmental Program website (<http://www.rhodes.edu/ess>).

TN Academy of Science Meetings

This year the Collegiate Division of the Tennessee Academy of Science will be hosted by the University of Tennessee Health Science Center on Saturday, April 9th. This meeting is an excellent opportunity to learn about the research of other undergraduates or to have your abstract published in the *Journal of the Tennessee Academy of Science* if you present (a great addition to your curriculum vitae). Registration and Abstracts are due by March 24th. Instructions are at <http://www.uthsc.edu/TAS/>.

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 sharing and dissemination of information 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. 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, Lindsey Bierle (biela@rhodes.edu) or vice president, Ted Boozalis (boots@rhodes.edu). Go to <http://www.rhodes.edu/academics/2981.asp> for detailed membership criteria.

\$\$ Biology Research Award \$\$

This spring, the Biology Department will be presenting the "**Award for Outstanding Student Research in Biology.**" Any student with a declared Biology Major and 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 Monday, March 28th. Copies of the application and recommendation forms may be obtained from Dr. Luque de Johnson. Announcement of the award winner will be made at spring awards convocation on Friday, April 29th.

Undergraduate Research and Creative Activities Symposium (URCAS)

The Rhodes Undergraduate Research and Creative Activities Symposium (URCAS) provides 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. It will take place on Friday, April 29th this year – keep your eyes open for a final schedule of paper/poster presentations.

Those wishing to present a paper or poster need to identify a faculty sponsor and must submit an abstract via the online submission process by March 23rd. Online submission will open well in advance of this deadline; you will receive notification when it is open.

Biology Seminar Series

There is still one remaining Seminar sponsored by the Biology Department this spring. Monday, April 4th, Dr. Richmond Thompson, Associate Professor of Psychology and Neuroscience and Director of the Neuroscience Program at Bowdoin College in Maine, will be our guest speaker. Dr. Thompson will present "The Evolution of Peptide Social Regulatory Mechanisms in Vertebrates." Be sure to mark the date!



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 someone who has an interest in Biology and has taken Bio I and II for the job. Pay and further details concerning being a TA will be discussed on an individual basis. 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 the fall/spring positions is April 27, 2011. Also, if you are interested in working in the Biology Department this summer, please contact Sarah Hasty.

Student Research 2010-2011 Sponsored by Programs at Rhodes (Rhodes faculty supervisors listed)

Veronica Alix '12 *Immuno-histochemical localization of neural activation following aggressive encounters.* BIO 452 (Dr. David Kabelik)

Jason Ballard '11 *Tract tracing of neural networks involved in the regulation of social behaviors.* BIO 451 & 452 (Dr. David Kabelik)

Logan Benoist '11 *The effects of urban noise on bird vocalizations.* BIO 452 (Dr. Michael Collins)

Maha Bano '13 *Characterization of curcumin and its derivatives as carboxylesterases inhibitors.* Dr. Phil Potter, St. Jude Summer Plus Program, BCMB 451 & 452 (Dr. Laura Luque de Johnson)

Ted Boozalis '12 *Biochemical and morphological exam of tail regeneration in lizards.* BIO 451 & 452 (Dr. Jon Davis)

Tiara Brice '11 *An analysis of mercury in soil.* BIO 452 (Dr. Rosanna Cappellato)

Nick Brydon '13 *Monitoring snow leopard reproductive hormone levels by ELISA.* Dr. Erin Willis, Memphis Zoo, BIO 451 & 452 (Dr. Gary Lindquester)

Nick Brydon '13 *Measuring cardioprotective properties of a novel anti-cancer drug in-vitro.* Dr. Judith Soberman, UTHSC, BIO 451 & 452 (Dr. Gary Lindquester)

Maria Cartagena '11 *Analysis of electronic medication records at St. Jude.* BIO 451 & 452 (Dr. Jonathon Fitzgerald)

Ryan Costello '12 *Generation of truncation mutations in the PkcA gene of *Aspergillus nidulans*.* BIO 451 & 452 (Drs. Terry Hill, Loretta Jackson-Hayes, Darlene Loprete)

Claire DelBove '11 *Generation of truncation mutations in the PkcA gene of *Aspergillus nidulans*.* CHEM 451 & 452 (Drs. Terry Hill, Loretta Jackson-Hayes, Darlene Loprete)

Allie Dillion '12 *The history of the Rhodes College Arboreta.* BIO 452 (Dr. Rosanna Cappellato)

Wenbin Du '13 *Identification of a mutation in the Myosin gene in*

**Aspergillus nidulans*.* BIO 451 & 452 (Drs. Terry Hill, Loretta Jackson-Hayes, Darlene Loprete)

Danielle Eastlack '11 **S. cerevisiae* ploidy specific sensitivity to the chemotherapeutic drug, KP1019.* Research Assistant (Dr. Mary Miller)

Allie Elozory '13 *Application of asparaginase activity assay to clinical pharmacokinetics of Elspar (*E. coli* asparaginase) in children with acute lymphoblastic leukemia* St. Jude Summer Plus Research with Dr. Mary Relling, Chair, Pharmaceutical Sciences, St. Jude, BIO 451 & 452 (Dr. Mary Miller)

Shannon Fuller '11 *Characterization of cytoskeletal rearrangement in red blood cells after interaction with Plasmodium protein EBA-175.* BIO 451 & 452. (Dr. Laura Luque de Johnson)

Katelyn Foster '11 *Characterization of cytoskeletal rearrangement in red blood cells after interaction with Plasmodium protein EBA-175.* BIO 451 & 452. (Dr. Laura Luque de Johnson)

Matt Grisham '13 *Parasitology of reptiles across an urban-rural gradient.* BIO 451 & 452 (Dr. Jon Davis)

Will Hawes '12 *Effects on aggression of pharmacological manipulation of the central vasotocin system.* BIO 452 (Dr. David Kabelik)

Henin, Sandy '11 *Understanding the hypoxic response in mouse models for breast cancer* with Dr. Tiffany Seagroves, UT Cancer Institute, BIO 451 & 452 (Dr. Gary Lindquester).

Rachel Hickey BMB '11 *Functional analysis of the SccA gene in *Aspergillus nidulans*.* BIO 451 & 452 (Drs. Terry Hill, Loretta Jackson-Hayes, Darlene Loprete)

Brianna Hoge '12 *Proteomic analysis of S-tagged and GFP-tagged PkcA in *Aspergillus nidulans*.* BIO 451 & 452 (Drs. Terry Hill, Loretta Jackson-Hayes, Darlene Loprete)

Anna Johnson '11 *Parasitology of reptiles across an urban-rural gradient.* BIO 451 & 452 (Dr. Jon Davis)

Kimber Jones '13 *The development of*

non-invasive reproductive hormone monitoring techniques for endangered Amur and snow leopards. Dr. Willis (Memphis Zoo), BIO 451 & 452 (Dr. Sarah Boyle)

Aaron Kala '12 *Effects on aggression of pharmacological manipulation of the central vasotocin system.* BIO 451 & 452 (Dr. David Kabelik)

Adiha Khan '13 *Molecular characterization of hemoparasites in local snakes.* BIO 451 & 452 (Dr. Laura Luque de Johnson)

Lydia Lancaster '11 *Characterization of cytoskeletal rearrangement in red blood cells after interaction with Plasmodium protein EBA-175.* BIO 451 & 452. (Dr. Laura Luque de Johnson)

Bethany Larkin '13 *Pre-clinical testing of the novel anthracycline AD 445 in human breast cancer cell lines.* Dr. Tiffany Seagroves & Dr. Len Lothstein, UTHSC, BIO 451 & 452 (Dr. Gary Lindquester)

Landon LaSalle '12 *Biochemical and morphological exam of tail regeneration in lizards.* BIO 451 & 452 (Dr. Jon Davis)

Luke Lauder milk '13 *Exploring a potential non-canonical role of microRNA in up-regulating mRNA transcripts.* Dr. William Evans & Dr. Steven Paugh, St. Jude, BCMB 451 & 452 (Dr. Gary Lindquester)

Phillip Lyons '12 *Testing sexual differences in 2D:4D ratios in striped newts.* Dr. Jen Germano, Memphis Zoo, BIO 451 (Dr. Sarah Boyle)

Matthew McCravy BMB '12 *Molecular characterization of hemoparasites in local snakes.* BCMB 451 & 452 (Dr. Laura Luque de Johnson)

Rebecca Miller '12 *Cytological analysis of an *S. cerevisiae* Rb homologue Whi5 to mark commitment to the cell division cycle.* BIO 451 & 452 (Dr. Mary Miller)

Jess Newman '13 *Cryopreserving amphibian sperm.* Dr. Jen Germano, Memphis Zoo, BIO 451 (Dr. Sarah Boyle)

Alex Nord '11 *Use of an invasive plant by native birds in an urban landscape.* BIO 452 (Dr. Michael Collins)

Blaire O'Neal '12 *Natural resource overlay of Teton County, Wyoming.* BIO 451 (Dr. Sarah Boyle)

Blaire O' Neal, '12 *Potential brownfields in Memphis, TN: Conwood Company, LP in the Wolf River harbor target area.* BIO 452 (Dr. Rosanna Capellato)

Jordan Perchik '13 *The development of non-invasive reproductive hormone monitoring techniques for endangered Amur and snow leopards.* Dr. Erin Willis, Memphis Zoo, BIO 451 & 452 (Dr. Sarah Boyle)

Chris Perkins '13 *Characterization of cytoskeletal rearrangement in red blood cells after interaction with Plasmodium protein EBA-175.* BIO 451 & 452. (Dr. Laura Luque de Johnson)

Michael Pluta BMB '11 *Deletion of multiple septation genes in Aspergillus nidulans.* BIO 451 & 452 (Drs. Terry Hill, Loretta Jackson-Hayes, Darlene Loprete)

Allison Price '11 *Use of MP2, DFT and semi-empirical calculations of protein-ligand interaction energies and ab initio QSAR*

in the development of novel statin drug. Honors Research (Dr. Mauricio Cafiero)

Salar Rafieetary '12 *Effects on aggression of pharmacological manipulation of the central vasotocin system.* BIO 451 & 452 (Dr. David Kabelik)

David Siu '12 *Effects on aggression of pharmacological manipulation of the dopaminergic system.* BIO 451 & 452 (Dr. David Kabelik)

Leah Singh '11 *Immunohistochemical localization of neural activation following aggressive encounters.* BIO 451 & 452 (Dr. David Kabelik)

Monique Smyth '13 *Functional analysis of the SccA gene in Aspergillus nidulans.* BIO 451 & 452 (Drs. Terry Hill, Loretta Jackson-Hayes, Darlene Loprete)

Jared Swenson '11 *Examination of migration patterns and stopover sites using radar.* Bio 452 (Dr. Michael Collins)

Sarah Tchang '12 *An environmental case study: the creation of potential brownfields at the Old Firestone Tire and Rubber Plant in Memphis, TN.* BIO 452

(Dr. Rosanna Capellato)

Xiao Wang '13 *Identification of a mutation in the Myosin gene in Aspergillus nidulans.* BIO 451 & 452 (Drs. Terry Hill, Loretta Jackson-Hayes, Darlene Loprete)

Kristen Wendt '14 *Development of a Spore-PCR Protocol for use with Aspergillus nidulans.* BIO 452 (Dr. Terry Hill)

Diana Wong '12 *Diversity of tree species on Rhodes Campus.* BIO 451 & 452 (Dr. Rosanna Capellato)

Emily Woods BMB '12 *Complementation analysis of TH173 dependent cyclin defects in S.cerevisiae.* Research Assistant (Dr. Mary Miller)

Zongyu (Christopher) Yang '13 *Molecular mechanisms of drug resistance in relapsed leukemia.* Dr. Jun J. Yang, St. Jude Children's Research Hospital (Dr. Laura Luque de Johnson)

Alex Yu '13 *Molecular characterization of hemoparasites in local snakes.* BIO 451 & 452 (Dr. Laura Luque de Johnson)



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