



# BIOFEEDBACK

THE NEWSLETTER OF THE BIOLOGY DEPARTMENT AT RHODES

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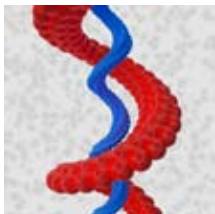
The purpose of *BIOFEEDBACK* is to provide an important and timely vehicle for the dissemination of information concerning BOTH faculty and students of the Biology Department. Any notices or information that you wish to include in *BIOFEEDBACK* should be submitted to either Dr. Carolyn or Dr. Alan Jaslow.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

interests. The student research pages on the Biology web site not only list what other students have done, but they provide links to various off-campus opportunities. You may also identify your own opportunities by searching for summer research programs. There are enough research opportunities out there so that nearly any qualified applicant can find a position. Let your advisor know if you need help finding yours.

—Dr. Gary Lindquister

## The Chair's Niche

**A**s you read through this issue of Biofeedback, notice all the references to research. We highlight faculty publications and grants, we list ongoing student projects, and we celebrate the results of student/faculty research collaborations. Why is research so important and how can you get involved?



Rhodes College aspires to graduate students who are life-long learners. These are individuals who demonstrate curiosity and a desire to expand their knowledge. Independent research with a faculty mentor is one method of pursuing this goal. Students who perform

research not only gain the practical benefits of becoming more competitive for graduate and professional schools, they also develop the skills, knowledge, and confidence to contribute, often substantially, to scientific progress. There is a deep satisfaction knowing that your work has added yet another piece to the puzzle of biological knowledge.

If this kind of engagement is one of the reasons you came to Rhodes, then you need to know how to get involved in research. Opportunities are increasing all the time. Rhodes' capital campaign is seeking support for student fellowships. The Biology Department is hoping for approval of the \$1.6 million grant proposal we submitted to the Howard Hughes Medical Institute, largely for student research support. The best ways to learn about research opportunities are by reading the list of student projects at the end of *BIOFEEDBACK*, and by checking out [www.rhodes.edu/biology](http://www.rhodes.edu/biology). There you will find links to faculty pages with research descriptions. Read these and then talk to the faculty with whom you share

## Primary Productivity and Secondary Growth

The following is a list of honors, awards, publications and meeting participation of our faculty and students since October 18, 2007



## Honors and Awards

### CONGRATULATIONS TO

.... **Dr. Mary Miller**, who was awarded tenure last year and was promoted to Associate Professor. Dr. Miller was also elected a councilor for CUR, the National Council on Undergraduate Research that promotes high quality undergraduate student-faculty collaborative research and scholarship.

.... **Michael Boehmler '09**, who won last semester's *BIOFEEDBACK* contest to match comments with specific Biology classes. Check your favorite hangouts in Frazier Jelke for this semester's contest.

.....**Stephanie Juchs '08** and **Kacie Ross '08**, who were named fellows of the the Rhodes Institute for Regional Studies in the summer 2007, under the supervision of the Institute's faculty mentor **Dr. Rosanna Cappellato**. The students' research produced two papers: "*The Establishment of a Greenspace in the Hollywood-Springdale Community*" by **Stephanie Juchs** and "*The Midtown North Greenline: A Rail-trail for Hollywood-Springdale*", by **Kacie Ross**.

**Please be sure to let us know about your awards, honors and activities.**



## Grants and Fellowships

The National Science Foundation has awarded

**Dr. Mary Miller** a supplement

to her current grant to increase the number of students able to work with Dr. Miller on her research. This award increases Dr. Miller's current NSF funded grant to a total of \$299,000.

**Dr. David Kesler**, along with D.P. Gillkin of Vassar College and D. Goodwin of Denison University, received a Mellon Foundation Faculty Career Enhancement Grant of \$23,200 for investigating "Freshwater bivalves as archives of past environmental and climatic conditions."

**Dr. Jonathan Fitz Gerald** received funding from the Rhodes Student Associate Program to hire a student this spring who will become a Digital Imaging and Analysis (DIA) technician. The DIA technician will be learning computational methods in digital microscopy and applying these both to faculty projects and as a peer mentor for laboratory courses. Dr. Fitz Gerald is also the recipient of Hill Funds for Curriculum Development and Pedagogical Innovation for his proposal entitled "Designing a Combined Mathematics, Computer Science and Biology Course Using Recombinant Inbred Plant lines". Dr. Fitz Gerald will use these funds during the summer to develop a practical course in biostatistics and quantitative genetics.

## Publications:

**Fenster, C.P.**, S.D. Fenster, H. Leahy, C. Kurschner, and **J.A. Blundon**, 2007. Modulation of Kv4.2 K<sup>+</sup> currents by neuronal interleukin-16, a PDZ domain-containing protein expressed in the hippocampus and cerebellum. *Brain Res.* 1162:19-31.

Berger, F., **J. Fitz Gerald**, and M. Ingouff. 2007. *Arabidopsis* as a Model for Understanding the Basics of Endosperm Development. In: Olsen, O-A, ed. *Endosperm: Developmental and Molecular Biology, Plant Cell Monographs Volume 8*. Springer-Verlag Berlin Heidelberg; 91-110. **Be sure to send us copies of your publications when they appear!**



## Meetings

In December, **Dr. Mary Miller, Sarah Mercer '08,** and **Tyler Cullender '08** attended the international

American Society for Cell Biology meeting in Washington DC. There, Sarah presented "Impairment of G1 Cyclin Cln3 Dependent Viability in the Absence of *KAP114* and *QUE1* in the Budding Yeast *Saccharomyces cerevisiae*" and Tyler presented "The Activity of the Budding Yeast G1 Cyclin Cln3 in the Absence of *NUP84*".



## Curricular Evolution

### New Faculty and Course Updates for '08-'09

Currently, the Biology Department is in the process of hiring people to fill two new positions. The first is a one-year position for a **Microbial Ecologist**. It is planned that this person will teach the traditional Microbiology class with lab in the spring, and a Microbial Ecology class without lab in the fall (see Special Topic- Microbial Ecology, below). The second position is a three-year **Memphis Zoo – Biology Postdoctoral Fellow** who will teach courses at Rhodes and do research with the staff at the Memphis Zoo and Aquarium across the street. Next spring, this post-doc will be teaching a section of senior seminar (see information about senior seminar options and the lottery, below). If you have any interest in zoo related research or issues, please let Dr. Kesler know about this now so he can invite you to meet with the post-doctoral candidates we bring to campus. You can read about some of the Zoo's programs at <http://faculty.rhodes.edu/kesler/Conservation%20Summary%202006-2007.pdf>.

### Special Topic Microbial Ecology

**Microbial Ecology (BIO 365)** studies the interactions of microbes with each other and their environment. The course is likely to cover a variety of interesting and timely topics ranging from community biology to the effects of global warming to bioremediation. The course will have Biology 130 and 140 as prerequisites, and it will satisfy a requirement for an upper level Biology class without lab. Microbial Ecology should also meet one of the Environmental Sciences course requirements, pending approval.

### Ecology (BIO 315) requires weekend field trips

If you are planning to take Ecology (BIO 315) this fall, please keep in mind that there are required field trips on the first two Sundays of the semester, and an overnight field lab Friday, September 26<sup>th</sup> – Saturday the 27<sup>th</sup>. For this overnight experience, students may choose to spend the entire 24 hours at the lake collecting samples, or arrive to do their data collection and then leave for other obligations. For some pictures of these great field experiences, see [http://faculty.rhodes.edu/kesler/2006\\_Ecology\\_photos.html](http://faculty.rhodes.edu/kesler/2006_Ecology_photos.html)

### **Virology/Immunology**

**(BIO 330)** will be offered for the first time in several years by Dr. Gary Lindqueter. About a fourth of the course will be devoted to the basic structure and function of viruses, general aspects of viral life cycles, and modes of pathogenicity and epidemiology. The remainder of the course will look at the immune system and its various appropriate and inappropriate responses to antigens. Students will learn important concepts through a problems-based approach which will have small groups working together in the computer lab during much of the class time to dig up answers to interesting questions and present their findings to the class. Virology/Immunology satisfies a requirement for an upper-level Biology class without lab.

### **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 is Tue lab meeting from 12:30-3:30 PM. The second lab each week is Fri. for a minimum of 50 minutes, either from 1-1:50 PM or from 2-2:50 PM. Two additional lab hours are required but these may be 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. 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 1PM 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 (BIO 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 Cell or Biochemistry previously, or intend to take one or both in the future, cannot sign up for it on the tree. Instead, they should contact Professor Hill or Professor Loprete as soon as possible.

### **What's Up for Spring?**

During the spring semester, we expect to offer the following upper level Biology classes: Embryology, Mechanisms of Development, Coral Reef Ecology, Microbiology, Conservation Biology, Molecular Biology, Neuroscience, and Topics in Biomedical Science. This list may change, should unexpected circumstances arise.



## **Optimal Foraging**

The following courses will be offered next semester

| <b>NUMBER</b>         | <b>COURSE TITLE</b>                      | <b>HOURS OFFERED</b>                         |
|-----------------------|--|--|
| 130                   | Biology I (FitzGerald/Hill/Miller)       | TuTh 8-9:15 or 11-12:15                      |
| 131                   | Biology I Lab                            | Tu 12:30-3:30, Wed 1-4, or Th 12:30-3:30     |
| 200                   | Evolution (Olsen)                        | TuTh 8:00-9:15                               |
| 304                   | Genetics (Miller)                        | MWF 10:00-10:50, W lab 1:00-4:00             |
| 307                   | Cell Biology (Hill)                      | TuTh 9:30-10:45                              |
| BCMB 310              | Methods in Cell Bio/Bioch (Hill/Loprete) | W 1:00 – 5:00                                |
| 315                   | Ecology (Kesler)                         | MWF 9:00-9:50, Tues lab 12:30-3:30           |
| 330                   | Virology/Immunology (Lindqueter)         | TuTh 9:30-10:45                              |
| 340                   | Animal Physiology (Blundon)              | TuTh 8:00-9:15, Tues lab 1:00-5:00           |
| 350                   | Comp Vert Morph (AJaslow)                | MWF 9:00-9:50, Tue lab 12:30-3:30, F lab 1-3 |
| 360                   | Histology (CJaslow)                      | MWF 10:00-10:50, Wed lab 1:00-4:00           |
| 365                   | Topics in Microbial Ecology (Staff)      | MWF 11:00-11:50                              |
| <b>For Non-Majors</b> |  |  |
| 105                   | Environmental Science (Cappellato)       | MWF 10:00-11:00, M lab 1:00-4:00             |

### Environmental Science Minor News

- If you are an Environmental Science Minor, or are thinking of declaring this minor, there are some changes coming. Geology 111 and 214, or their equivalents, may not be offered due to Professor Ekstrom's retirement, and Geology 116 may also not be given next semester. We are in the process of looking for adjunct faculty to teach courses that will support the ES Minor, and we are aware that requirements for the minor may need to change.

Next semester will see new post-doctoral fellows coming to Rhodes to teach courses outside the sciences with environmental studies emphases. This will greatly increase the selection of nonscience courses for the minor. If you have any questions, please contact Dr. Kesler (kesler@rhodes.edu).

### SENIOR SEMINAR LOTTERY

**Monday, March 31<sup>st</sup>**

Next year, the Biology Department will offer three sections of Senior Seminar (topics described below), plus there may be limited opportunities to enroll in a Neuroscience senior seminar. **All rising Biology seniors must reserve a slot in a fall or spring senior seminar section via lottery to be held in the Biology Library at 12:00 noon on Monday, March 31<sup>st</sup>.** 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 preregistration tree under the category of "Other Courses" when you do pre-registration for that particular semester. Biology students will not be allowed to enroll in a seminar section other than the one which they reserved. If you have questions about the lottery, or are planning to graduate in December, contact Dr. C. Jaslow by Friday, March 28<sup>th</sup>.

### Senior Seminar Choices for '08 – '09

BIOL 485 (1): Meeting on Tu/Th 4:00-5:15, **Dr. Sara Gremillion's** fall seminar is "**Phytopathology**". Are you

concerned about world hunger? Do you ever wonder about the struggles that humans face to produce enough food to support life and fuel domestic and international economies? If so, this senior seminar may be the course for you. Phytopathology is the study of plant diseases, infections causing major losses in plant health which, in turn, impact food crops and global economies. The course will cover basic concepts including the importance of interactions between the host plant, the pathogen and the environment. Major classes of disease-causing agents, such as fungi, bacteria, viruses and nematodes, will also be discussed. Further emphasis will be placed on pathogenesis and concepts of disease diagnosis and management. Students will share primary responsibility of choosing course topics and for presenting course material to the class through oral presentations. Students will also present and discuss primary research literature in the field.

BIOL 486 (1): Meeting on Tu/Th 4:00-5:15, **Dr. Terry Hill's** spring seminar is "**Medical Mycology**". The course will focus on fungal pathogens of humans and other animals – with student elected topics such as molecular mechanisms of pathogenesis,



the ecology of fungal pathogens, cellular aspects of development, molecular biology of drug resistance, recent advances in vaccine development. Emphasis will be placed upon recent research from the primary literature, selected, presented, and discussed by students in the class. 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): The third Biology senior seminar will be offered in the spring by the new **Memphis Zoo - Biology Department Postdoctoral Fellow** and will meet Tuesday and Thursday from 11:00 – 12:15. Although



the specific topic of this seminar is undetermined, it will likely cover some aspect of animal biology, conservation, or environmental management.



## Signals and Displays (short communications)

### TN Academy of Science Meetings

The Western Collegiate Tennessee Academy of Science Meeting will be held at the University of Memphis on Sat. April 5<sup>th</sup>. This is a chance for you to learn about the research conducted by undergraduates in our area. You do not need to present a poster or paper to attend. Come support Rhodes at this event. If you have any questions, contact Dr. Kesler – he'll even give you a ride to the meeting!



## Biology Seminar Series

Our final scheduled seminar is coming up quickly. On Monday, April 7, Natalie Bailey '96 from the Bushmeat Crisis Task Force in Washington, DC, will speak on "Eating in The Rat or



Eating Rats, From Rhodes to the Bushmeat Crisis". Please come hear her talk.

The seminar will begin in FJ-B at 4:15. Refreshments, and an opportunity to meet and speak to Ms. Bailey, will be available in the Biology Library at 4:00.

## Tri-Beta News

Beta Beta Beta (BBB) is the biological honor society for the Rhodes Biology Department. BBB has a two-fold purpose. The first is to provide a club where individuals with a shared interest in biology can get together, in a setting free of classroom pressures, and have a little social interaction and fun. The other purpose is that of an honor society. BBB is a national honor society and 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 Sciences, work on a collaboration between Central High School students and post-docs from St. Jude, a Science Fair Expo for Snowden Elementary School students in April, and monthly meetings. BBB provides a forum to recognize those students, with biology as their undergraduate major, who excel aca-

demically. Regular membership can only be attained through invitation, but any student meeting the criteria below who is interested in becoming an associate member for the next school year should contact the BBB president. If you are interested in membership, please contact current BBB president, Amy Ross (rosas@rhodes.edu).

### BBB Associate Membership requirements:

- 1 completed biology course (grade of B or better)
- An interest in biology
- One time \$50 initiation fee

### BBB Regular Membership requirements:

- Must be a Biology Undergraduate
- 3 completed semesters of Biology at Rhodes
- At least a 3.0 average in Biology at Rhodes and 3.0 average overall
- General good academic standing at the college
- One time \$45 initiation fee

\*\*Those associate members who now qualify for a regular membership will have a \$10 promotion fee.

## \$\$ Biology Research Award \$\$

This spring, the Biology Department will again 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 and cash prize. To be considered, a student must submit a three to five page research paper, plus a recommendation from the research supervisor, to Dr. C. Jaslow by Wednesday, April 2nd. Copies of the recommendation from may be obtained from Dr. C. Jaslow. Announcement of the award winner will be made at spring awards ceremony on Friday, April 25<sup>th</sup>.

## Memphis Zoo Volunteer

We have placed a few students at the Memphis Zoo this last semester who volunteer in such areas as "hoofstock." If you have an interest in volunteer-

ing at the Memphis Zoo, please see Dr. Kesler for an application.

## Work in the Biology Department!

The Biology Department is looking for several students to work as lab TA's for the core biology classes next fall and spring. These TA positions will consist of approximately 8-10 hours a 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 Christian Hardin at 843-3561 (email: Hardin@Rhodes.edu) for additional information. Applications for the lab TA job can be found outside room FJ 127W. The deadline for the fall/spring positions is April 28, 2008.

## Your Chance to Win a Fabulous Prize -

Biology contest forms will be distributed throughout FJ when BIOFEEDBACK comes out. Look for your chance to win a \$15 Bookstore gift card, and be sure to keep your copy of BIOFEEDBACK handy when you fill it out! If you can't find a contest form nearby, you may request one electronically from Biology Department Assistant Karen Thomas (thomask@rhodes.edu). All contest entries must be turned in to the Biology Department Office FJ102 before 4:00 PM on Friday April 11, 2008. If there are multiple correct entries, the winner will be selected by a random draw.

# Student Research 2007-2008 Sponsored by Programs at Rhodes (Rhodes faculty supervisors listed)

- Baker, Lesley '10** *The binding of auto-reactive T0cells to MOG peptide in a mouse model of multiple sclerosis.* St. Jude Summer Plus Research Program with Dr. Terrence Geiger, St. Jude, (Dr. Gary Lindquester)
- Benoist, Frances '08** *Investigation of septation and cell wall mutants in Aspergillus nidulans.* Bio 451 & 452 (Dr. Sara Gremillion, Dr. Terry Hill, Dr. Darlene Loprete)
- Chavez, Brittany '11** *Genetic mapping of calcofluor hypersensitive mutations in Aspergillus nidulans.* Bio 452 (Dr. Terry Hill, Dr. Darlene Loprete)
- Cullender, Tyler '08** *Importance of the Nucleoporins Nup2, Nup84, and Nup188 in S. cerevisiae G1 Cyclin Cln3 Activity.* Honors Research (Dr. Mary Miller)
- Daniel, Tara '08** *Leaf Area Index (LAI) measurement and carbon dynamics of Overton Park forest.* Bio 451 & 452 (Dr. Rosanna Cappellato)
- Davis, Chris '09** *Effect of Epstein-Barr virus vLL-10 on pathogenesis of a murine gammaherpesvirus.* Bio 451 & 452 (Dr. Gary Lindquester)
- Gentry, Jacy '09** *The role of Memphis parks in storing and sequestering carbon dioxide.* Bio 451 & 452 (Dr. Rosanna Cappellato)
- Hancock, Jackie '10** *Thi73 dependent activity of the G1 cyclin Cln3 in S. cerevisiae.* Bio 451 (Dr. Mary Miller)
- Hartzes, Anastasia '08** *Correlations of sperm morphology with sperm quality and with intrauterine insemination success.* Bio 452 (Dr. Carolyn Jaslow)
- Huddleston, Mary Elizabeth '10** *GFP tagging of a membrane protein affecting cell wall integrity in Aspergillus nidulans.* Bio 451 & 452 (Dr. Terry Hill, Dr. Darlene Loprete)
- Jain, Natasha '08** *The impact of Huntington's Disease on the correlation of cortical and striatal mutant neurons of R6/2 chimera mice* with Anton Reiner, Neurobiology, UT Memphis (Dr. Gary Lindquester)
- Juchs, Stephanie '08** *Use of RFLPA and morphometrics to determine which species of Corbicula is in the Wolf River.* Bio 451 (Dr. David Kesler)
- Kokoreva, Natalija '10** *Differential stimulation of monocytes to secrete secretory leukocyte protease inhibitor by lipopolysaccharide of periodontal pathogens.* with Dr. Jegdish Babu (Dr. Gary Lindquester)
- Lambeth, Lauren '09** *The impact of English ivy on the native vegetation of Overton Park.* Bio 451 & 452 (Dr. Rosanna Cappellato)
- Marsidi, Audrey '09** *Effect of Epstein-Barr virus vLL-10 on pathogenesis of a murine gammaherpesvirus.* Bio 451 & 452 (Dr. Gary Lindquester)
- Mercer, Sarah '08** *G1 cyclin dependent transcriptional activation of the KAP114 karopherin in S. cerevisiae.* Research Associate with Dr. Mary Miller
- Minhas, Anum '09** *Bone mineral density in pediatric survivors of hodgkin's lymphoma,* St. Jude Summer Plus Research Program with Dr. Sue Kaste, St. Jude (Dr. Alan Jaslow)
- Minhas, Anum '09** *The Prevalence of Osteonecrosis in Patients Receiving Allogeneic Bone Marrow Transplant,* St. Jude Summer Plus Research Program with Dr. Sue Kaste, St. Jude (Dr. Alan Jaslow)
- Pan, Chris '11** *Genetic mapping of calcofluor hypersensitive mutations in Aspergillus nidulans.* Bio 452 (Dr. Terry Hill, Dr. Darlene Loprete)
- Parkinson, Betsy '10,** *Synthesis and function of carboxylesterase inhibitors, and their role in cancer treatment.* St. Jude Summer Plus Research Program with Dr. Phil Potter, Molecular Pharmacology Lab, St. Jude
- Phelps, Crystal '08** *Cloning of the sepH allele and its effect on development of a calA mutant strain of Aspergillus nidulans.* Bio 451 & 452 (Dr. Terry Hill, Dr. Darlene Loprete)
- Pluta, Michael, '11** *Genetic mapping of calcofluor hypersensitive mutations in Aspergillus nidulans.* Bio 452 (Dr. Terry Hill, Dr. Darlene Loprete)
- Roads, Andy '09** *Soil carbon flux from turf-grass in the Memphis golf clubs.* Bio 451 & 452 (Dr. Rosanna Cappellato)
- Ward, Jackie '10** *Identification of a gene affecting hyphal development in Aspergillus nidulans.* Bio 451 & 452 (Dr. Terry Hill, Dr. Darlene Loprete)



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Rhodes College

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