



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.



The Chair's Niche:

In January of this year, the faculty in the department submitted and gained approval for new Biology degree requirements. The description of this degree is presented in this issue of Biofeedback and will appear in the 2006-2007 Rhodes College electronic catalogue. In the new degree, we attempted to simplify our requirements by offering only one degree – the Bachelor of Science, provide more student electives, and give students greater choice on what courses would satisfy our math requirement. The principle changes in our new degree are listed below:

- 1) Only a Bachelor of Science degree is offered
- 2) The Bachelor of Science degree will require the following biology courses: two introductory biology courses, six upper level biology courses (four with associated labs), and one senior seminar
- 3) The Bachelor of Science degree will require the following cognate courses: two introductory chemistry courses, and two math/computer science courses
- 4) Greater options are available in fulfilling the math cognate requirement (see the major description for details)

Students interested in majoring in Biology who enter Rhodes next year will automatically begin work on their Biology degree described in the 2006-2007 catalogue. However, students who entered Rhodes prior to the 2006-2007 year, and are not graduating this spring can also declare for the new degree. If

you are just now declaring a major, you can simply list the 2006-2007 catalogue as your choice for your major. Note that you do not have to use the same catalogue for your major that you use for the college degree requirements. If you have already declared a major under a previous catalogue, you can switch to the new major requirements by filling out a declaration of major form and listing the 2006-2007 catalogue for your major. You can, of course, continue to work under any catalogue that you chose. Thus, if you want to have a Bachelor of Arts degree instead of a Bachelor of Science you can still do so. You are the one who has the options! Make the choice that is best for you.

If you have any questions about the new major, or simply want to talk over your options – make an appointment with your advisor. He or she will be happy to discuss this with you. The Biology faculty hope that you will agree that the new major is clearer, creates opportunities for electives, gives you more course choice, and is, in general, an improvement over our old major.

---- Dr. Chuck Stinemetz



Primary Productivity and Secondary Growth

The following is a list of honors, awards, publications and meeting participation of our faculty and students since October 22, 2005.

Honors and Awards:

CONGRATULATIONS TO ...

.....**Dr. Chuck Stinemetz**, was named to the Robertson Chair of Biological Sciences in November of 2005.

PLEASE BE SURE TO LET US KNOW ABOUT YOUR AWARDS, HONORS AND ACTIVITIES.

Grants and Fellowships:

Drs. Mary Miller and **Keith Pecor** each separately received FDE grants. The title of Dr. Miller's research was "Identification of Genes that function to move the G1 cyclin *cln3* into the nucleus." The Title of Dr. Pecor's research was "The effects of road salts on the chemical ecology of amphibians."

Dr. Carolyn Jaslow received a Frank Ling Research Grant from the Department of Obstetrics and Gynecology at the University of Tennessee for her work on CD9 and fertility.

Dr. Gary Lindquester received a 3 year NIH Academic Research Enhancement Award research grant for "Functional analysis of viral interleukin 10 in a murine gammaherpesvirus model."

Publications: (Be sure to send us copies of your publications when they appear! Thanks!)

Pecor, K.W. and Hazlett, B.A. 2006. A test of temporal variation in risk and food stimuli on behavioral tradeoffs in the rusty crayfish, *Orconectes rusticus*: risk allocation and stimulus degradation. *Ethology* 112:230-237.

Meetings:

The Ecological Society of America will be holding its annual meeting in Memphis, August 6-11, 2006. You can view information about this meeting at <http://www.esa.org/memphis/>.

Kesler, D.H., N. Van Tol, D. Manning, and D. Hubbs. 2005. Freshwater mussels of the Hatchie River in western Tennessee. Tennessee Academy of Science Meeting, Martin, Tennessee.

In November, **Dr. Jay Blundon**, Dr. Cate Fenster, **Aaron Creek '07** and **Sini Nwaobi '07** presented their research at the Annual Society for Neuroscience Conference in Washington, D.C. The title of their research was "Neuronal Interleukin-16 Interacts with Kv4.2 and Regulates A-type K⁺ Channel Function."

Curricular Evolution:

Course Changes and Announcements

NEW BIOLOGY DEGREE REQUIREMENTS

Biology Degree Beginning 2006-2007 Academic Year*

Bachelor of Science Degree:

Required Biology courses include:

Introductory Courses: Biology 130, 131 140, 141

Upper Level Courses Required: Six upper level courses, 4 of which must have an associated lab experience. Four credits of research in Biology 451 and 452 will count as an upper level biology course with lab.

Senior Seminar: Either Biology 485 or 486 taken in the senior year.

Required cognate courses:

Two Chemistry Courses: Chemistry 111, 111 lab and 112, 112 lab

Two Introductory Math and/or Computer Science Courses: One course from Math 111, Econ 290, Psych 211. One course from Math 115, Math 121, Computer Science 141.

*Students who enrolled at Rhodes prior to the 2006-2007 academic year may elect to graduate with these requirements. This will require that a student declare the 2006-2007 catalogue year on a declaration of major form.

Comparative Vertebrate Morphology Bio-350

Comparative will again be offered with two 9:00-9:50 lecture meetings most weeks, and two (but unequal) formal lab meetings a week. One is Tue lab which meets from 12:30-3:30pm. The second meeting each week is for a minimum of 50 minutes, either from 1:00-1:50 pm or from 2:00-2:50 pm each Friday. Two additional hours of lab are required but these may be done at other times during the week. The variable Friday meeting time will allow students to take a 1:00 or 2:00 MWF class along with Comparative. Before the tree runs, the registrar will remove the Friday lab component from the program to allow Banner to add the 1:00 or 2:00 MWF class. Following registration, the Friday lab will be added back to Comparative students' schedules.

See Dr. A. Jaslow if you have any questions.

New Major Neuroscience

This fall, Rhodes College will offer a new Neuroscience Major. The Neuroscience Program at Rhodes is an interdisciplinary program drawing on strengths from the Departments of Biology, Psychology, Chemistry and Philosophy. If you are interested

in majoring in Neuroscience, please contact Drs. Jay Blundon (Biology) or Robert Strandburg (Psychology), and visit the Neuroscience website at <http://www.rhodes.edu/biology/blundon/Neuro> for more information.

NEW MINOR Environmental Sciences

Coming this fall, the Biology Department is offering a new interdisciplinary minor. The Environmental Sciences minor will complement any chosen major at Rhodes College by focusing on courses which relate to a variety of current environmental issues.

This new minor will broaden the understanding of how the various sciences are interlinked with regard to environmental questions, and will provide basic scientific aspects to those students interested in environmental law, environmental justice, environmental-economics, and environmental policy formulation.

Minor Requirements

Required courses (8 credits)

- Geology 103 Global Change or Geology 111-111L Introduction to Earth System Science, and
- Biology 105 Environmental Science

Electives (total of 16-20 credits, three science courses at the 200 or higher level, one environmentally-oriented course, an environmentally-oriented experience based on experiential learning)

Three courses from the courses listed below:

Biology 254 Coral Reef Ecology
 Biology 315 Ecology
 Biology 212 and 214 (taken together) Environmental Issues in Southern Africa
 Biology 210 Conservation Biology
 Chemistry 406 Instrumental Analysis
 Chemistry 422 Advanced Organic Chemistry
 Geology 214-214L Environmental Geology

- One additional environmentally-oriented course 200 or higher level approved by the program committee (committee composition described below) not necessarily of-

ferred through a natural science department. Departments that might have appropriate courses outside of the natural sciences include political science, economics and business administration, anthropology/sociology, history, etc.)

- One additional environmentally-oriented experience course based on experiential learning. These experiences will be approved by the environmental science committee but may include: Independent research, internships, service projects, summer experiences, international experiences

SENIOR SEMINAR LOTTERY Monday March 22nd

Next year, the Biology Department will again offer

Optimal Foraging

The following courses will be offered next semester
 For information and syllabi, and a tentative list of courses to be offered next spring, check out the Biology Dept. home page:
<http://kesler.biology.rhodes.edu/biol.html>

NUMBER	COURSE TITLE	HOURS OFFERED
130	Biology I	TuTh 8 – 9:15 or 11 – 12:15
131	Biology I Lab	TuTh 12:30-3:30 Wed 1:00 – 4:00
200	Evolution	MWF 11:00-11:50
301	Microbiology	MWF 10:00-10:50 Fri lab (1:00 – 4:00)
307	Cell Biology	TuTh 9:30 – 10:45
310	Methods in Biochem & Cell	Wed 1:00 – 4:00
315	Ecology	MWF 9:00 – 9:50 Tue lab 12:30-3:30
340	Animal Physiology	TuThu 11:00 – 12:15 Mon lab (1:00 – 5:00)
350	Comp Vert Morph	MWF 9:00 – 9:50 & labs Tue (12:30 – 3:30), F (1 – 3)
360	Histology	MWF 8:00 – 8:50 Wed lab (1:00 – 4:00)
FOR NON-MAJORS		
105-1	Environmental Science	10:00-10:50 MWF Th lab (12:30 – 3:30)

multiple sections of Senior Seminar (topics are described below), including the interdisciplinary section taught in collaboration with faculty from St. Jude Chil-

dren's Research Hospital. **Rising seniors must reserve a slot in a senior seminar section.** If you want to enroll in the St Jude Interdisciplinary seminar, you must speak as soon as possible to Dr. Jay Blundon in FJ 142W (x3169 or e-mail blundon@rhodes.edu). These opportunities are limited and only 9 students total will be enrolled from Psychology, Chemistry and Physics as well as from Biology. **Students who wish to enroll in one of the other four seminars must do so via lottery to be held in the Biology Library at 12:00 PM on Wednesday, March 22.** If you cannot attend the lottery, you must send a representative prepared with an ordered list of your choices. Once you have signed up, either with an acknowledgement from Dr. Blundon, or through the lottery, you should list your reserved senior seminar section last on the preregistration tree under the category of "Other Courses." 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, speak to Dr. Miller millerm@rhodes.edu.

Senior Seminar Choices for '06 -'07

Bio. 485(1): **Dr. Cappellato's** fall senior seminar is entitled "**The Mississippi River**," and it will meet at 9:30-10:45 on Tuesdays and Thursdays. This course will focus on the history and ecology of the mighty river, with students reading and presenting background information and primary literature on the river.

Bio. 485(2): Dr. Stinemetz's fall senior seminar is entitled, "**Space Biology**." It will meet at 3:30 – 4:45 on Tuesdays and Thursdays. Space The final frontier. Join Captain (Professor) Stinemetz and boldly go where no bio majors have gone before! In this senior seminar we will be discussing how gravity has influenced the evolution of life systems on this planet, the challenges that biological organisms face in a microgravity environment, and how contained systems are designed to support life in space. During this senior seminar, you will 1) become familiar with experimental approaches employed by NASA and others in space biology, 2) gain an appreciation for the different levels of biological organization which a microgravity environment might alter, 3) recognize similarities between the responses of different organisms to microgravity, and 4) become familiar with current and past research in space biology. Student will select their own senior projects from various space biology fields (these range from designing life support systems to immune suppression in astronauts), independently research their topic of interest, present their work to their fellow classmates and write a review paper on their particular topic. A copy of a past syllabus for this course can be viewed at: <http://www.rhodes.edu/biology/stinemetz/Bio4851.htm>

Bio. 486 (1) : **Dr. Pecor's** spring senior seminar is "**Sexual Selection**," and it will meet at 4:00-5:15 on Tuesdays and Thursdays. This course will focus on such topics as sexual dimorphism, competition for mates, mate choice, mating strategies, and sperm competition in animals, including humans. These topics will be considered in terms of genetics, anatomy, and behavior.

Bio. 486(2): **Dr. C. Jaslow's** spring senior seminar is entitled "**Reproductive Biology**," and it will meet at 9:30 – 10:45 on Tuesdays and Thursdays. In the first half of the semester, this course will focus on human reproduction, with students reading and presenting background information and primary literature on predetermined topics such as sperm maturation 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 contraceptives, immunology and the fetus) to more general 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.

Interdisciplinary Senior Seminar 485: It will meet at 4:30- 5:45 on Tuesdays and Thursdays.. This fall semester, 9 faculty from St. Jude Children's Research Hospital, Department of Developmental Neuroscience, will visit Rhodes and present their research as part of the Rhodes/St. Jude Interdisciplinary Senior Seminar. The title of the semester's seminar will be "**Recent Advances in Neuroscience Research**". This seminar is open to seniors in Neuroscience, Biology, Chemistry, Physics, and Psychology. If you are interested in enrolling in this seminar, please contact **Dr. Blundon** as soon as possible before Biology seminar registration. The class is limited to 9 students.

Signals and Displays (short communications)

TN ACADEMY OF SCIENCE MEETINGS

The Western Collegiate Tennessee Academy of Science Meeting will be held at CBU on Sat. March 19. 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! The call for papers and abstract submission guidelines are now available at <http://www.cbu.edu/sciences/biology/TAS-CBU2005.htm>.

WORK IN THE BIOLOGY DEPARTMENT!

The Biology Department is looking for one student to work this summer in the department. The summer position is full time, 37.5 hours per week with weekends off. The position will start May 22nd and will go until August 11th, 2006. The department is also 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 hours a week of work. We prefer someone who has an interest in Biology and has taken Bio I and II for both jobs. Pay and further details concerning the jobs 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 both jobs can be found outside room FJ 127W. The deadline for the summer and fall/spring positions is April 17th, 2006.

\$\$ 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. Miller by Friday, March 31st. Copies of the recommendation form may be obtained from Dr. Miller. Announcement of the award winner will be made at spring awards ceremony on Friday, April 28th.

TRI-BETA NEWS

Beta Beta Beta ($\beta\beta\beta$) is the biological honor society for the Rhodes Biology Department. $\beta\beta\beta$ 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. $\beta\beta\beta$ 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, current research work on a collaboration between Central High School students and post-docs from St. Jude Hospital, a Science Fair Expo for Snowden

Elementary School students in April, and monthly meetings. $\beta\beta\beta$ provides a forum to recognize those students, with biology as their undergraduate major, who excel academically. Regular membership can only be attained through invitation, but any student meeting the criterion below that is interested in becoming an associate member for the next school year should contact the $\beta\beta\beta$ president. Membership for regular and associate members has already concluded for this school year (2005-2006). Any questions may be directed to $\beta\beta\beta$ president for 2005-06, Sonia Singh (sinso@rhodes.edu).

Membership requirements:

Associate Membership:

- ☞ 1 completed course of a natural science class
- ☞ An interest in biology
- ☞ One time \$20 initiation fee

Regular Membership:

- ☞ Must be a Biology Undergraduate
- ☞ 3 completed semesters of Biology at Rhodes
- ☞ At least a 3.0 average in Biology at Rhodes
- ☞ General good academic standing at the college
- ☞ One time \$30 initiation fee

BIOLOGY SEMINAR SERIES

Our final scheduled seminar is coming up quickly. On Thursday, March 30th, **Dr. Andy Gannon** from Birmingham-Southern College will be speaking about "Nonfatal attraction: An ecological and physiological perspective on a blue crab (*Callinectes sapidus*) and barnacle (*Octolasmis muelleri*) symbiosis". Please come hear him talk about crustaceans other than our familiar tasty crawdads!



Dr. Andy Gannon

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

Student Research 2005-06

Sponsored by Programs at Rhodes

- Lydia Andras '06.** *Circadian rhythms and crayfish behavior.* Bio. 452 with Dr. Keith Pecor
- Emily Backues '07.** *Genetic characterization of a Calcofluor-hypersensitive mutant of Aspergillus nidulans.* Bio 451 & 452 with Drs. Terry Hill and Darlene Loprete.
- Teresa Bell '07.** *Size-age relationship, patch growth, and genetics of the Pawpaw (Asimina triloba) in Overton Park.* Bio 451 & 452 with Dr. David Kesler
- Brittany Bostick '07.** *Ecological interactions between invasive plants and birds in the Mid-South.* Bio 452 with Jim Armacost, Jr.
- Taylor Brown '07.** *Genetic characterization of a Calcofluor-hypersensitive mutant of Aspergillus nidulans.* Bio 451 & 452 with Drs. Hill and Loprete.
- Christie Champion '07.** *Size-age relationship, patch growth, and genetics of the Pawpaw (Asimina triloba) in Overton Park.* Bio 451 & 452 with Dr. David Kesler
- Becky Cook '08.** *High copy suppression analysis of mislocalized G1 cyclin in budding yeast – characterization of the MCS6 and MCS9 suppressors.* Bio 451 & 452 with Dr. Mary Miller
- Meghan Davis '06.** *Generation of a recombinant murine herpesvirus (MHV) containing the Epstein-Barr virus interleukin 10 gene driven by the MHV gp150 promoter.* Bio 451 & 452 with Dr. Lindquister
- Jeff Freyder '06.** *Generation of revertant recombinant murine herpesviruses.* Bio 452 with Dr. Lindquister
- Gaines Fricke '06.** *Long term potentiation in CA3 hippocampal neurons in IL-16 knock-out mice.* Bio 451 & 452 with Dr. Jay Blundon.
- Valerie Hartmann '06.** *The role of light and oxygen in Chaoborus punctipennis diel vertical migration.* Bio 451 & 452 with Dr. David Kesler.
- Claire Litherland '09.** *Mendelian genetic studies of Calcofluor hypersensitive mutants in Aspergillus nidulans.* Bio 452 with Drs. Hill and Loprete.
- Adam Master '06.** *Ecological interactions between invasive plants and birds in the Mid-South.* Bio 452 with Jim Armacost, Jr.
- Sarah Mercer '08.** *Genetic characterization of a temperature-hypersensitive polarity mutant of Aspergillus nidulans.* Bio 451 & 452 with Drs. Terry Hill and Darlene Loprete.
- Sandy Obreza '06.** *Generation of a recombinant murine herpesvirus containing the Epstein-Barr virus interleukin 10 gene driven by the mouse phosphoglycerate kinase promoter.* Bio 451 & 452 with Dr. Gary Lindquister.
- Crystal Phelps '08.** *Mendelian genetic studies of Calcofluor hypersensitive mutants in Aspergillus nidulans.* Bio 452 with Drs. Hill and Loprete.
- Caroline Sartain '07.** *Deletion of a gene coding for a membrane protein in Aspergillus nidulans.* Bio. 452 with Drs. Hill and Loprete.
- Will Sheftall '07.** *Annuli formation in the freshwater mussel Elliptio complanata.* Bio 452 with Dr. David Kesler.
- Michael Spilman '06.** *Bioluminescent energy transfer based detection of protein-protein interactions in Saccharomyces cerevisiae.* Bio. 451 & 452 with Dr. Mary Miller.
- Mark Stratton '06.** *The role of light and oxygen in Chaoborus punctipennis diel vertical migration.* Bio 451 & 452 with Dr. David Kesler.



Cover page figures:

At left: African Elephant

www.spectrus.co.uk/africa/images/m_child2.gif.

At right: Human brain

<http://www.cs.princeton.edu/gfx/proj/sugcon/models/brain.png>