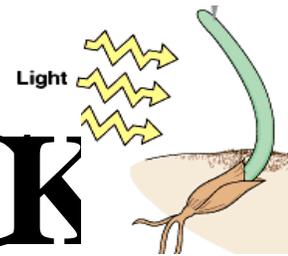


# BIOFEEDBACK

The Newsletter of the Biology Department at Rhodes



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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* will be published each semester.

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## The Chair's Niche:

Recently, I was asked to review the accomplishments of the Rhodes Biology Department over the last three years. After completing this review, I think it incumbent on me to express my gratitude to the students and faculty of our department for the many recent successes that have served to make our department one of the most vibrant academic units of the college. Evidence of student engagement include increased admission rates to professional programs, national awards for academic and athletic merit, high participation in college outreach efforts, and a renewed interest in student/faculty research. Faculty efforts during this period have included the revision of parts of the department curriculum, introduction of new student programs, improvements to the physical environment, and the aggressive pursuit of funding for faculty/student research programs. However, much still remains to be done. Rather than rest on past accomplishments, I have every confidence that the students, faculty, and staff of this department will continually review, revise, and improve on the many facets of the Rhodes biology program so that it continues to sparkle in coming years.

During the 2003-2004 academic year, Dr. Gary Lindquister will assume the department chair while I am on a one-year sabbatical. I am sure that you share my confidence that Dr. Lindquister will effectively execute the duties of this position and will support his efforts to continue our departmental growth. Although, I am very excited about my many sabbatical plans for next year, I look forward to returning in one year to encourage the efforts of such a dynamic, progressive program. Once again, thank you.

You have made these last three years as biology department chair enjoyable.

---- Dr. Chuck Stinemetz

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## Primary Productivity and Secondary Growth

The following is a list of honors, awards, publications and meeting participation of our faculty and students since October 23, 2003.

### Honors and Awards:

CONGRATULATIONS TO ...

.....the Biology Department's Faculty Fellow, **Dr. Romi Burks**, for accepting a tenure-track position as an Ecologist in the Biology Department at Southwestern University. Southwestern is a highly respected, small liberal arts college in Georgetown, TX, and belongs to the same consortium as Rhodes.

.....**Alison Groeger '04**, who won first prize for outstanding undergraduate poster presentation at the South Eastern Regional Yeast meeting this past weekend. Alison presented her work with Dr. Miller, "Characterization of the hydrophobic patch domain of the G1 cyclin of Cln2 in *Saccharomyces cerevisiae*".

.....**Matt Keogh '03**, who received a USDA-IFAFS Knowledge-Based Plant Improvement Fellowship that supports 3 years of graduate study at North Carolina State University.

.....**Jennifer Riem '03**, who received both a teaching fellowship as well as a 1<sup>st</sup> year graduate student scholarship to graduate school at Miami University of Ohio.

.....**Lisa Harsch '05, Lauren Fay '05, Daniel Dunnavant '04, and Adam Brewer '05**, who received \$4000 fellowships to do summer research on fungal genetics with Drs. Hill and Loprete.. These fellowships are funded by grants to Drs. Hill and Loprete

from the National Science Foundation and the Merck Company Foundation. In addition, **Daniel Dunnavant '04**, **Hung Hoang '05**, and **Chip Hartigan '05** received Merck Academic Year Fellowships to work on various aspects of phenotype characterization of wall mutants in *Aspergillus nidulans*.

.....The three biology majors who were selected for the Rhodes/St Jude Summer Plus program. These students (along with their St Jude mentors and departments) are: **Emily Bryson '05** (Dr. Richard Kriwacki, Structural Biology), **Kristin Campbell '05** (Dr. Jeff Sample, Biochemistry), and **Sandra Culpepper '04** (Dr. Michael Dyer, Developmental Neurobiology).

.....**Dr. Alan Jaslow**, who had three photographs published in Savage, J.M. 2002. *The Amphibians and Reptiles of Costa Rica*. The University of Chicago Press. 934pp.

.....**Sean Walton '03**, who was recently inducted into Psi Chi, a national psychology honor society.

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

## Grants and Fellowships:

**Dr. Mary Miller** was awarded a \$100,000 research grant from the National Cancer Institute, a division of the National Institutes of Health, to fund her studies of "Spatial regulation of G1 cyclins in the budding yeast *Saccharomyces cerevisiae*." This grant will support Dr. Miller's research on regulated cell division for the next three years. Dr. Miller also received a Rhodes Faculty Development Research Grant titled, "Protein stability and localization resulting from hydrophobic patch domain mutations of G1 cyclins" for the summer of 2003.

Other recipients of Rhodes' Faculty Development Grants were **Dr. Jay Blundon** for "Investigating the dual role of a brain protein, neuronal Interleukin-16," **Dr. Gary Lindquister** for "Mechanisms of immune evasion: development of an animal model for human Epstein-barr virus infection," and **Dr. Chuck Stinemetz** for "Isolation and characterization of ABA-dependent saline resistant proteins from *Iris hexagona*."

**Dr. Romi Burks** received an Environmental Alliance Grant (\$946) from the Associated Colleges of the South to co-sponsor (along with the Department of Biology) a Raising Campus Awareness speaker, Dr. Adrienne Froelich (Public Policy Director for the American Institute of Biological Sciences. Dr. Froelich gave a presentation entitled "Science or Science Fiction? – What is Environmental Policy Making?" She also participated in Dr. Burks's Wetland Ecology and Policy Course. Students from Hendrix

College and Birmingham Southern also attended this ACS-sponsored event.

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

**Hill, T. W.**, D. M. Loprete, **J. A. Castagna**, and **S. O. Weems '02**. 2003. Efficient high-volume cleaning of *Aspergillus nidulans* cleistothecia using bare fingers. *Fungal Genetics Newsletter* 50: 4-5

Loprete, D. M. and **T. W. Hill**. 2002. Isolation and Characterization of an endo-(1,4)- $\beta$ -glucanase secreted by *Achlya ambisexualis*. *Mycologia* 94:903-911.

Jonathan A. McCullers and **Kimberly C. Bartmess '04**. 2003. Role of neuraminidase in lethal synergism between influenza virus and *Streptococcus pneumoniae*. *The Journal of Infectious Diseases*. 187:1000-1009. This was the article featured on the cover.

## Meetings:

In February, **Dr. Romi Burks** gave a presentation "Cues, cues and more cues. *Daphnia* swim away from *Chaoborus*, crushed-up conspecifics and pelagic lake water chemical cues" within an Invited Symposium Session at the American Society of Limnology and Oceanography Aquatic Sciences Meeting, in Salt Lake City, Utah. At the end of March, **Dr. Burks** also participated in "Teaching Green" at Furman University. This pedagogical workshop, sponsored by the Associated Colleges of the South Environmental Alliance, aims to share ways that professors can integrate environmental issues into the classroom.

In November, **Amir Paydar '04** presented his research, "Signal transduction mechanisms of GABA-B regulation of calcium currents in hippocampal neurons" at the Society for Neuroscience annual meeting in Orlando, FL. This work was coauthored with T.J. Carter, P.T. Garland, and M. Mynlieff, from the Dept. of Biological Sciences at Marquette University.

Over the weekend of March 14th, **Drs. Mary Miller** and **Terry Hill**, and students **Alison Groeger '04**, **Tim Hoggard '03**, **Daniel Dunnavant '04**, and **Katie Jameson '05** attended the South Eastern Regional Yeast meeting at the University of Alabama in Birmingham. Alison presented her work "Characterization of the hydrophobic patch domain of the G1 cyclin of Cln2 in *Saccharomyces cerevisiae*" coauthored with **Dr. Mary Miller**. Also presented was "Genetic complementation of Calcofluor hypersensitivity in a

calC strain of the filamentous fungus *Aspergillus nidulans*," by **Timothy A. Hoggard '03**, **Mario K. Maruthur '03**, Darlene M. Loprete, and **Terry W. Hill**.

## Curricular Evolution: Course Changes and Announcements

### Comparative Vertebrate Morphology Bio-350

Comparative will again be offered with two B hr. Lecture meetings most weeks. This course requires two (but unequal) formal lab meetings a week. One is Tue (R) lab which will meet from 1-4pm. The second meeting each week is for a minimum of one hour either from approximately 1-2pm or from approximately 2-3pm each Friday. Two additional hours of lab are required but these may be at other times during the week. The variable Friday meeting time will allow students to enroll in an E or F hour class during registration. Before the tree runs the registrar will remove the Friday lab component from the program to allow Banner to add the E or F hour class. Following registration, the registrar will add the Friday lab back to comparative students' schedules. See Dr. A. Jaslow if you have any questions.

### Microbiology This Fall

Attention students interested in bacterial diversity or infectious disease!!! The Department of Biology will be offering Microbiology in the fall. Have two years gone by so quickly? NO! In the past this course has been offered in alternate years only, but will be offered sequentially this year. This course will be taught by Dr. Miller and will focus on the interactions between humans and prokaryotic organisms, focusing on bacteria. See the description of Biology 301 in the catalog for details on course requirements.

### Sabbatical Shifts in Biology Classes

This year, Dr. Kesler will be on sabbatical for the fall, and Dr. Stinemetz for the entire academic year. In the fall, Dr. Brewer will be teaching the Ecology class. Dr. Stinemetz's Mechanisms of Development class will not be offered in the spring, but Dr. Becker will be most likely be teaching Animal Behavior again. Details of the classes offered next spring will be in the fall issue of Biofeedback.

### SENIOR SEMINAR LOTTERY Wednesday March 26th

Next year, the Biology Department will again offer multiple sections of Senior Seminar (topics are described below), including the special interdisciplinary

section taught in collaboration with faculty from St. Jude Children'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 to Dr. Blundon as soon as possible. These opportunities are "first-come, first-served," and only 8 students will be enrolled. The deadline for giving your name to Dr. Blundon is Tuesday, March 25. **Students who wish to enroll in one of the other three seminars may do so via lottery to be held in the Biology Library at noon on Wednesday, March 26.** 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 Dr. Blundon, or through the lottery, your reserved senior seminar section should be listed 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. C. Jaslow.

Bio. 485(1): **Dr. C. Jaslow's** fall senior seminar is



entitled "**Reproductive Biology**," and it will meet at M hour. 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: This Fall 2003, the departments of Biology and Psychology at Rhodes College, along with the Department of Developmental Neurobiology at St. Jude Children's Research Hospital, will be offering a senior seminar in "Current Research Topics in Neuroscience". Similar in format to the St. Jude Cancer Senior Seminar offered in Fall 2002, the Neuroscience Senior Seminar will feature eight neurobiology research faculty from St. Jude. Each week, one of the St. Jude faculty will present a discussion of current research in Neuroscience, focusing on a key primary literature article. Students in the seminar will be responsible for reading the article before the presentation, and preparing

weekly summaries and discussion questions of the primary articles. Student participants in the seminar will be required to lead a discussion on the research topic prior to the presentation from the St. Jude faculty. A research paper will also be required of all student participants.

This seminar will be open to 8 Rhodes students, majoring in either Biology, Psychology, Physics, Chemistry or the interdisciplinary Biology-Psychology Bridge major. The course will be filled on a first come, first served basis. Possible topics of discussion may include aging disorders of the brain and mind (Parkinson's Disease, Alzheimer's Disease), development and developmental disorders of the brain, auditory and visual sensation/perception and sensory disorders, and gene therapy for neurobiological diseases. Please see Dr. Jay Blundon if you are interested in participating in this senior seminar. In the future, we plan to offer the St. Jude Cancer senior seminar in even years (Fall semesters) and the St. Jude Neuroscience senior seminar in odd years (Fall semesters).

Bio. 486 (1) (spring senior seminar): **Dr. Miller's** spring senior seminar is entitled "**Cancer Biology.**" Discussions will focus on the molecular basis of cancer, including impacts on cancer diagnosis and treatment. Students will read and discuss primary literature on topics including cell cycle regulation, apoptosis, signal transduction, DNA/RNA tumor viruses, the Rb tumor suppressor family, and mouse/tissue culture models for human cancer. Students will research a



topic of their own interest that is pertinent to cancer biology, provide a summary of their findings, present this topic to the class, and evaluate the presentations of other students. This class is scheduled for Tuesdays and Thursdays from 4-5:30.

Bio 486 (2) (spring semester): **Dr. Steven Brewer's** spring senior seminar is entitled "**Biological Diversity: Conservation and Assessment.**" Content of the course will include evaluating journal articles, oral presentations, a paper, and research-



ing topics related to biodiversity issues. Dr. Brewer's seminar is scheduled for **L hour**.

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## Signals and Displays (short communications)

### BIOLOGY WORKERS

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 and holidays off. The position will start May 27th and will go until August 15<sup>th</sup>, 2003. The department is also looking for 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

### 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	L or N
131	Biology I Lab	Tu,We,Th 1:00-4:00
301	Microbiology	B & Fri lab
307	Cell Biology	M
310	Methods in Biochem & Cell	Wed lab
315	Ecology	M & Thurs lab
330	Virology and Immunology	C
340	Animal Physiology	N & Mon lab (1-5pm)
350	Comp. Vert. Morph.	B, Tue & Fri labs
360	Histology	A & Wed lab
451	Research in Biology	TBA
460	Biology Internship	TBA
485(1)	Reproductive Biology	N
INTD 485(1)	Interdisciplinary (St. Jude)	Tu,Th 4:15-5:45

#### FOR NON-MAJORS

105	Environmental Science	F
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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](mailto:Hardin@Rhodes.edu)) for additional information or an application. The deadline for the summer and fall/spring positions is April 18, 2003.

## TN ACADEMY OF SCIENCE MEETINGS

The 2003 Tennessee Academy of Science Western Collegiate Division Meeting will be hosted by Union University at Jackson, TN on Saturday, April 5, 2003. Science undergraduates from western Tennessee colleges and universities will give 15-minute oral presentations of their research at this meeting.

An abstract submission form, registration information, and directions to Union may be found at [http://www.tnacadsci.org/annualMeeting/westernRegion/W\\_Div\\_Invite2003.html](http://www.tnacadsci.org/annualMeeting/westernRegion/W_Div_Invite2003.html). Several Rhodes Biology students will be presenting their work at this meeting. I hope you can come along to represent Rhodes and to support these students. If you have any questions, please feel free to contact **Dr. David Kesler** at [Kesler@rhodes.edu](mailto:Kesler@rhodes.edu).

## BIOLOGY SEMINAR SERIES

Our next (and last) scheduled seminar is coming up quickly. On Monday, April 7th, Dr. Sarah McGuire from Milsaps College will be presenting her research on cell division. Dr. McGuire's seminar, entitled "Identifying genes that regulate cell division using the fungus *Aspergillus nidulans*," will begin in FJ-B at 4:15. Refreshments, and an opportunity to meet Dr. McGuire, 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 here at Rhodes. 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. This semester we plan to go off campus to the zoo or IMAX, and will be participating in Rites to Play for the first time. Members will also be assisting with to the editorial duties for *The Rhodes Journal of Biological Sciences*, a department publication consisting of student research. 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. It also provides a forum to recognize those students, with biology as their undergraduate major, who excel academically. Invitations will be sent to those meeting requirements for regular membership. Any student interested in becoming an assistant member should email Emily Cunningham (cunej).

There are two forms of membership with the following 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 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 Monday, March 31. Copies of the recommendation form may be obtained from Dr. Miller. Announcement of the award winner will be made at spring awards ceremony on Tuesday, April 29<sup>th</sup>.



## Student Research 2002-03 sponsored by Programs at Rhodes

**Prentice Bowman '04.** *The fibrilization of p53tetWT and p53tetR337H at pH 4.* Bio 451 & 452 with Dr. Richard Kriwacki of St. Jude Children's Research Hospital.

**Katie Cox '03.** *Investigating the role of Neuronal Interleukin-16 on learning and memory in the murine brain.* Bio 451 & 452 with Dr. Jay Blundon.

**Courtney Frye '05.** *Domains of the EBNA-3C protein required for regulation of the EBV oncoprotein LMP-1.* Bio 451 & 452 with Dr. Clare Sample of St. Jude Children's Research Hospital.

**Tyler Gamble '06.** *The effects of seminal fluid on sperm mitochondria ultrastructure.* Bio. 452 with Dr. Carolyn Jaslow.

**Lisa Harsch '05.** *Quantifying the refuge effect of water lilies (Nymphaea) for Daphnia: Is it structure or shade?* Bio 451 & 452 with Dr. Romi Burks.

**Hung Hoang '05 and Chip Hartigan '05.** *Preliminary phenotype characterization of cell wall mutants in Aspergillus nidulans.* Merck/AAAS Fellowships with Dr. Terry Hill.

**Tim Hoggard '03.** *Plasmid recovery from a transformed strain of Aspergillus nidulans.* Bio. 451 & 452 with Dr. Terry Hill.

**Tim Hoggard '03.** *Localization of amyloplast in the DEZ region of gravistimulated roots using light microscopy.* Bio 451 & 452 with Dr. Chuck Stinemetz.

**Tim Hoggard '03.** *Isolation of a hydrotropic mutant of arabidopsis.* Bio 451 & 452 with Dr. Chuck Stinemetz.

**Katie Jameson '05.** *High copy suppression of mis-localized G1 cyclin CLN3 in Saccharomyces cerevisiae.* Biology 452 with Dr. Mary Miller.

**Daniel Keedy '06.** *A scanning electron microscopy examination of cortical cell shape and cell wall structure in sorbitol treated root caps.* Bio. 452 with Dr. Chuck Stinemetz.

**Matt Keogh '03.** *Localization of amyloplast in the DEZ region of gravistimulated roots using light microscopy.* Bio 451 & 452 with Dr. Chuck Stinemetz.

**Michael Lyerly '04.** *Variation in the morphological characteristics of subpopulations in bovine sperm.* Bio. 452 with Dr. Carolyn Jaslow.

**Forrest McCullough '04.** *Condition indices of Corbicula fluminea in the Wolf River.* Bio. 451 & 452 with Dr. David Kesler.

**Heidi Rademacher '05.** *Creation of a kinase-defective mPERK protein by point mutation.* Bio 4 with Dr. Linda Hendershot of St. Jude Children's Research Hospital.

**Jennifer Riem '03.** *Spider communities of riparian habitats along the Wolf River.* Bio 451 & 452 with Dr. David Kesler.

**Anna Seal '03.** *The effects of seminal fluid on sperm mitochondria ultrastructure.* Bio. 452 with Dr. Carolyn Jaslow.

**Sandra Scott '03.** Bio 451 & 452 with Dr. Chuck Stinemetz.

**Shauna Torrance '04.** *Development of a quantitative real time PCR assay for respiratory syncytial virus.* Bio 451 & 452 with Dr. Chuck Stinemetz.

**Ann Young '03.** *Investigating the role of Neuronal Interleukin-16 on learning and memory in the murine brain.* Bio 451 with Dr. Jay Blundon.

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### Cover Page Figures:

At left: A cross-bridge between myosin and actin in skeletal muscle. Fig. 49.33 from Campbell N.A. & J. B. Reece.2002. *Biology*. 6<sup>th</sup> ed. New York: Benjamin Cummings.

At right: Early experiments on phototropism by Darwin and Darwin (1880). Fig. 39.4 from Campbell N.A. & J. B. Reece.2002. *Biology*. 6<sup>th</sup> ed. New York: Benjamin Cummings.