



BIOFEEDBACK

The Newsletter of the Biology Department at Rhodes



Volume 17

23 October 2002

Number 1

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.

---- 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 March 9, 2001.

The Chair's Niche:

The leaves are beginning to fall, new student faces have appeared, old student acquaintances have been renewed, and the first issue of *BIOFEEDBACK* is out. For those of you receiving *BIOFEEDBACK* for the first time, this newsletter is an excellent summative resource for what goes on in the Biology Department. Past accomplishments, current news, and future opportunities are included within. Let me encourage you to take advantage of *BIOFEEDBACK* to both enhance your student experience while engaged in Biology and to share your successes with the other readers.

Students are sometimes unaware that the faculty meet each week to discuss important issues related to our department. Many of these issues directly or indirectly affect the experiences of our students. There have been many times in the past when it would have been useful to our decision making process to know the general view of students regarding some of the issues discussed at these meetings. To help facilitate the exchange of student/faculty views on issues and concerns in Biology, we are creating a student chair advisory group. This small working group will meet with the current Biology chair at least once each month to discuss issues of concern to students and to provide input into our departmental decision making process. Inclusion in this group will require an application. Look for announcements in the hallways in the near future! It is our hope that the careful selection of students to serve on this advisory group will assure that varied perspectives are represented and the interests of all students in departmental affairs are more readily communicated. I strongly encourage you to apply for one of these positions.

Honors and Awards:

CONGRATULATIONS TO ...

.....**Chris Huff** and **Forrest Busler**, who were co-winners of the Outstanding Biology Senior Award for the '01-'02 academic year. Additionally, **Evgenueni Krynetski** and **John Goss** were co-named the recipients of the 2002 Award for Outstanding Student Research in Biology. For more information about this research award, see "Signals and Displays" on page 6.

.....**Chris Huff '02** also for his honors recognizing his combined athletic and academic excellence. Chris was not only granted the Walter E. Gay Award for male athlete of the year, but he received a \$5,000 NCAA Postgraduate Scholarship for 2002-03. Chris is attending the University of Tennessee Medical school this fall. These awards are highly competitive as only 58 such scholarships are given out nationally each year to 29 men and 29 women who participate in fall sports.

.....several recipients of scholarships for British Studies. **Marian Butcher '03**, **Emily Cunningham '03**, and **Anna Seal '03**, who were awarded John Henry Davis Scholarships, and **Natalie DuMont '04** received The Kristen and Vernon Hurst Scholarship.

.....**Kelley Savage '03**, who was awarded the Margaret Hyde Council Scholarship.

.....**Veena Rajanna '03** who received the Jeanne Scott Varnell Award in Classical Languages.

.....**Kimberly Bartmess '04**, who won a prize for best paper in her section at the Tennessee Academy of Science West Tennessee Regional Collegiate Meeting.

Awards for research presentations at Rhodes' Seventh Annual Undergraduate Research Symposium went to **Forrest Busler '02, Christine Dietz '02, Chris Huff '02, Bess Elliot '02** and **Lisa Jain '02**. For more information about these meetings and presentations, see page 3.

.....the Phi Beta Kappa initiates of the class of '02: **Trey Aquadro, Christine Dietz, Annie Glover, Ashley Harmon, Chris Huff, Meghanne Keenan, and Mason Wann**.

.....**Trey Aquadro '02, Forrest Busler '02, Katie Cox '03, Chad Jones '03, and Sandra Scott '03**, who were inducted into the Phi Circle of ODK.

.....**Katie Cox '03, Sarah May '03, Veena Rajanna '03, and Sandra Scott '03** who were recently inducted into the Mortar Board honor society. Additionally, **Katie Cox '03** was named secretary for the coming year.

.....the new officers of Rhodes' chapter of βββ: seniors **Ann Young** (President), **Katie Cox** (Vice-President), **Emily Cunningham** (Secretary), **John Bienvenu** (Treasurer), and **Andi Lynch** (Historian). For more information about βββ, see p. 6.

.....**Samuel Weems '02** for receiving the First-Year Computer Science Award.

.....**Jessie Hunt '02**, recipient of the Rebecca Rish Gay Award for the female athlete of the year.

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

Grants and Fellowships:

Dr. Hill was awarded two impressive grants this year. The first, co-authored with Dr. Loprete, was a research grant of \$560,000 from the National Science Foundation (NSF). This 3-year grant will support interdisciplinary research in fungal genetics. One important outcome of this grant is that Drs. Hill and Loprete have money to fund student research during the next three summers. The second grant, received by Drs. Hill, Loprete, Redfean, and Viano, was part of a 3-year, \$60,000 award from The Merck Company Foundation. This grant has already funded student research this past summer, with more opportunities ahead. For more information about both of these grants and the student research opportunities they provide, please see "Signals and Displays" on pages 5-6.

Dr. Burks received a Faculty Development Enhancement Grant to spend this past summer researching in Denmark at the National Environmental Research Institute. Details of the research project can be found at (<http://kesler.biology.rhodes.edu/burks/denmark.htm>).

Jennifer Riem '03 received an award to spend the summer at Miami University in Ohio as an REU student (Research Experiences for Undergraduates) where she

investigated distributions of small mammals in urban environments.

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

Burks, R.L. and D.M. Lodge. 2002. Cued in: advances and opportunities in freshwater chemical ecology. *Journal of Chemical Ecology*. 28(10): 1881- 897.

Hill, T.W., D.M. Loprete, K.N. Vu '96, S.P. Bayat Mokhtari '87, and L.V. Hardin '00. 2002. Proteolytic release of membrane-bound endo-(1,4)-β-glucanase activity associated with cell wall softening in *Achlya ambisexualis*. *Canadian Journal of Microbiology* 48:93-98.

Meetings:

Dr. C. Jaslow attended the annual meeting of the Society for Integrative and Comparative Biology, in Anaheim, California, January 2-6, 2002. At this meeting, she presented her research, "Early Development of Interdigitation in Rat Cranial Sutures," co-authored with **Brock Lanier '02** and **Erik Hill '01**.

Dr. Miller gave a platform presentation at the SouthEastern Regional Yeast Meeting. Her presentation was entitled, "Distinct Mechanisms for Regulated Localization of G1 Cyclins in *Saccharomyces cerevisiae*." This summer, Dr. Miller also traveled to Salt Lake City, Utah to attend and present a poster at the annual American Society of Microbiology meeting. **Dr. Miller's** poster was entitled "Structure Function Analysis of the G1 Cyclin *CLN2* and *CLN3* of *Saccharomyces cerevisiae*."

Last May, **Dr. Burks** gave an invited plenary address entitled "Littorally Complex: Linkages Between Structural, Chemical, and Behavioural Food Web Interactions in Littoral Zones" at the International Shallow Lakes Meeting in Balatonfured, Hungary. In June, Dr. Burks also presented "Do Littoral and Pelagic Zones 'Smell' Different? Daphnid Behavioral Responses to Chemical Cues from Whole Lake Zones, Macrophytes and Multiple Predators" at a special Habitat Coupling Session at the annual meeting of the American Society for Limnology and Oceanography in Victoria, British Columbia.

Dr. Stinemetz attended the meeting of the American Society of Plant Biologists in August, where he gave two presentations. One, co-authored with **Matt Keogh '03** was entitled "A Mineral Deficiency Symptom Laboratory with *Brassica rapa*." The second presentation, "Fluridone-Treated Pea Roots Lack a Hydrotropic Response," was co-authored with both **Matt Keogh '03** and **Liz Glass '04**.

In March, four Biology majors attended the Tennessee Academy of Science West Tennessee Regional Collegiate Meeting at LeMoyne-Owen College, where they presented their research:

Kimberly Bartmess '04 and Jon McCullers. "Effect of a neuraminidase inhibitor on influenza and pneumococcal synergism. Kimberly won for best paper in her section.

Trey Aquadro '02 and Richard Redfearn. "Isolation and identification of chlorinated pesticide residues from urban soil".

Evgueny Krynetski '02. "Murine model to study cisplatin (CDDP)-induced ototoxicity."

Andi Lynch '03 and Alan Jaslow. "Leg growth and allometry in tarantulas".

The following student presentations were given in April at "Battle of the Minds," Rhodes' 7th Annual Undergraduate Research and Creative Activity Symposium.

Trey Aquadro '02 and Richard Redfearn. "Cypress Creek bioremediation project".

Kimberly Bartmess '04 and Jon McCullers. "The effect of a neuraminidase on the lethal synergism that exists between influenza and pneumococcus".

Forrest Busler '02. "Alternative splicing in scythe, a key regulator of apoptosis". Forrest won first place for his oral presentation.

Marian Butcher '03, "Cloning and expression of the Epstein-Barr virus latency proteins A73 and RPMS1."

Katie Cox '03. "The effect of neuronal interleukin-16 on the spatial learning ability of mice".

Emily Cunningham '03. "The development of a mouse model to study PTEN function in brain".

Christine Dietz '02. "Structural folding to create a functional antibody: an examination of an unstable light chain". Christine won 2nd place for her oral presentation.

Bess Elliot '02 and **Lisa Jain '02.** "Effect of acute endurance exercise on expression of c-Fos protein and 3-nitrotyrosine in the substantia of rat". Bess and Lisa won first place for their poster presentation.

Chris Huff '02. "Asian clam glycogen concentration as a bioassay of Wolf River conditions." Chris won 2nd place for his poster presentation.

Meghanne Keenan '02, Kelly Savage '03, Casey Smolarz '03 and **Rachel Tilley '03.** "The effects of Vasopressin on the autonomic nervous system".

Deependra Mahato '03. "Gene delivery and intracellular trafficking of plasmid DNA (pDNA) using polycations and peptides.

Jessica Skyfield '02. "Littoral versus pelagic resources of *Daphnia*: impacts of size and food quality".

Andrew Seiwell '02. "Macrophyte preference by *Daphnia magna* during Diel Horizontal Migration (DHM)".

-----"

Curricular Evolution: Course Changes and Announcements

If you are interested in the Coral Reef Ecology courses (Biology 252-254), please see Dr. Kesler BE-FORE registration. This year's courses, taught by Drs. Brewer and Kesler, will focus on tropical biology and coral reefs. The trip to Roatan Island will be from May 24-June 7, 2003, and hopefully will include a trip to the mainland and a night's stay in the rainforest. By taking the 2 hours of classes in the spring (Bio 252, 253) and the 2-hour course in May-June, you will receive 4 hours of credit for one upper-level biology course.

Biology majors are invited to take a new 4-credit, upper-level course offered in the department this Spring **Bio. 099 – Wetland Ecology and Policy** – with **Dr. Burks.** Wetland Ecology and Policy is foremost a biology course in which students will spend at least the first

half of the semester discussing the scientific definition and function of wetland habitats. After gaining a scientific understanding of a wetland, students will then delve into the social and political debate that surrounds wetland science. This class will incorporate a variety of learning strategies including lectures, discussions, individual presentations and group projects. Wetland Ecology and Policy meets "M" hour (Tu/Th 9:40-11:10) with Thursday lab which includes several field excursions (Ducks Unlimited, University of Mississippi Field Station, Wapanocca Reserve and local wetland habitats). Email (burksr@rhodes.edu) or see Dr. Burks (FJ-142-E) for a syllabus.



PRE-MED PROGRAM IN UK

Washington and Lee and the University of St. Andrews offer a fall term program for pre-med. students at St. Andrews. Students take the first semester of Organic Chemistry at St. Andrews, designed by W&L and St. Andrews faculty, transcribed as a W&L course by W&L (for AMCAS). Other courses taken are transcribed by St. Andrews. The program includes orientation in London and Edinburgh. For more information, visit the program web site at <http://internationaleducation.wlu.edu/standrews.htm> or

contact program office at wklingel@wlu.edu. This program is pre-approved for Rhodes students and the Organic Chemistry will transfer.

----- .. -----

Signals and Displays (short communications)

TWO RHODES ALUMNI TO GIVE SEMINARS IN OCTOBER!

Friday, Oct. 25, at 3:00pm in FJ-B, distinguished Alumnus, **Dr. Sidney Strickland '68**, Dean of Graduate Students and Vice President for Education at Rockefeller University, will discuss his ongoing research on neurodegenerative disorders, "**Molecules That Control Neuronal Death in the Central Nervous System.**" Afterward, he will discuss summer research opportunities in the sciences at Rockefeller University for undergraduates. If you are interested in this topic, or in an opportunity to do summer research at Rockefeller University, please be sure to attend this talk.

Also in October, **Dr. Lora Hooper '89** will be speaking on her research, "**How normal resident bacteria shape our biology: *in vivo veritas.***" According to Dr. Hooper, "I have been spending most of the past



Dr. Hooper
circa 1985

6 years working on the bacteria that normally live in the intestine. Many of these bacteria are not pathogenic at all, but they actually constitute our major contact with the microbial world. However, nobody really knows anything about how they affect our biology. So I've been using a couple of really cool

technologies to address this question. We are able to raise mice under germ-free conditions. Then I colonize them with one or a few bacterial species that normally live in the gut and ask what kinds of changes occur when the bacteria are added back. 5 years ago we didn't even have the technologies (DNA microarrays, laser capture) to address the question of how normal microbes influence the biology of their hosts, so its really awesome to be able to take such a basic question and finally have the means to tackle it."

Dr. Hooper is currently a Postdoctoral Fellow in the Department of Molecular

Biology and Pharmacology at the Washington University School of Medicine. Her presentation, sponsored with support from the Merck/AAAS program, will begin at 4:15 in FJ-B on Monday, Oct. 28. Refreshments will be served in the Biology Library at 4:00.

HELLO FROM OUR NEWEST FACULTY MEMBER

If you have seen a man in field clothes walking by carrying large bundles of foliage, you have spotted our newest faculty member, Dr. Steven Brewer. Dr. Brewer is currently teaching the upper-level course, Survey of the Plant Kingdom, along with Environmental Science for nonmajors. Next semester he will be teaching a Bio II



Dr. Brewer

introductory lab and a senior seminar in Environmental Biology. Dr. Brewer describes his interests in biology, "Most of what I have learned in life has been outside of the classroom, but I view academics as a way of pursuing what I think of as "fun", which consists of connecting with and learning from the 'natural world.' My interests, for better or worse, are extremely broad; I enjoy taking the opportunity to explore everything from the minutia of a tiny weed in a sidewalk crack to watching how rivers engulf forests in torrential, tropical rains. I have lived in many places, including a recent year in France and South America, but I have a deep appreciation of

Optimal Foraging

The following courses will be offered next semester

NUMBER	COURSE TITLE	HOURS OFFERED
140	Biology II	A, C, or L lectures
099	Wetland Ecology & Policy	M lecture; Thurs lab
200	Evolution	A lecture
201	Mycology	B lecture; Wed lab
202	Vertebrate Life	M lecture
204	Mech's of Development	C lecture; Fri lab
207	Animal Behavior	N lecture; Tues lab
252	Coral Reef Ecology (lit.)	TBA
253	Coral Reef Ecology	Mon 3-4pm
304	Genetics	B lecture; Wed lab
370	Neuroscience	N lecture; Mon lab
486(1)	Sr. Sem. Cancer Biology	T, Th 4:00-5:30
486(2)	Sr.Sem. Environ Biology	L

the Southeast, in which I was raised. My research has focused on plant-animal interactions and on discovering, describing, and explaining broad-scale patterns of plant diversity. I particularly enjoy working in forests, for reasons I have yet to decipher. I have experience working with mammals, even though I am primarily a plant ecologist, so I expect that my future research will have some plant-mammal component to it.

My experience at Rhodes so far (only a few months) has been a pleasant surprise. I am impressed with the confidence and motivation of the students here. These are some of the key ingredients for self-learning and discovery, which form the foundation of my teaching philosophy. I prefer to act as a guide, rather than just a giver of information. I also believe that learning in the field or lab is essential for students to 'get' science, for you can never truly know what you read until you have tried something like it."

RESEARCH, RESEARCH, AND MORE RE-SEARCH OPPORTUNITIES!!!

If you are interested in doing research, you should speak to any of the Biology professors about what they are doing. In addition, there are summer research opportunities at Rockefeller University (described above under Dr. Strickland's seminar announcement), and other exciting opportunities now available here at Rhodes thanks to two major grants. Keep reading to find out more about them

Merck/AAAS Grant for Undergraduate Research

During the summer of 2002, four Rhodes undergraduates worked with faculty members in Biology, Chemistry, and Physics on interdisciplinary research projects bridging the interface between biology and chemistry. Carl Carlson '04, and seniors **Tim Hoggard**, **Mario Maruthur**, and Karyn Spence, were recipients of \$3000 Merck/AAAS Research Fellowships, supporting their participation in research projects directed by Professors Hill, Loprete, Redfearn, and Viano.

This research was funded by The Merck Company Foundation, which recently awarded Rhodes College \$60,000 to use over a 3-year period to support undergraduate participation in two research projects: 1) "Molecular-Biological Analysis of Fungal Cell Wall Metabolism" (directed by Drs. Hill and Loprete), and 2) "Characterization of Crosslinked Ultrahigh Molecular Weight Polyethylene" (directed by Drs. Redfearn and Viano). Rhodes College was one of only 15 colleges or universities in the country to receive funding in the 2002 competition, which was administered by the American Association for the Advancement of Science (AAAS).

The research activities of Carl, Tim, Mario, and Karyn, as well as information about the two funded research projects and other aspects of the Merck/AAAS program can be found at the following web site: <http://hill.biology.rhodes.edu/hill/merck/merck.html>.

Students interested in participating in future Merck/AAAS-funded research are encouraged to visit the program web site and to talk to the professors who are directing the project of interest. Fellowships to participate in the Crosslinked Polyethylene project will be awarded for work to take place during the summer of 2003. Support for participation in the Fungal Cell Wall Metabolism project will be available to students working during this upcoming Spring Semester. (The Cell Wall project also has summer fellowship support available under a separate grant from NSF – see below).

Fellowship support during the academic year comes with a stipend. Since students cannot receive both academic credit and a salary for the same work, those interested in working on this project in this coming Spring Semester should contact Dr. Hill before registration to discuss the project expectations and to decide how best to fit research into their schedule (either as BIO-452 for credit or as a salaried fellowship, whose responsibilities are in addition to a normal course load.)

National Science Foundation Grant Research Opportunities for Undergraduates

Beginning in January 2003, the research program of Drs. Hill and Loprete will be funded by the National Science Foundation (NSF) to the tune of \$560,000 over a three-year period. The funding will support interdisciplinary research in fungal genetics, aimed at a better understanding of the synthesis and development of the fungal cell wall. Cell walls are an important target of antifungal drugs used for treating the increasingly large number of cases of opportunistic fungal infection among persons compromised immunity.

In addition to funding the purchase of several new pieces of research equipment and covering the high costs of molecular biological research, the grant also provides funds to hire a postdoctoral research specialist, who will work with Drs. Hill and Loprete on the project. This funding represents a major investment by NSF in research in the sciences at Rhodes College.

Of particular interest to Rhodes students is the provision in the grant for fellowships to support the participation of three undergraduate researchers in each of the three summers of the funding period. The stipends are \$4,000 per summer for 10 weeks of involvement in research. In addition, there is funding to support student travel to scientific meetings and for visits to our

collaborating laboratory at the University of Georgia, where some of the work will be performed.

Applications for NSF summer research fellowships will be solicited during Spring Semester. However it is not too early for students who expect to apply for these positions to be thinking about starting work on this research project. Students who have already been working with success in this laboratory will naturally have an advantage in their applications for summer support.

Students interested in learning more about the nature of the research funded by NSF and about what is expected of students working on the project should visit Dr. Hill's research web page at <http://hill.biology.rhodes.edu/hill/Studentresearch.html>. Then contact Dr. Hill to talk more about the research and to find out if there is room for you to join the project during Spring Semester. Students who work in the lab during Spring Semester have the option of enrolling in BIO-452 for academic credit or of receiving an academic-year stipend under the Merck/AAAS Undergraduate Research Program (see above).

St. Jude research program going strong

Applications for next year's Summer Plus Research Program will be available in late January. Keep a lookout for notices or e-mails informing you of the details. For additional information, contact Dr. Blundon or see <http://blundon.biology.rhodes.edu/sjresearch.htm>

TRI-BETA

The date of the fall initiation for the Tri Beta (βββ) Biological Honor Society will be Wednesday, November 6 at 8:00 PM. Students interested in associate membership should contact Emily Cunningham at

----- .. -----

Cover page figures:

At left: Parasitic fungi use hyphae called haustoria to penetrate the cells of a host plant. Fig. 31.2 from Campbell, N.A. and J.B. Reece. 2002. *Biology*. 6th ed. New York: Benjamin Cummings.

At right: Distinguishing characteristics of a silverbell-tree, *Halesia carolina*. Plate 67 from Petrides, G.A. 1972. *A field guides to trees and shrubs*. 2nd ed. New York: Houghton Mifflin Co.

cunej@rhodes.edu. An invitation will be extended to students meeting the requirements for regular membership. Requirements for associate membership are 1) the completion of at least one biology course at Rhodes with an overall 'B' average and 2) a \$20 initiation fee, which may count later towards regular membership.

Officers for the 2002-2003 school year are as follows:

President: **Ann Young '03**
Vice-President: **Katie Cox '03**
Secretary: **Emily Cunningham '03**
Treasurer: **John Bienvenu '03**
Historian: **Andi Lynch '02**

Tri Beta will also be sponsoring a lecture series for student research opportunities. Details will be posted on the βββ bulletin board. This should be an exciting year for Tri Beta, as we will be co-hosting the annual Biology Department Halloween Party and sponsoring a "Name the Dinosaur" Fundraiser in November.

BIOLOGY RESEARCH AWARD

Each spring, the Biology Department honors a student with its **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 five to seven page research paper, plus a recommendation from the research supervisor. If you are interested in submitting your work for this prize, please speak to your advisor or to **Dr. Miller**. The deadline for applications for this Research Award will be announced in the spring issue of Biofeedback.