



BIOFEEDBACK

The Newsletter of the Biology Department at Rhodes

Volume 16

7 March 2002

Number 2

The purpose of *BIOFEEDBACK* is to provide an important and timely vehicle for the transfer 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 February of this year, students and faculty reflected on how we interact with each other and how these interactions influence the learning climate both on the campus and in the department. On February 21st, Drs. Kesler, C. Jaslow, Burks and Stinemetz hosted two 1 hour sessions with Biology majors to discuss the classroom climate in Biology. These discussions principally centered around classroom activities and student/faculty interactions. Some of the many good ideas that came from these discussions included: 1) creation of a student faculty liaison, 2) a need for an informal gathering area, and 3) a more student-friendly suggestion device. During this and the next semester the faculty will be discussing these ideas and I hope to implement some of them. We have already received permission and funds to create a small lounge area around the dinosaur with the hope that this will encourage more informal interactions between students and faculty. Let me stress that I, and the other faculty in the department, are always willing to hear your concerns and suggestions for improving how we work together.

Faculty in the department have worked diligently to refine curriculum offerings and increase student opportunities both during the academic year and summer. To date, the most notable change in the curriculum is the conversion of our introductory course offerings from Botany and Zoology to Biology I (topics ranging from Cell Biochemistry to Genetics) and Biology II (topics from animal/plant anatomy and physiology to Ecology/Evolution). Perhaps less apparent are

some changes focusing on improving information fluency in courses. This work has been sponsored through funds awarded to Dr. Lindquester from the Associated Colleges of the South. We are also adding new instrumentation (neuroscience equipment and DNA sequencer) acquired with funds from National Science Foundation grants. Finally, there will be increased opportunities for student summer research through the continuation of the St. Jude Summer Plus Program, Merck funded interdisciplinary studies with Dr. Hill, a Council on Undergraduate Research Fellow with Dr. Miller, and several opportunities to work with faculty funded through the college faculty development program. I hope that all of these initiatives will help make our department a more vibrant learning environment.



--- 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 16, 2001.

Honors and Awards:

CONGRATULATIONS TO ...

.....**Matt Keogh '03**, who won the award for Best Undergraduate Poster at the southern regional meeting of the American Society of Plant Biologists. For information about Matt's poster and other presentations and publications of students and faculty, see page 2.



Grants and Fellowships:

Drs. **Terry Hill**, Darlene Loprete, Richard Redfean, and Ann Viano were awarded a \$60,000 grant from the Merck Company Foundation and the American Association for the Advancement of Science to fund full-time summer research fellowships for Rhodes students.

In February, **Dr. Lindquister** received a grant of \$52,165 from the National Science Foundation, with matching funds from Rhodes and the Plough and Assisi Foundations, to support teaching Bioinformatics through the Lynx Genome Project, NSF CCLI-A&I proposal. Dr. Lindquister also received a grant of \$4,844 for the Integration of Information Fluency into a Two-Semester Introductory Biology Laboratory Series. This Information Fluency Grant was awarded by the Associated Colleges of the South.

Dr. Stinemetz received two grants to support the summer Young Scholars Program for high school students. The funding agencies were the Assisi Foundation (\$35,000) and the Plough Foundation (\$35,000). These funds not only contribute to the community outreach efforts of our department and the college, but also support the purchase of equipment and supplies used during the academic year.

The Council on Undergraduate Research 2002 Summer Fellowship was awarded to **Dr. Mary Miller**. This grant will support the research of **Alison Groeger '04** this summer as she continues her independent research project in Dr. Miller's lab on the characterization of functional domains of the G1 cyclin *CLN2* in *Saccharomyces cerevisiae*.

Dr. Kesler, with Dr. M Kirby, received a Hill Mellon Grant of \$5,000 from Rhodes for "Disseminating Geographic Information Systems (GIS)."

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

Burks, R.L., E.J. Jeppesen, & D.M. Lodge. 2001. Pelagic prey and benthic predators: impact of odonate predation on *Daphnia*. *Journal of the North American Benthological Society* 20(4): 615-628.

Burks, R.L., N.C. Tuchman, C.A. Call, & J.E. Marsden. 2002. Colonial aggregates: effects of spatial position on zebra mussel responses to vertical gradients in interstitial water quality. *Journal of the North American Benthological Society* 21(1): 64-75.

Burks, R.L., D.M. Lodge, E. Jeppesen, and T.L. Lauridsen. 2002. Diel horizontal migration of zooplankton: costs and benefits of inhabiting the littoral. *Freshwater Biology* 47:1-23.

Anthony, J.L., **D.H. Kesler**, W.L. Downing & J.A. Downing. 2001. Length-specific growth rates in freshwater mussels (*Bivalvia*: Unionidae): extreme longevity or generalized growth cessation? *Freshwater Biology*. 46:1349-1359.

Cross, F., V. Archambault, **M. Miller**, & M. Klovstad. 2002. Testing a Mathematical Model of the Yeast Cell Cycle. *Molecular Biology of the Cell*. 13(1): 52-70.

Meetings:

Dr. Burks was an invited participant in the DIALOG IV Meetings (Dissertation Initiative for the Advancement of Limnology and Oceanography) in Bermuda where she gave both an oral and a poster presentation about her research interests.

Kimberly Bartmess '04 presented her research on "Use of oseltamivir to prevent lethal synergy between influenza virus and *Streptococcus pneumoniae*" at the Southern Regional Meeting of Southern Society of Pediatric Research in New Orleans, LA.

In November, **Dr. Kesler** attended the joint meeting of the Tennessee-Kentucky Academies of Science, held in Murfreesboro, TN. There he presented two posters: "Growth of the freshwater mussel, *Pyganodon grandis*, in two west Tennessee borrow pits," which was coauthored with N. Van Tol, and "Mussels of the Wolf River, TN & MS."

Dr. Lindquister gave a presentation entitled "Fostering information fluency in the introductory biology laboratory" at the Third Symposium of the Associated Colleges of the South Information Fluency Project: Towards Information Fluency in the Liberal Arts, Atlanta, GA, February, 2002. He also coordinated the poster session at the above meeting.

Matt Keogh '03 and **Dr. Stinemetz** presented a poster at the annual southern regional meeting of the American Society of Plant Biologists on the campus of the University of Georgia. The title of the poster was "Localization of amyloplasts in the distal elongation zone of *Zea mays* roots."

In January, **Dr. C. Jaslow** traveled to Anaheim, CA, for the annual meeting of the Society for Integrative and Comparative Biology. There she presented a research poster, "Early development of interdigitation in rat cranial sutures," coauthored with **Brock Lanier '02** and **Erik Hill '01**.

Curricular Evolution:

Course Changes and Announcements

SENIOR SEMINAR LOTTERY Thursday March 14th

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 the number allowed is limited by how many students wish to enroll from other majors. The deadline for giving your name to Dr. Blundon is Tuesday, March 12, at 5 pm. **Students who wish to enroll in one of the other four seminars may do so via lottery to be held in the Biology Library at 12:15 on Thursday, March 14.** 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): The format of **Dr. Kesler's** fall senior seminar course "**Limnology**" will be lecture, student presentation, and laboratory. The course will focus on lakes and rivers as systems and their biological, chemical, physical, and geological aspects. This course will meet Tuesdays and Thursdays from 4:00-5:30 PM, and students in the course are required to participate in weekend-long field experiences.



Bio. 485(2): **Dr. C. Jaslow's** fall senior seminar is entitled "**Reproductive Biology**," and it will meet at N 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 485(1): **Dr. Jay Blundon**, along with **Drs. Robert Strandburg, Darlene Loprete, and Ann Viano** will offer an interdisciplinary senior seminar open to seniors in the departments of Biology, Psychology, Chemistry, and Physics. The title of the course will be "**Interdisciplinary Approaches to Cancer Research and Treatment**".



Guest lecturers from St. Jude Children's Research Hospital will deliver weekly seminars about their latest research. Prior to each guest presentation, a student will preview the guest's topic, providing the class with background information and a preview of the research to be presented by the St. Jude faculty member. Some of the topics scheduled include the use of animal models in human cancer, signal transduction pathways in cell development and apoptosis in normal and tumor cells, mechanisms of cell cycle regulation, radiation therapy in pediatric oncology, and structural biology of cell proteins involved in tumor genesis. This senior seminar will be offered to 89 Rhodes students in the four departments. It will be held on Tuesdays and Thursdays from 4:15 – 5:45 PM. **Biology seniors interested in participating must contact Dr. Blundon prior to March 13th.** This course completely satisfies the Biology Department senior seminar requirement. Students in Psychology, Chemistry and Physics should contact their advisors to determine to what extent the course satisfies the senior seminar requirement in their department. Note that this seminar is listed under department number 42 for interdisciplinary courses.

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 H hour.



Bio. 486 (2) (spring senior seminar): The new Environmental Science faculty member will offer a section on this topic. This class will meet Tuesdays and Thursdays from 4:00-5:30.



Comparative Vertebrate Morphology (Bio-350) 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 1-4 pm. The second meeting each week is for one hour minimum on Friday starting at either 1 or 2 pm. This will allow students to enroll in an E or F hour class during the short add/drop period following registration. Two additional hours of lab are required, but these may be done at other times of the week. (Please note the current Banner program will not allow students to register for both Bio-350 and a E or F hour class using the tree program.) See Dr. A. Jaslow if you have any questions.

With Dr. Lindquister on sabbatical next year, **Molecular Biology (Bio 325)** will not be offered in the fall. However, it is tentatively scheduled to be taught in the spring term instead of Virology/Immunology (Bio 330) by our new faculty member in molecular/development.

For information and syllabi for courses offered by the Biology Department, check out the Biology Department local home page. This is accessible either through the Rhodes home page or via:

<http://kesler.biology.rhodes.edu/biol.html>

Signals and Displays (SHORT COMMUNICATIONS)

NEW SUMMER RESEARCH OPPORTUNITIES

A \$60,00 grant from the Merck Company Foundation and the American Association for the Advancement of Science has been awarded to the departments of Biology, Chemistry, and Physics to fund full-time summer research fellowships for Rhodes Students. Rhodes is one of 15 colleges and universities to be funded in the 2002 Merck/AAAS Undergraduate Science Research Program. The goal of the program is to promote the involvement of undergraduate students in interdisciplinary research in areas bridging the interface between chemistry and the biological sciences.

Research funds are provided for four students to do research during each of the next three summers, for a total of twelve awards. Each fellowship position carries a \$3000 stipend and is accompanied by \$1250 towards research expenses.

The fellowships are tied to two interdisciplinary research projects being conducted by Drs. Hill, Loprete, Redfearn, and Viano. Students working with Dr. Hill and Dr. Loprete will investigate the genetic basis of fungal growth, using techniques of cell and molecular biology. The project of Dr. Viano and Dr. Redfearn investigates the chemical and physical properties of materials used in forming artificial joints.

Students interested in applying for one of the four research fellowships that will be awarded for work this summer should contact one of these four professors for more information about the research projects and about the mechanism for making application. Brief descriptions of these projects, as proposed to Merck/AAAS, are also available on-line at <http://hill.biology.rhodes.edu/hill/merck.html>.

In addition to funding summer research positions, this award also provides funds to bring in speakers during the next three academic years. The Merck Distinguished Speaker Series will endeavor to address a wide range of ways in which biological and chemical interests intersect, ranging from biomedical to ecological topics. Further funds are provided to allow the departments to bring to campus graduate students and young scientists at the start of their research careers, to talk with Rhodes students who are interested in learning more about science as a career.

SUMMER RESEARCH ASSISTANT IN BIOLOGY WANTED

Rhodes has received a grant for the National Science Foundation to initiate the Lynx Genome Project. **Dr. Lindquister** is looking for an assistant to develop protocols for DNA preparation, sequencing and analysis using a new automated sequencer and to establish a Web site for the project. The position carries a stipend for ten weeks of full time work. Campus housing may be available for a nominal cost. Training will be provided. Start and end dates are negotiable, but applicants must be able to work throughout the month of July. Experience in molecular biology techniques is desirable but not required. Interested students should contact Dr. Lindquister at x3564 or glindquister@rhodes.edu by April 1, 2002.

The **Biology Department** is looking for students who would like to work in the department next year as **laboratory assistants**. If you are interested, please speak to Ms. Christian Hardin (x3561, FJ 127w).

BIOLOGY SEMINAR NEWS

TRI-BETA NEWS

This spring, we have seen a flurry of seminars, starting off with Dr. Blundon's presentation of his research on multifunction proteins in the brain. We then journeyed from the ATP activated ion channels of guinea pig gall bladder epithelial cells, to the forest floor of Belize, with intriguing seminars by a series of candidates for the two faculty positions in the department next year. Our thanks to all of you who attended these job seminars and gave us your thoughts about the candidates. Our next (and last) scheduled seminar is coming up quickly. On Monday, March 25, Dr. Gail Stratton from the University of



Dr. Stratton

Mississippi will be presenting her research on spider behavior. Dr. Stratton's seminar, entitled "Walking on water: the evolution of neustonic locomotion in spiders," will begin in FJ-B at 4:15. Refreshments, and an opportunity to meet Dr. Stratton, will be available in the Biology Library at 4:00.

Beta Beta Beta (bbb) is the biological honor society for the Rhodes Biology Department. $\beta\beta\beta$ 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. 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. It also provides a forum to recognize those students, with biology as their undergraduate major, who excel academically.

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

continued next page...

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 Friday, March 29. Copies of the recommendation form may be obtained from Dr. C. Jaslow. Announcement of the award winner will be made at spring awards ceremony.

TAS Meeting Coming March 23rd

The Collegiate Division of the Tennessee Academy of Science will be meeting on March 23, 2002 at Lemoyne Owen College in Memphis. Undergraduate students from our area will give oral presentations about their research. If you think you would like to do research and/or if you want to see what student research involves please plan on going. The students presenting will appreciate your attendance. You can contact Dr. Kesler if you have any questions or go to the Collegiate Division on the TAS web page (<http://tas.rhodes.edu/tas.htm>).

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
200	Evolution	A
301	Microbiology	C and U
307	Cell Biology	M
310	Methods in Biochem & Cell	S
315	Ecology	B and R
340	Animal Physiology	M and Q (1-5pm)
350	Comp. Vert. Morph.	B, R and U
360	Histology	A and S
451	Research in Biology	TBA
460	Biology Internship	TBA
485(1)	Limnology	T,Th 4:00-5:30
485(2)	Reproductive Biology	N
42 485(1)	Interdisciplinary (St. Jude)	Tu,Th 4:15-5:45
FOR NON-MAJORS		
105(1)	Environmental Science	C and Q
105(2)	Biology of the Mind	O

Regular Membership:

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

Please note that $\beta\beta\beta$ initiation will be April 4th and that there will be a picnic at Dr. Kesler's home on April 18th where officers' elections will take place. The $\beta\beta\beta$ bulletin board across from the Biology office has updates on current activities. If you have any questions, or are interested in initiating this spring, please contact Ellen Barton (email: BAREH) or Allison Gratzner (email: GRAAL).

◆

Student Research 2001-02 sponsored by Programs at Rhodes

Kimberly Bartmess '04. *Investigation of the lethal synergism between influenza virus and Streptococcus pneumoniae.* Bio 451 & 452 with Dr. Jon McCullers of St. Jude Children's Research Hospital.

Amy Birch '02. *Initiation of the Lynx Genome Project.* Bio 451 & 452 with Dr. Gary Lindquister.

Katie Cox '03. *The effects of neuronal interleukin-16 (NIL-16) deletion on learning and memory in mice.* Bio 451 & 452 with Dr. Jay Blundon.

Liz Glass '04. *Analysis of ABA levels in fluridone-treated and fluridone-recovered pea plants.* Bio 451 & 452 with Dr. Chuck Stinemetz.

Alison Groeger '04. *Functional characterization of the G1 cyclin CLN2 hydrophobic patch domain in Saccharomyces cerevisiae.* Bio 452 with Dr. Mary Miller.

Chris Huff '04. *Asian clam (Corbicula fluminea) glycogen concentrations in the Wolf River.* Bio 452 with Dr. David Kesler.

Matt Keogh '03. *The effect of fluridone on the hydrotropic response of pea roots.* Bio 451 with Dr. Chuck Stinemetz.

Axel LaForest '04. *Patterns of dominance and recessiveness in four mutant genes of Aspergillus nidulans, conferring hypersensitivity to Calcofluor.* Bio 452 with Dr. Terry Hill.

Kathy Llewellyn '02. *Influence of plant and odonate chemical cues on Daphnia growth and reproduction.* Bio 451 with Dr. Romi Burks.

Andi Lynch '03. *Leg growth and allometry in tarantulas.* Bio 451 & 452 with Dr. Alan Jaslow.

Jennifer Riem '03. *Subcellular localization of the G1 cyclin CLN1 in Saccharomyces cerevisiae.* Bio 451 & 452 with Dr. Mary Miller.

Andrew Seiwel '02. *Can Daphnia distinguish between multiple chemical cues?* Bio 451 with Dr. Romi Burks.

Jessica Skyfield '02. *Littoral and pelagic food quality and size effects on Daphnia growth and reproduction.* Bio 451 & 452 with Dr. Romi Burks.

Chris Tolleson '02. *Impact of multiple predators on Daphnia mortality and behavior.* Bio 451 & 452 with Dr. Romi Burks.

Samuel Weems '02. *Patterns of dominance and recessiveness in four mutant genes of Aspergillus nidulans, conferring hypersensitivity to Calcofluor.* Bio 452 with Dr. Terry Hill.

Samuel Weems '02. *Role of extrinsic forces during initiation of interdigitation in rat cranial sutures.* Bio 452 with Dr. Carolyn Jaslow.

Ann Young '03. *Automated sound analysis and recording.* Bio 451 & 452 with Dr. Alan Jaslow.

◆

Cover Page Figures:

At left: *Medullosa*, a Carboniferous seed fern. From Delevoryas, T. 1962. *Morphology and evolution of fossil plants*. New York: Holt, Rinehart, Winston; as printed on p. 83 of Futuyma, D.J. 1979. *Evolution*. Sunderland, MA: Sinauer Associates, Inc.

At right: Wood frog (*Rana sylvatica*) tadpole. Fig. 40 from Stebbins, R.C. 1985. *A field guide to western reptiles and amphibians*. 2nd ed. New York: Houghton Mifflin Co.