



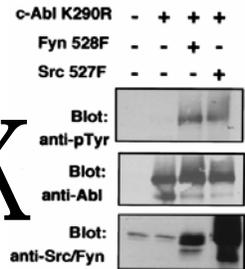
BIOFEEDBACK

The Newsletter of the Biology Department at Rhodes

Volume 19

22 October 2004

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.



The Chair's Niche:

Reflection – What does that word mean to you? As the department chair it is my responsibility to periodically reevaluate with the faculty where our program is headed and gauge our progress toward achieving our goals. One of our paramount goals is offering our students as engaging an educational experience as possible. The intellect, creativity, and time of faculty are often severely tested in these efforts. However, I am very pleased to report that there is strong evidence that we are continuing to move forward in offering students unique and challenging opportunities (as demonstrated elsewhere in this newsletter). At a career services meeting, I was recently told that Rhodes biology majors in the 2003 class contributed to a 95% acceptance rate to medical school, 100% acceptance to biology graduate programs, and the majority of the remainder of the class was either gainfully employed or pursued graduate studies outside of the sciences. Somebody once said “The proof is in the pudding” and our pudding tastes very sweet. These sorts of success stories do not come about by accident. Rather they are the result of hard work and effort by both faculty and students.

Now I want to challenge you to reflect upon your educational experience. Students sometimes take the path of least resistance when selecting courses or deciding if special opportunities (research, study abroad, summer experiences) are worth their energy and time. I want to encourage all of you to think broadly about your academic interests and challenge yourself to exceed the minimal expectations in your classes. If you adopt these attitudes, I am certain that you and our department will continue to reap the rewards of that sweet pudding.

---- 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, 2004.

Honors and Awards:

CONGRATULATIONS TO ...

.....**Natalie DuMont '04**, who won the Award for Excellence in Biology for the '03-'04 academic year. Additionally, **Kimberly Bartmess '04** was received the Award for Outstanding Student Research in Biology. Finally, **Adam Bohnert '07** and **Matthew Cain '07** were co-recipients of the Award for Excellence in First Year Biology.

.....**Kristy Kummerow '04** who received the Robert Wolcott Memorial Award in recognition of her service to the poor and homeless.

.....**Bethany Drehman '06**, who was awarded the Barry M. Goldwater Scholarship. This scholarship, established by Congress in 1986, awards \$7,500 to highly qualified undergraduates in the sciences, mathematics, and engineering. The Goldwater Scholarship competition is highly competitive – in 2004, only 310 Goldwater Scholars were named nationwide. Rhodes has had only two recipients before Bethany.

.....**Christine Bass '06**, who was awarded the Kristen and Vernon Hurst Scholarship for British Studies.

.....**Kristy Kummerow '04** and **Alexi Matousek '04** who were elected to the Rhodes Hall of Fame.

.....the Phi Beta Kappa initiates of the class of '04: **Natalie DuMont '04**, **Liz Glass '04**, **Emily Furlow '05**, **Chip Hartigan '05**, **Kristy Kummerow '04**, **Michael Lyerly '04**, and **Amir Paydar '04**.

.....**Aditya Bagrodia '04**, **Laura Borg '04**, **Stephanie Gong '05**, **Alison Groeger '04**, **Chip Hartigan '05**, **Hennessy Howell '05**, **Jodi Little '05**, **Austin Lutz '05**, **Alexi Matousek '04**, **Elaine Odle '04**, and **Taylor Whaley '05**, who were inducted into ODK. **Jodi Little** was also elected president.

.....**Sandra Culpepper '04**, whose presentation, “New chemotherapy treatment for retinoblastoma,” coauthored with Dr. Michael Dyer (St. Jude) and **Dr. Jay Blundon** won 1st place at the Tennessee Academy of

Science (TAS) meeting and 2nd place at Rhodes' Undergraduate Research and Creative Activity Symposium (URCAS) this spring.

.....**Katie Jameson '05**, who won 1st place at the URCAS for her poster presentation, "High copy suppression analysis of mis-localized G1 cyclin *CLN3* in the budding yeast *Saccharomyces cerevisiae*," coauthored with **Dr. Mary Miller**.

.....the new officers of Rhodes' chapter of $\beta\beta\beta$: **Carolyn Westfall '05** (President), **Katie Jameson '05** (Vice-President), **Heidi Rademacher '05** (Secretary), **Julie Bishop '05** (Treasurer), and **Desiree Steimer '05** (Historian). For more information about $\beta\beta\beta$, see p. 6.

Grants and Fellowships:

Joe Vaughan '05 and **Jonathan Berger '05** were awarded Summer Biodiversity Fellowships by the Memphis Zoo. **Moss Driscoll '05** was awarded a Fellowship for this fall. Also this summer, **Thayer Hutcheson '05** mentored 5 Snowden middle school students at the zoo. Students participated in research projects at the zoo and got a in depth introduction to research being done at the zoo. This program was developed and run by Dr. Alan Jaslow and was part of the Rhodes Learning corridor program initiative.

The TN Dept. of Agriculture, Division of Forestry, awarded an Urban Forestry Grant (\$10,000) to **Dr. Tony Becker**, Director of the Rhodes Learning Corridor (RLC), to develop a comprehensive management program for invasive exotic vegetation in the Old Forest area of Overton Park. This project is just one component of the RLC, a community-outreach initiative to develop collaborative relationships with other groups to improve science teaching and learning in the Memphis City Schools. This project is a collaborative effort between Rhodes and Park Friends, Inc. (a non-profit group dedicated to preserving Memphis parks), and it will involve students from Central H.S. The Old Forest is designated as a Tennessee Dedicated Level I Arboretum. It is of such significance that its existence led to the re-routing of Interstate Highway 40. The valuable old growth trees in the forest are threatened by the presence of invasive exotic vegetation, including kudzu, Japanese privet and honeysuckle.

The proposed work will include an inventory of invasive exotic vegetation; GPS/GIS mapping of the identified species; development of materials on identification and elimination techniques for training volunteers; volunteer training; and plant elimination. **Dr. John Olsen** and a Biology student will undertake the identification work. **Dr. David Kesler** and a student will conduct the GPS/GIS mapping component. Mr. Glenn Cox, the president of Park Friends, and other members of the board of directors, Dr. Fred Hoffer, and Dr. David Kesler, will develop the training materials. **Drs. Chuck**

Stinemetz and **Rosanna Cappellato** will recruit volunteers and implement the training program, and Dr. Becker will have general administrative oversight. Volunteers will be recruited from $\beta\beta\beta$ and Campus Green at Rhodes; and the student body of Central H.S.

Teams of ten volunteers, directed by one of the faculty or board members, will each be assigned to a specific species, since the elimination procedures differ for the various species. For example, kudzu (*Pueraria lobata*) will be sprayed monthly, during its growing season, with an herbicide specific for plants in its family. On the other hand, plants such as privet (*Ligustrum vulgare*, *L. sinense*, and *L. japonicum*) are best removed by pulling or digging. These teams will be assigned to specific areas identified by the initial survey, and located by the GPS/GIS mapping. Subsequent GPS/GIS mapping will be conducted to identify areas in which vegetation elimination has been completed.

Dr. Mary Miller and **Katie Jameson '05** received a fellowship from the American Society for Microbiology to support Katie's summer research in Dr. Miller's lab. This award paid Katie a stipend for the summer, and will support her attendance at the National American Society for Microbiology Meeting next summer.

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

Fenster CP, Darley-USmar VM, Hunter GR, Landar AL, Patel RP, Weinsier RL. 2004. Plasma nitrate, nitrite and protein 3-nitrotyrosine: associations with weight loss and physical activity. *Free Rad Bio Med* 37: 695-702.

Kesler, D.H. 2004. Influence of a lentic area on the condition indices of *Corbicula fluminea* in the Wolf River, Tennessee. *J. Freshwater Ecol.*19:445-453.

Meetings:

This summer, **Dr. Mary Miller** attended the Cell Cycle Meeting held at Cold Spring Harbor Laboratories, NY and presented her research at the International Yeast Genetics and Molecular Biology Meeting in Seattle, Washington. The poster presentation was entitled "Structure function analysis of the G1 cyclin *Cln3* in *Saccharomyces cerevisiae*" by **Dr. Mary E. Miller**, **Alison Gregor '04** and Dr. Fred Cross. Dr. Miller was also an invited speaker for the symposium on education at this meeting, addressing the audience about "Budding Yeast and the Control of Cell Division as Tools in the Teaching Laboratory". **Katie Jameson '05** joined Dr. Miller at this meeting, and presented a poster of their work entitled, "High copy suppression analysis of mis-localized G1 cyclin *Cln3* in the budding yeast *Saccharomyces cerevisiae*." Katie also presented her poster at the National Council for Undergraduate Re-

search Meeting in Indianapolis, IN, at the Tennessee Academy of Sciences Meeting, held in Memphis, and URCAS (where she was awarded first place for outstanding poster presentation in the natural and social sciences).

Drs. Terry Hill and Darlene Loprete attended a conference on fungal biology in Copenhagen, Denmark and in July they traveled to Asheville NC for the Mycological Society of America Annual Meeting. There, they presented, "Complementation of Calcofluor hypersensitivity in an *Aspergillus nidulans* mutant by a gene coding for a putative O-glycosylated transmembrane protein." Three students traveled with them to the Asheville meeting: **Lauren Fay '05**, Stanley Vance '05, and **Caroline Sartain '07**. Lauren, Stanley, and Caroline presented the following posters of research they carried out during the summer while holding National Science Foundation fellowships to work in the joint laboratory of Drs. Hill and Loprete:

Lauren Fay '05, Terry Hill, and Darlene Loprete. Identification of a gene affecting branching and septal placement in *Aspergillus nidulans*.

Caroline Sartain '07, Stanley Vance, **Lauren Fay '05**, Drs. M. Loprete, and **Terry Hill**. Morphological characterization of a Calcofluor hypersensitive mutant of *Aspergillus nidulans* showing increased density of branches and septa.

Bethany Drehman '06 gave a presentation, "Unlocking the secrets of aardvark and giant anteater reproduction," at the Memphis Zoo on April 2, 2004.

The following students presented their independent research in April at Rhodes' Undergraduate Research and Creative Activity Symposium.

Kimberly Bartmess '04, Jon McCullers (St. Jude), and Terry Hill. "The effect of glycosylation in the virulence of influenza A (H3N2) viruses."

Andrew Burk '04, Jeff Sample (St. Jude), and Gary Lindquister. "Mechanisms of immune evasion: development of murine gammaherpesvirus as a model for human Epstein Barr virus infection."

Kristin Campbell '05, Jeff Sample (St. Jude) and Gary Lindquister. "Generation of recombinant murine herpesviruses."

Reena Chacko '05, Makiko Watanabe, Himagi Jayakar, Mike Whitt (UT), and Jay Blundon. "Human IL-13 cloning into pBSSK vector."

Sandra Culpepper '04, Michael Dyer (St. Jude), and Jay Blundon. Development of new chemotherapy treatment for retinoblastoma. Sandra won 2nd place for her oral presentation.

Karen Dobyns '05, Jay Blundon and Cate Fenster. "Using an eight-arm radial maze to study learning and memory in mice lacking interleukin-16."

Lisa Harsch '05, Terry Hill and Darlene Loprete. "Genetic complementation of Calcofluor white hypersensitive mutants of the filamentous fungus *Aspergillus nidulans* strain RCH 48."

Altovise Ewing '05 and Cate Fenster. "Role of Interleukin-16 in the localization of K⁺ channels."

Lauren Fay '05, Terry Hill & Darlene Loprete. "Identification of a gene affecting Calcofluor resistance, branching and septum placement in *Aspergillus nidulans*."

Becky Heinecke '04, Alan Jaslow, and Ashlee Vaughn (Memphis Zoo). "Microhabitat use in captive giant pandas: A study for management decisions."

Katie Jameson '05 and Mary Miller. High copy suppression analysis of mis-localized G1 cyclin *CLN3* in the budding yeast *Saccharomyces cerevisiae*." Katie won 1st place for her poster presentation.

Jeshenna Johnson '04 and Tony Becker. "Handedness as a form of sexual selection in giant pandas, *Ailuropoda melanoleuca*."

Bailey Nichols '04 and Tony Becker. "Change in social structure in the Sulawesi macaque."

Leslie Patterson '04, **Rupal Patel '05**, and Tony Becker. "Courtship behavior in the *Giraffa camelopardalis reticulata*."

Melanie Woods '05 and Tony Becker. "Analysis of social dominance among reticulated giraffes, *Giraffa camelopardalis*."

Fourteen undergraduates from Christian Brothers, the University of Memphis and Rhodes presented their research at the TAS meeting last spring held here on the Rhodes campus. From Rhodes, the following students presented:

Kimberly Bartmess '04 and Jon McCullers (St. Jude). "The effect of glycosylation in the virulence of Influenza A (H3N2) viruses."

Sandra Culpepper '04, Jay Blundon and Michael Dyer (St. Jude). "Development of new chemotherapy treatment for retinoblastoma."

Karen Dobyns '05 and Jay Blundon. Using an eight-arm radial maze to study learning and memory in mice lacking Interleukin-16.

Lauren Fay '05, Terry Hill and Darlene Loprete. "Identification of a gene affecting Calcofluor resistance, branching and septum placement in *Aspergillus nidulans*."

Katie Jameson '05 and Mary Miller. High copy suppression analysis of mis-localized G1 cyclin *CLN3* in the budding yeast *Saccharomyces cerevisiae*."



Curricular Evolution: Course Changes and Announcements

Students who are now taking Biology I (BIO-130) and who feel ready to begin their upper level biology studies without waiting until their sophomore year are reminded that there are upper-level courses being offered next term that do not require both semesters of core biology (BIO 130 and 140) as a prerequisite. These are Evolution (BIO-200), Coral Reef Ecology (BIO 252, 253, 254) and Environmental Issues and Field Study in Southern Africa/Namibia (BIO 212 & 214). Students who are doing well in Biology I and who're confident of their preparation for continued study in biology may take Evolution or Coral Reef Ecology simultaneously with Biology II (BIO-140). The two classes on Southern Africa require only one Biology course as a prerequisite or permission of the instructor.

Coral Reef Ecology

Grab your snorkel and fins! Coral Reef Ecology is being offered again this year. These 3 courses (BIO 252, 253, and 254) are bundled into an upper-level biology lab course with four hours of credit. Students take the two one-hour BIO 252 and 253 courses in the spring semester and the two-hour BIO 254 course at the Roatan Institute of Marine Sciences in Honduras. BIO 254 will be taught from June 4-18, 2005. BIO 253 will be taught Monday afternoons only and the BIO 252 meeting time is to be arranged after classes start.

If you are interested in taking Coral Reef Ecology, you must see Dr. Kesler before registration. There will also be an information session on Friday, October 29 at 4:15 in FJ-B. You can also find information about these courses at http://www.rhodes.edu/biology/kesler/coralreef_list.html.

Interested in a Field Trip Course to Southern Africa?

For the first time, the Biology Department is offering an opportunity to study the environmental issues in Southern Africa and to travel to Southern Africa for field study! Dr. Rosanna Cappellato will teach two 2-credit courses this year: BIO 212, which will be held at Rhodes during the spring semester, and BIO 214, a field course to Namibia that will take place during June. These courses require only one Bio course as a prerequisite (which may be Bio 105), or permission of Dr. Cappellato, so tell your friends and roommates in other majors to join

you for this awesome opportunity. Students who complete both BIO 212 and 214 will receive 4 credits for an upper-level Biology course with a lab. This is a great way to get an upper-level Biology class or to fulfill that Natural Science distribution requirement! For more information, please contact Dr. Cappellato (x3081 or cappellator@rhodes.edu).

Biology 212. Environmental Issues in Southern Africa

This 2-credit, seminar-style course will be an interdisciplinary examination of the environmental issues of a region of the world famous for its captivating scenery, immense richness and dire scarcity of natural resources, and cultural diversity of its people. Special attention will be devoted to the role of parks and community-based conservation projects in achieving a balance between people's needs and wildlife conservation. Classes will be held on Tues. from 11:00-12:15, with some meetings scheduled for Thurs. at the same time.

Biology 214. Environmental Field Study in Namibia

This 2-credit summer field course will provide an in-country exploration of the major environmental issues of Namibia, one of the world's most arid and most beautiful countries. Students will spend three weeks, from June 1 to June 21, visiting different ecosystems,

Optimal Foraging

The following courses will be offered next semester

NUMBER	COURSE TITLE	HOURS OFFERED
140	Biology II 3 lecture sections	MWF 8:00-8:50; MWF 9:00-9:50; TuTh 11:00-12:15
200	Evolution	MWF 8:00-8:50
204	Mechs. of Development	MWF 9:00-9:50, Wed lab
207	Animal Behavior	TuTh 9:30-10:45, Thur lab
209	Embryology	TuTh 9:30-10:45
212	Env Issues in So. Africa	TuTh 11:00-12:15
240	Plant Physiology	MWF 11:00-12:15, Fri lab
252	Coral Reef Ecology (lit)	TBA
253	Coral Reef Ecology	Mon 2:00-2:50
301	Microbiology	MWF 12:00-12:50, Thur lab
325	Molecular Biology	MWF 10:00-10:50, Thur lab
340	Animal Physiology	TR 11:00-12:15, Mon lab
486-1	Cell Signaling	T,Th 3:30-4:45
486-2	Molecular Genetics	T,Th 3:30-4:45
FOR NON-MAJORS		
105-1	Biology of the Mind	TuTh 9:30-10:45
105-2	Environmental Science	MWF 10:00-10:50
105-3	Disease and Immunity	MWF 1:00-1:50

such as the Namib Desert, dry thornveld savannas, and the Kalahari sands. They will meet with indigenous people, NGOs, and governmental officers involved in local environmental issues. Rhino tracking and lion darting can be part of the educational experience during this field study trip. This course emphasizes critical thinking and interdisciplinary learning and is meant to challenge students' world-view to enable them to increase their awareness and knowledge of our global society.

Spring Senior Seminar Sections

BIO 486(1) Cell Signaling (Dr. Kadlec).

A fascinating aspect of biology is the degree to which not only individual proteins but also entire pathways are conserved throughout evolution. Signal transduction pathways found in a variety of different organisms are often composed of homologous proteins arranged in a homologous manner. This is interesting from an evolutionary standpoint, but it also has practical implications because the study of a particular pathway in one organism can provide insight into its role in another. In this seminar, we will be looking at the roles of various signaling pathways in development as well as the implications of the regulation of such pathways for human biology. For example, since many such pathways are important for the regulation of cell growth, proliferation, and/or differentiation, abnormalities in them are often linked to cancer. We will also highlight the convergence of different scientific approaches to a single problem (e.g. "How can a genetic screen in flies or worms teach us about tumors in mice or humans?"). Cell Signaling will meet Tues/Thurs 3:30-4:45.

BIO 486(2) Molecular Genetics

This course will meet Tues/Thurs 3:30-4:45. We are currently hiring someone to teach it, and are excited that the possible faculty would bring strong research experience to this discussion-based seminar class.

Plants + Biology = \$Money\$!

Want to try a different type of biology class this semester? Ever wonder how the application of biological knowledge can pay off? If so, try Plant Physiology with Dr. Stinemetz this spring semester. Students enrolled in the Bio-240 take an active role in co-teaching with Dr. Stinemetz on a variety of topics including: plants as early warning systems for bioterrorism, creation of environmentally friendly crops, tissue culture in the new biological pharmaceutical industry, and the potential for agriculture on Mars. The laboratory portion of the course is project oriented and will challenge you to not only design your own experiments but in some cases may afford you the opportunity to construct equipment of your own design! All of these topics and more will be covered within the context of how plants adapt, survive,

and thrive at both the cellular and whole plant level in varying environments. So, take a course that "Shows me the money!"



Signals and Displays (short communications)

The Rhodes Undergraduate Biological Journal will be soliciting articles for the 2005 publication in late January. If you are interested in publishing your work in this journal be on the look out for more information in November and December of this year. If you have any pressing questions, please feel free to contact the editor, Katie Jameson, at JAMKL@Rhodes.edu.

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. C. Jaslow**. The deadline for applications for this Research Award will be announced in the spring issue of Biofeedback.

HELLO FROM OUR NEWEST DEPARTMENT MEMBERS

DR. ROSANNA CAPPELLATO

Dr. Cappellato, a native of Rome, Italy, is the new environmental scientist. After graduating from the University of Rome, her journey to Memphis included a few years in Amsterdam, where she became a Doctorandus, and a few more years in Atlanta, where she received her Ph.D. from Emory University in Biology/Ecosystem Ecology.



After continuing her work on nutrient cycling as a Post-Doc with the National Research Council, Dr. Cappellato interests shifted to the studying of conservation strategies, such as the community-based conservation projects in Southern Africa. At Rhodes, she would like to learn about local and regional initiatives in this field, and involve the students in proposing and promoting projects fostering healthy interactions between human and natural communities.

DR. LISA KADLEC

Dr. Lisa Kadlec joins the Biology Department this year as a Visiting Assistant Professor. She is teaching Biology 130 and 131 as well as Cell Biology this fall, and will be teaching Mechanisms of Development (Biology 204) and Senior Seminar in the Spring.

Dr. Kadlec is very familiar with several characteristic elements of the Rhodes experience--a liberal arts education, the honor code, and gothic architecture. The former two were memorable aspects of her own undergraduate education at Haverford College, while the latter is reminiscent of her time spent earning her PhD at Duke University and her post-doctoral work at Princeton. She has received fellowships from the Department of Defense and the American Cancer Society to support research in various aspects of cell signaling, from the role of the protein BCR-ABL in human leukemias to growth factor signaling during fruit fly development.

Dr. Kadlec is an avid college basketball fan, particularly of the Atlantic Coast Conference and the Duke Blue Devils. She played soccer for four years at Haverford, and has since gone on to develop an abiding interest in the martial arts. She has a first degree black belt in shito-ryu karate (which she has been practicing for over nine years), as well as a brown belt in aikido.



DR. ANNETTE TEEPE

Dr. Annette Teepe joins the Biology Department as a Research Associate, working with Drs. Terry Hill and Darlene Loprete on their NSF-funded research project to identify genes that influence fungal cell wall integrity. Many of you may have met Dr. Teepe last year when she was a sabbatical replacement for Dr. Loprete.

Dr. Teepe has lived in Memphis for five years and came to Rhodes College after completing a postdoctoral research project in virology at St. Jude Children's Research Hospital.

Although Dr. Teepe has a long history with large institutions, with a BS from the University of Illinois, a MS from the University of North Texas, and a PhD from the



University of Pittsburgh School of Medicine, she really enjoys the liberal arts environment at Rhodes College. She finds the one-on-one interaction with the students to be challenging and rewarding.

Outside the lab, Dr. Teepe enjoys spending time with her husband and 8-year-old son, Alex. They enjoy outdoor activities like camping, hiking and canoeing.

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 Mu Rho chapter of the Tri Beta ($\beta\beta\beta$) Biological Honor Society would like to congratulate the 15 new members who were initiated on October 8th. Students interested in associate membership should contact Carolyn Westfall WESCJ@rhodes.edu. 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 2004-2005 school year are: President: **Carolyn Westfall '05**, Vice-President: **Katie Jameson '05**, Secretary: **Heidi Rademacher '05**, Treasurer: **Julie Bishop '05**, and Historian: **Desiree Steimer '05**.

This semester Tri Beta is offering many opportunities to get involved in the Biology Department, so we strongly encourage all members to attend the next meeting at 9pm on Thursday November 4th. Tri Beta will be organizing a science exposition at Rhodes for local elementary students in Nov. (those interested in participating in this event should contact Heidi at RADHA@rhodes.edu). Also, please go by and look at the graduate school boards located in FJ for any information about medical, pharmaceutical, or dental schools and graduate biology research opportunities. Tri Beta will host a final exam study break in Dec. Look for details on all events on the Tri Beta bulletin board

Zoo Summer Fellowships.

Deadlines for application for summer research fellowships at the zoo will be January 28th. Talk to **Dr. Alan Jaslow** if you are interested in this opportunity.



Cover page figures: At left: dir.coolclips.com/Nature/Animals/Zebbras/ At right: Figure 4. Expression of Src family kinases results in tyrosine phosphorylation and activation of c-Abl following transient transfection, from Plattner, R, **Lisa Kadlec**, K.A. DeMali, A. Kazlauskas, & A. Pendergast. 1999. c-Abl is activated by growth factors and Src family kinases and has a role in the cellular response to PDGF. <http://www.genesdev.org/cgi/content/full/13/18/2400>