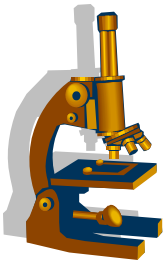
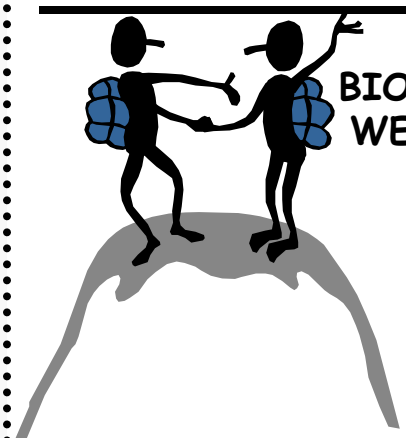
BioScope



Southwestern University
DEPARTMENT OF BIOLOGY



BREAKING NEWS:
BIOLOGY COMPLETES FACULTY HIRES AND WELCOMES DR. BEN PIERCE AS THE NEW LILLIAN NELSON PRATT CHAIR IN EVOLUTIONARY BIOLOGY

Below is a message and some background from Dr. Pierce (he can be reached at Ben_Pierce@baylor.edu):

I am honored and excited to be joining the faculty at Southwestern University in the fall as the Lillian Nelson Pratt Chair in Biology. I spent the first four years of my career teaching at a small liberal arts college (Connecticut College), and it has always been my dream to return to a liberal arts environment. I am grateful to Southwestern University for providing me with this opportunity.

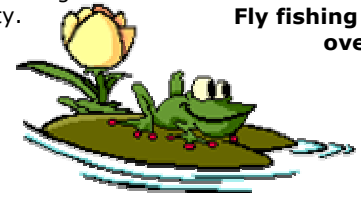
I grew up in Arlington, Texas and attended Southern Methodist University (BS Biology) and the University of Colorado at Boulder (Ph.D. Biology). I taught at Connecticut College for four years and then moved back to Texas to teach at Baylor University, where I have been a member of the biology faculty for the past 20 years. My best friend and wife for 25 years is Marlene Tyrrell, who is currently a Senior Lecturer in the Department of Computer Science at Baylor. We have two children, Sarah, who is a senior psychology major at Baylor, and Michael, who is a sophomore engineering major at SMU. I also enjoy spending time with our twelve-year-old Dalmatian, Checkers.

Dr. Pierce and Checkers. Dr. Pierce is the one on the right. This was taken several years ago, when he had more hair (☺ Editor's note – he wrote that caption).

My research focuses on ecology, genetics, and evolution, primarily of amphibians. Past projects include studies of factors that affect growth rates in amphibians, the influence of acidity on amphibians and how they evolve resistance to low pH environments, and development of better sampling techniques for amphibians. This spring I have a group of 8 undergraduate students who are helping with my research; we go out every Tuesday night and conduct auditory samples of frogs, which means that we listen for frogs and determine what species are present in an area on the basis of their calls. I am the author of a genetics textbook that is being used by over 150 colleges and universities and has been translated into 4 different languages.

In the past, I have been active in teaching, research, and administrative work, but my first love has always been working with undergraduate students. I am looking forward to doing lots of that at Southwestern University.

Fly fishing at Meridian State Park over spring break.



Issue 5: Spring 2005

March 31st 2004: The Biology Department's Honor Society, βββ, Continues to Thrive; Inducts 19 More Members!

Front Row – Associate Members: Ashley Batterlee, Amanda Mohammad, William Fu, and Jason Burnham. Full Members (left to right): Bryce Foster, Dr. Maria Todd (Graduate), Dr. Maria Cuevas (Graduate), Matt Gilbert, Barrett Cromeens, Carolina Boet, Tracey Einem, Jay Gupta, Lauren Shepard, Leslie McDonald, Laura Chatfield, Brian Boswell and Michelle Bouché. Other full member inductees not pictured include Alheli Garza and Adriana Hernandez.

βββ Advisors:
Dr. Sheller, Dr. Cuevas
& Dr. Gonzalez

Bio Twins:
Dr. Todd & Dr. Cuevas
(in green/black)

Bio Twins:
Jeanna Van Pelt
& Sarah Raison
(in pink/black)

βββ Members celebrate Induction with style and delicious food!

Tri-Beta regularly inducts eligible applicants who have completed the introductory Biology course as well as 1 upper-level Biology course, and who have a 3.0 Biology GPA and a 2.5 overall GPA. Students who do not meet these requirements, but who have an interest in Biology are inducted as Associate Members. This spring's induction took place in The Lord Center and was followed by an incredible spread from Baja Mexican food (see picture Pg. 2).

President: Josephine Thinwa **email: thinwaj@southwestern.edu**
Vice-President: Sarah Raison **email: raisons@southwestern.edu**
Secretary: Bhavik Kumar **email: kumarb@southwestern.edu**
Treasurer: Aurora Low **email: lowa@southwestern.edu**
Historian: Christina Granado **email: granadoc@southwestern.edu**
Volunteer Coordinator: Kristen Meerbrey **email: meerbrek@southwestern.edu**
PreMed Chair: Jeanna Van Pelt **email: vanpeltj@southwestern.edu**

***βββ* Goals**
1) To promote biological understanding and appreciation.
2) To provide activities and experiences in biology.
3) To expose students to numerous avenues in the biological field.

Officers at Induction (from left to right): Josephine, Sarah, Jeanna, Bhavik and Christina

CONGRATULATIONS TO THOSE STUDENTS SELECTED FOR THE 2005 BSRP & MERCK:

Dr. Sheller
Manjah Fernandez and Angela Nordin

Dr. Burks
Brandon Boland and Matt Barnes

Dr. Todd
Jay Gupta and Kristen Meerbrey

Dr. Gonzalez
Ian Bothwell and Matt Halpert (MERCK)

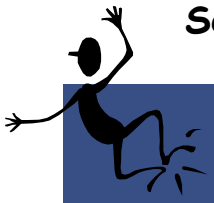
Dr. Taub
Sara Huie and Robert Lockwood (MERCK)

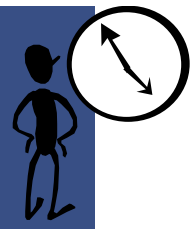
Dr. Cuevas
Carolina Boet and Tracey Einem (MERCK)

BIOSCOPE FOCUS: Scholarly Updates

- **BSRP FUNDED!! – Southwestern University recognized the need for undergraduate research and supplied funding for a 2005 Biology Summer Research Program.**
- **DEPARTMENT SEMINARS – Dr. Rebecca Sheller** recently (3/31/05) gave a talk on "Severed Nerves" in the Biology Seminar Series (BSS).
  - **MERCK Students Aaron Guel (advisor Dr. Max Taub)** and **Carolina Boet (advisor Dr. Maria Cuevas)** will also participate in BSS on 4/14. **Bhavik Kumar (advisor Martín Gonzalez)** and **Sarah Smith (advisor Martín Gonzalez)** gave seminars earlier in the semester.
- **CAMPUS SEMINAR – Dr. Maria Todd** also volunteered her expertise on 3/31/04 to the campus community in a presentation titled "The New Age of Cancer Therapeutics."
- **MUNDY FELLOWSHIP – Sophomore Brandon Boland and Dr. Romi Burks** received travel funding to pursue collaborative research on applesnail ecology in Uruguay.
- **NEW PAIDEIA PROFESSOR –** Congratulations to **Dr. Max Taub** on his selection as a new faculty advisor in the Paideia program. **Dr. Sheller** continues Paideia with a 3rd group of students.
- **WORKSHOP ATTENDED: Dr. Burks** and Environmental Studies Major **Becca Marfurt** attended the USDA's Task Force Meeting on Invasive Mollusks in Houston. This meeting specifically targeted members of the applesnail family. Becca also received a **travel grant** to present her work at an upcoming meeting.
- **PROFESSIONAL SCHOOL ACCEPTANCES: Medical - Jason Matthews, Rae Taylor and Jill McClain; PA – Christina Granado; Graduate – Becca Marfurt.**
- **BRAINBOWL!! Dr. Sheller and Psychology Faculty Fay Guarraci** took students to Brain Bowl at UT Health Science Center. The team (**Kim Boyd, Barrett Cromeens, Jessica Lynn DeFilippo, Brittany Mason, Staci Benson, Matt Gilbert, Jenna Oglesby and Joleen Kayanickupuram)** had a great time and did well.
- **CULLEN GRANT AWARDED: Ms. Linda Johnson** and **Dr. Maria Todd** received curricular funding to develop a new mini-course called Genes and Molecules that will be introduced into the 1st year curriculum in Spring '06 (see last page for more info).
- **SAM TAYLOR GRANT: Dr. Sheller** received external funding for her work on the giant medial axon (GMA) in crayfish.
- **KING CREATIVITY: Sarah Raison** and **Blithe Casterline** received grant for project: "The Unseen World: A Microbiological Photo Safari."
- **PEDAGOGICAL PUBLICATION: Dr. Burks** with colleagues from Rhodes College released a study on the importance of information fluency in the 1st year Biology Curriculum. For PDF, see the webpage of Dr. Burks (www.southwestern.edu/~burksr) or (http://www.cellbioed.org/pdf/04-07-0046.pdf).

See how your fellow Biologists (and related majors) juggled their time to participate in Undergraduate Research!



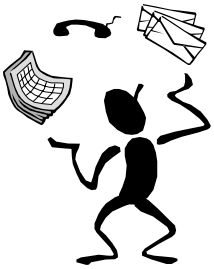


The Sixth Annual

Southwestern University

Undergraduate Research and Creative Works Symposium

April 7, 2005



ORAL PRESENTATIONS

5:20 p.m. **10. Targeting of the UmuC protein for destruction by the Lon protease**
Josephine Thinwa, Department of Biology, Southwestern University

5:40 p.m. **11. Effects of DNA-reactive -OH Tamoxifen on endometrial cell lines**
Carolina Boet, Department of Biology, Southwestern University

7:05 p.m. **13. Regulation of SOS Mutagenesis: In Vivo Degradation of UmuD by ClpXP in Esherichia coli**
Jason Matthews, Department of Biology, Southwestern University

7:45 p.m. **15. Indigenous South African Healing Practices and their Effect on TB and HIV/TB patients' Utilization and Compliance with Anti-TB Medication**

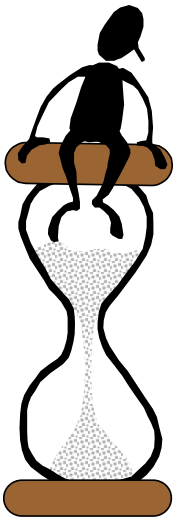
7:05 p.m. **19. Moderate Doses of Caffeine Alter Sexual Motivation in Female Rats**
Anastasia Benson, Department of Psychology, Southwestern University

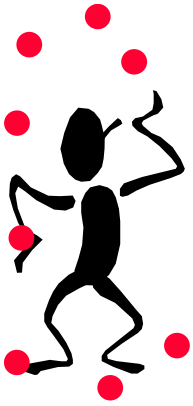
7:25 p.m. **20. The Role of the CS in Determining the Nature of the CR in Cuttlefish (*Sepia officinalis*)**
Anne Peters, Elizabeth Riedlinger, Department of Psychology, Southwestern University

7:45 p.m. **27. Analysis of Handedness and Laterality Through Observation of Bipedal Feeding in Captive Chimpanzees**
Blair Quinius, Department of Animal Behavior, Southwestern University

8:05 p.m. **28. Invaders from the South: Applesnail Ecology and Life History**
Rebecca Marfurt, Department of Biology, Southwestern University

8:25 p.m. **29. Induction of SOS Mutagenesis under Starvation Conditions**
Bhavik Kumar, Department of Biology, Southwestern University





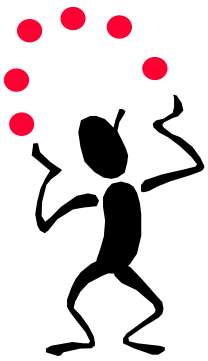
POSTER PRESENTATIONS

34. *May Give Cues to Survival: N Vs. P Pesticides Uniquely Impact Reproduction in* Daphnia Magna *at Different Scales*
Austin Hill, Department of Biology, Southwestern University

46. *Characterization of the* Escherichia coli *B UmuD gene and gene product: implications and regulation of SOS mutagenesis*
Elizabeth Williams, Department of Biology, Southwestern University

57. *Reaction of alpha-acetoxytamoxifen with DNA: Recognition and structural effects of covalent modification*
Sarah Smith, Department of Chemistry, Southwestern University

63. *Serotonin in the Medial Preoptic Area Contributes to the Sensitivity of Female Rats to Sexual Stimulation During Paced-Mating Behavior*
Brittany Mason, Anastasia Benson, Department of Psychology, Southwestern University



Learn something new from BioScope Magnifications:

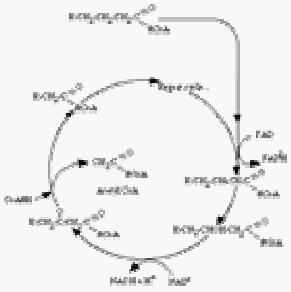
- **MOLECULE: LEPTIN**

Leptin (from the Greek word *leptos*, meaning thin) is a 167-amino acid peptide hormone secreted by adipose tissue with important effects in regulating body weight, metabolism and reproductive function. Leptin acts via a plasma membrane receptor, which is a member of the cytokine receptor superfamily. Certain obesity syndromes are characterized by mutations in the gene that codes for leptin or its receptor, leading to inadequate amounts of leptin or the lack of receptors.

- **MOLECULAR PATHWAY:**

Fat molecules consist of three fatty acid chains connected by a glycerol backbone. Fatty acids are basically long chains of carbon and hydrogen and are the major source of energy during normal activities. Fatty acids are broken down by progressively cleaving two carbon bits and converting these to acetyl coenzyme A. The acetyl CoA is the oxidized by the same citric acid cycle involved in the metabolism of glucose. For every two carbons in a fatty acid, oxidation yields 5 ATPs generating the acetyl CoA and 12 more ATPs oxidizing the coenzyme. This makes fat a terrific molecule in which to store energy, as the body well knows (much to our dismay).

http://muscle.ucsd.edu/musintro/fattyacid.shtml



- **ORGANISM – *New species of Fairy Shrimp*** (not even named yet…)

March 16, 2005—Idaho biologists have discovered a new species of fairy shrimp. But don't be fooled by the name. This fairy shrimp species is the "biggest, baddest, thuggy-est of them all," said Dana Quinney, an Idaho National Guard biologist who announced the find yesterday. The 3-inch (7.6-centimeter) species is among the biggest of the approximately 300 known fairy shrimp species. But size isn't everything. The shrimp's feathery-looking legs are studded with spines—even the spines have spines, Quinney says. The voracious feeder is known to clutch several smaller shrimp to its abdomen, just in case its food supply runs low.

http://news.nationalgeographic.com/news/2005/03/0316_050316_fairyshrimp.html

- **ECOSYSTEM – Plata del Rio**

visibleearth.nasa.gov/ cgi-bin/viewrecord?12997

Plata, Río de la (rē'ō *th*ā lä plä'tä) , estuary, c.170 mi (270 km) long, SE South America, formed by the Paraná and Uruguay rivers. Between Argentina and Uruguay, **the estuary is c.120 mi (190 km) wide at its mouth on the Atlantic Ocean** and decreases to c.20 mi (30 km) near its head. Focal point of the second largest river system of the continent, the estuary receives a tremendous volume of water. Its northwestern end contains freshwater. Extensive sandbanks and shoals reduce the navigability, but constantly dredged channels permit navigation by large vessels; Buenos Aires and Montevideo are the chief ports.

Discovered (1516) by Juan Díaz de Solís, it was explored by Ferdinand Magellan in 1520 and by Sebastian Cabot from 1526 to 1529. The first settlement on its banks was made (1536) at Buenos Aires by Pedro de Mendoza, the Spanish conquistador. A principal channel into the interior of SE South America, it is very important commercially. In English it is sometimes called River Plate. The viceroyalty of Río de la Plata, more or less corresponding to the present Argentina, Bolivia, Uruguay, and Paraguay, was established in 1776.

http://www.answers.com/topic/river-plate

Students and Faculty interested in submitting announcements, items for focus, profiles or highlights (i.e. Magnifications) to *BioScope* should email Lindsey Loveless (lovelesl) or Dr. Burks (burksr). Next Issue: August 2005

BioScope aims to heighten communication and engagement between biology students and faculty. If you have ideas for activities that can bring Biologists together, please forward them to Biology Chair, Dr. Rebecca Sheller (shellerr). Also, if you haven't signed up on the Biology list-serve (su-biology), please do so ASAP as faculty often post Announcements about outside research and career opportunities.

Biologists & Psychologists collaborate to shape Animal Behavior Major

What's the best thing about the AB major?

Dr. Burks
Aquatic Ecology

The ability to pursue two disciplines simultaneously and then the focus on learning how to approach integrated questions from different perspectives.

Dr. Cuevas, Endocrinology

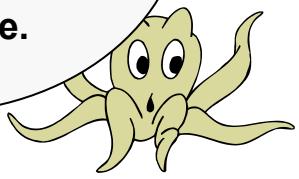
I like the emphasis that AB places on student-faculty interactions.

Dr. Guarraci, Neuroscience

The direct involvement of undergraduates in a wide range of scholarly research.

Dr. Purdy, Chair
Learning

Really 2 things: 1) its uniqueness and 2) the fact that students get solid hands-on research experience.



See article In *Science*

Did you know?

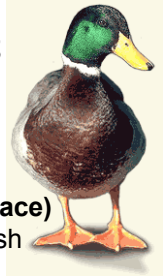
Scientists recently found that small octopi (*Octopus marginatus*) use a two-armed "walk" to help them slip away from predators unnoticed?

The ABCs of AB:

•The major in Animal Behavior is an interdisciplinary program offered by the departments of Biology and Psychology.
•The program is designed to prepare students for graduate programs in animal behavior, animal learning, behavioral ecology, biopsychology, ecology, neuroscience, and veterinary science.
•Students interested in veterinary school are advised to obtain clinical experience and take a full year of Chemistry and Math.
•**NEW – Students may seek either a Bachelor of Arts degree or a Bachelor of Science in AB.**
•Students are required to participate in research projects under the supervision of faculty members. The research may be conducted both in departmental laboratories and at field sites. Finally, this research leads to a capstone project (usually in the senior year) consisting of original research in the student's area of interest and in cooperation with one of the program's faculty advisors.

SWPA
southwestern psychological association

Animal Behaviorists Give Presentations at Regional Conference



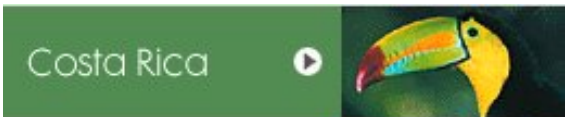
•**Riedlinger, Elizabeth M., Peters, Anne E., Purdy, J. E. (2nd place)** "The role of the CS in determining the nature of the CR in cuttlefish (*Sepia officinalis*)";
•Richardson, A. S., Lambeth, S. P., **Schapiro, Steven J.** "Using choice procedures to determine musical preferences in captive chimpanzees *(Pan troglodytes)*";
•**Quinius, J. Blair, Schapiro, S. J.,** & Hopkins, W. D. **(3rd place)** **"**Analysis of handedness and laterality through observation of bipedal reaching in captive chimpanzees (*Pan troglodytes*)";
•White, R. E., **Schapiro, S. J.,** & Hopkins, W. D. "Inverted and isometric acquisition of joystick tasks in chimpanzees (*Pan troglodytes*)";
•Lambeth, S. P., Hau, J., Perlman, J. E., Martino, M. A., & **Schapiro, S. J.** "Positive reinforcement training effects on physiological measures in captive chimpanzees (*Pan troglodytes*)";
•**Guarraci, Fay A.** "The medial preoptic area plays a critical role in sexual motivation in female rats";
•**Benson, Anastasia, Mason, Brittany L., Guarraci, F. A.** "Moderate doses of caffeine alter sexual motivation in female rats";
•Krause, M. A., & **Purdy, J. E.** "Toward a methodology to determine salmon responses to social and predatory vocal cues of killer whales."

Animal Behavior is currently undergoing a 10-Year Review. Dr. Bill Timberlake from Indiana Univ. recently visited campus to assist. If you have opinions or comments about The AB program or wish to get involved, Please contact the AB Chair, Dr. Jesse Purdy at purdy@southwestern.edu

March 24-26 at the Peabody Hotel in Memphis, TN

Did you think Study Abroad is impossible for a Biology Major? Think again!

The School for Field Studies
Environmental Field Studies Abroad



Check out the School for Field Studies at http://www.fieldstudies.org/. You can wake up next to zebras in Kenya, observe gray whales in Baja or check out the impact of roads on rainforests in Costa Rica. Plus meet incredible students from all over the country.

There are semester and summer programs at each of these sites.

Studying abroad takes planning but it is entirely doable for a science major with some effort. Fitting a semester-long experience into the requirements of a Bio Major might take summer school or other astute planning, but the payoff is entirely worth it. With the new Paideia program, we expect that many of our students will be looking for a Study Abroad Experience. One suggestion is to find programs that award actual science credit. To check out opportunities for Biologists, Dr. Burks went in January to check out the Costa Rica Site of SFS (pictures below from a field trip to National Rainforest Park – Braulio Carrillo). All the Center Directors of the various sites also attended. At each site, students take 4 courses (+ a language/cultural component at the Costa Rica and Mexico site). Two of these four courses would directly equate to Ecology and Introduction to Research (in the Dept. of Biology) and the other two could be used as elective hours (mix of lower/upper). Southwestern is looking into becoming an Affiliate of this program where our students would get some preference and faculty could visit sites to evaluate or do research. If you have questions, please contact Sue Mennicke in the Study Abroad Office or talk with Dr. Burks as well.

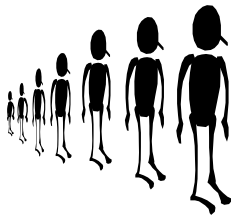
Bromeliad with flower, Dr. Burks in rainforest, Lobster Claw, Costa Rican River

Biofunny (www.nearingzero.net) dedicated to the efforts of Dr. Cuevas and Dr. Todd to enhance the cell culture facilities at SU.

Curriculum Corner: A year's work by the tenure-track faculty has culminated with the submission of major catalog changes (February, 2005) to **improve** the Biology curriculum for majors and minors. This will be in place for the new incoming class. The Biology Department plans to add a semester of biological methods in reading, writing, and quantitative skills to the curriculum so that our students have every opportunity to actively participate in the science of Biology. To accomplish this addition to the curriculum, we are re-formatting our introductory mini-course sequence by ***omitting the mini-course, Life Processes, from the first year curriculum and replacing it with Genes and Molecules*** (Life Processes will be offered for the last time in Fall 2005 and Genes and Molecules will be offered for the first time in Spring 2006). By placing an introductory course in molecular biology into the first year curriculum, we are able to ***omit the Sophomore-level Molecular Genetics course.*** Biology Sophomores will take ***a semester of methods courses, in both Cell and Molecular as well as Ecology and Evolutionary Biology*** in a mini-course format, beginning in Fall 2006. These curricular changes will better support student's life-long learning, enhance student involvement in our upper-level courses, and allow for more student research experiences.

Biology Seniors – Want to have a Picnic to celebrate your accomplishments?
The Department of Biology invites You to Lake Georgetown
1:00 pm, Friday, April 29th
(look for more details to follow)

Last Arena Registration: Tuesday, 4/5 represented the last time that students will meet in the gym to sign up for classes. For the Fall, the Biology Department will offer the following upper levels:



- Botany with Dr. Taub (MWF 10/Th Lab)
- Evolution with Dr. Pierce (Tu/Th 9:30/Tu Lab)
- Organ Phys with Dr. Sheller (MWF 9/Tu or W lab)
- Micro with Dr. Gonzalez (Tu/Th 9:30/W or Th lab)
- Biochem with Dr. Bruns (MWF 8/Tu, W or Th lab)
- Capstone (Exotic Species focus) with Dr. Burks (12/M)
- Intro to Research Hours – sign up with particular 10 faculty members