

Southwestern University

DEPARTMENT OF BIOLOGY

SU Biologists Cash In at the Texas Academy of Sciences Meetings!



Student winners

Student Winners with Faculty Mentors

\$ The Outstanding Oral Presentation Award went to **Brandon Boland** for his talk entitled “Distinct palettes: feeding preferences between native and exotic applesnail populations” in collaboration with **Dr. Romi Burks**;

\$ **Manjah Fernandez** received Honorable Mention for his talk entitled “Ubiquitin and heat shock proteins in the severed ventral nerve cord of the crayfish *Procambarus clarkii*”, which is co-authored with Biology Department Chairperson **Dr. Rebecca Sheller**;

\$ **Sheeba Varughese** received 2nd Place in Outstanding Poster Presentation for her research titled “Salt tolerance mechanisms of panicoid grasses”. This work represented an MERCK interdisciplinary effort between Varughese, **Dr. Max Taub**, and chemist **Dr. Emily Niemeyer**;

\$ **Tracey Einem** captured 3rd Place for Outstanding Poster with her presentation titled “Effects of 4-OH tamoxifen on HEC 1B endometrial cancer cells”. The Merck Scholars Program also sponsored Einem’s collaborative research with **Dr. Maria Cuevas**, and chemist **Dr. Maha Zewail-Foote**; and

\$ **Elizabeth Williams** received an Honorable Mention for her poster presentation entitled “Determination of the Lon recognition site on the UmuC protein in *Escherichia coli*” co-authored with **Dr. Martín Gonzalez**.

\$ **Brandon Boland** and **Matt Barnes** tied for 1 of 2 awards toward continued research as winners of the Collegiate Academy Undergraduate Research Awards.

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Research & Teaching Take SU Biologists around Texas and Beyond!



Top Row: Jay Gupta, Kristen Meerbrey, Sheeba Varughese and Manjah Fernandez

Next Row Down: Matt Barnes, Brandon Boland, Angela Nordin, Dr. Romi Burks, Elizabeth Williams and Ian Bothwell

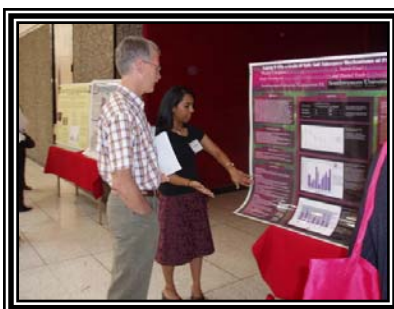
2nd Row from Bottom: Dr. Maria Cuevas, Sara Huie, and Tracey Einem

1st Row: Ms. Linda Southwick, Carolina Boet, Dr. Rebecca Sheller, Dr. Maria Todd, Dr. Ben Pierce, and Dr. Martín Gonzalez.

Twelve biology students and seven faculty members journeyed to Beaumont, Texas, to share their research with other scientists at the 109th annual meeting of the Texas Academy of Sciences. The efforts of the Fleming-sponsored Biology Summer Research Program (BSRP) and the Merck Scholars Program paid off with resounding success.



Dr. Maria Cuevas and Junior MERCK Scholar Tracey Einem at the St. Louis Arch. The two of them presented a poster at the American Association for the Advancement of Science Meetings (AAAS) in February.



Sheeba and Liz talking to scientists during TAS poster session.



Pitstop on the way to Beaumont.



Paideia Scholar and Biology Junior Brandon Boland admiring the coast off Uruguay.



Dr. Romi Burks at a costume party celebration in Uruguay with colleagues Claudia Fosalba (left) and Marianna Meerhoff (right).

Article about Uruguay – see next page

Dr. Burks and Brandon Boland return from successful 26-day research trip to Uruguay

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Perspective of Dr. Burks: From my outlook, this trip went exceedingly well. We luckily escaped single December ice storm to safely arrive in UR. My colleagues proved incredibly giving of their time and lives as we spent Christmas and New Year's with them. I discovered the people in UR to be friendly, interesting and well-versed in many different areas. My intensive conversational Spanish class paid off immensely and I enjoyed expanding my abilities on a daily basis. It was challenging to consider the aspects of working in a foreign environment from commuter time to staffing to acquiring items that were less than convenient. However, for the short time we were there, we achieved our professional goals and then some. Although I spent much of each day with a student, we never seemed to run out of things for discussion and found a nice balance between working and finding time to experience the culture as well. While this adventure took a large investment of time and resources, I would do it again without hesitation. I hope for more opportunities to do international collaborations.

Perspective of Brandon: My recent trip to Uruguay not only broadened horizons with my own research, but with my view on the scientific community as well. Experiencing science in another country made me realize how much seemingly disjointed countries have in common. Cultural and political differences aside, my focus on science allowed me to identify a common thread and appreciate both the similarities and differences Uruguay had to offer. By identifying a common interest, I adjusted to and really began to enjoy the cultural differences. Independent research afforded me the opportunity to do something I could have never imagined only a few years ago. I realize that Southwestern provides relatively unobstructed opportunities to pursue academic interests, provided the initiative to pursue such interests is present. I'm very grateful I got involved early on, and I encourage anyone to pursue even a slight research interest. You never know where it will take you.



- A. Field site in Punta del Este, 150 km from Montevideo, UR
- B. Facultad de Ciencias (building where we worked)
- C. 2nd field site where we collected snails
- D. Lab where we did experiments
- E. Hotel room
- F. Main thoroughfare near hotel called "Rambla."
- G. Common method for cooking
- H. New Year's Eve Party on the streets.
- I. Dr. Burks "in the field" collecting snails
- J. Brandon counting eggs in the lab
- K. Touring downtown Montevideo, UR



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.

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February 23rd The Biology Department's Honor Society, βββ, Inducts 25 More Members!



Associate Members

- Sarah Ferrero
- Kara Frantzych
- Jennifer Gibbs
- Caitlin Gibson
- Amber Hoefauf
- Michael Hust
- Jordan Ingram
- Sumith Jampana
- Taylor Jones
- Radhika Kainthla
- Jaclyn O'Kramer
- James McDonough
- Fern Nguyen
- Samantha Penney
- Bryt Piana
- Dustin Staloch
- Mariel Stribling
- Evan Wedig
- Kristin Yeung

Regular Members

- Matt Barnes
- Ashley Batterbee
- Brandon Boland
- Tara Brace
- Jason Burnham
- Sarah Clay
- Brad Culling
- Ian Daulton
- Jean Herberger
- Christopher Kaufmann
- Matthew Kauffman
- Robert Lockwood
- Stephanie Russell
- Kurt Seilheimer
- Abby Youens

Officers:

President – Greg Hagemann
(hagemang@southwestern.edu)

Vice President – Josephine Thinwa
(thinwaj@southwestern.edu)

Secretary – Adriana Hernandez
(hernanda@southwestern.edu)

Treasurer – Brian Boswell
(boswellb@southwestern.edu)

Pre-Med Chair – Bhavik Kumar
(kumarb@southwestern.edu)

Volunteer Coordinator – Laura Chatfield
(chatfiel@southwestern.edu)

Historian – Leslie McDonald
(mcdonall@southwestern.edu)

Do you know what the 3 βs stand for?



Advisors

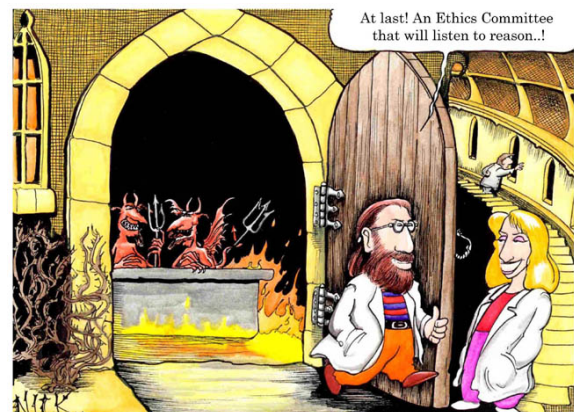
Upcoming Events

March:

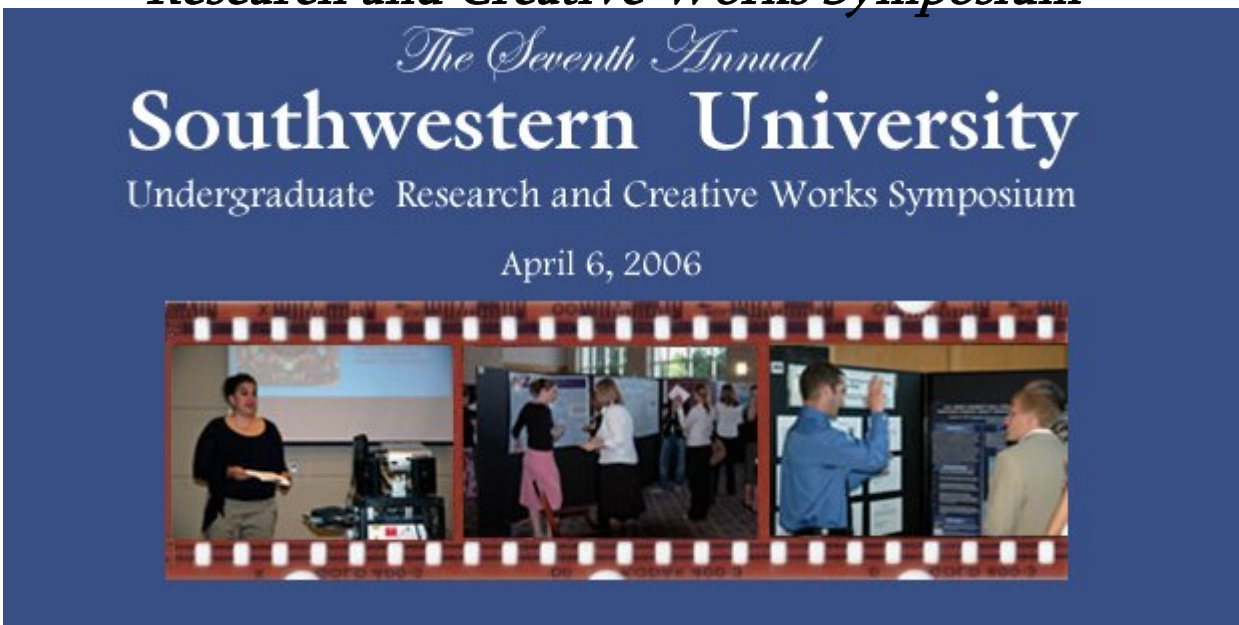
- *Tue 07 Bruns follow-up talk
- *Thu 09 Bruns Thu seminar and Hutto Elementary Math/Science Night
- *Mon 20 Dr. Burke visit
24 Ice Bats Hockey Game
- *Thu 30 Ellen Richie - Asst Dean of Biomedical Science at MD Anderson Smithville
- ?? Movie Night
- ?? Trip to Inner Space Caverns

April:

- * Mon 10- Fri 14 Can Food Drive/Cancer fundraiser (More info to come later but we'll need volunteers)
- ?? Movie Night
- ??Tri-Beta BBQ



Biology Majors Organize 2006 Undergraduate Research and Creative Works Symposium



QUESTIONS – Contact the Program Chairs:

Jay Gupta (guptaj@su.edu), or Tracey Einem (einemt@southwestern.edu), OR VISIT:
<http://www.southwestern.edu/academic/symposia/SUURCWS/>

From your perspective, what does the SUURCWS do for students?

TRACEY: I think that undergraduate research allows students to think for themselves and experience the actual research process. Lectures tend to hand information straight to you, while research requires reading, experimenting, and making unique conclusions. Critical thinking is one of the most important skills students can acquire.

JAY: I feel that the Symposium is one of the best ways that SU students can “wet their feet” for such high level presentation conferences that they may find themselves in the near future. In other words, this event allows for great practice in addition to the most important benefit from a campus perspective—students of all majors get to show their peers exactly what they have been working on for quite some time. Specific to research, it is the best experience a student can have that lets them appreciate the knowledge they learn from classes. This results from the fact that research essentially is learning about a topic of interest. One ultimate benefit of a research experience is that your classroom experience becomes much more heightened. Research allows you to take charge of your learning.

Why would you encourage students to present their research at SUURCWS?

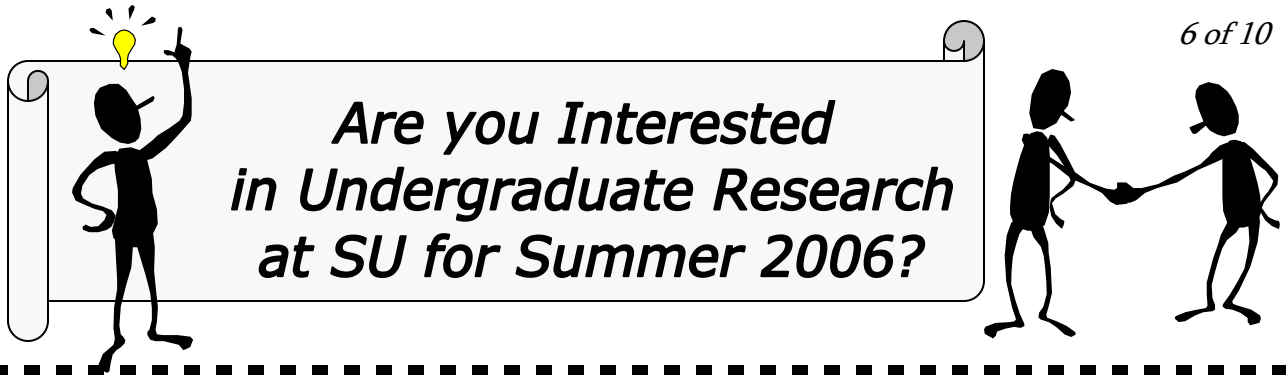
TRACEY: I The act of sharing research is an excellent opportunity for personal growth. The ability to speak clearly and concisely to others is something that takes practice and the symposium is one event that fosters this ability. In addition, students in one major rarely know what other departments are undertaking in terms of research. The symposium allows the dissemination of exciting research across many diverse disciplines here at Southwestern.

JAY: The best way to answer this is by bringing up a practical example. At SU, a student may have friends involved in a diverse range of activities. More importantly, a student may have friends that are majoring in something completely different to their own. This student may know everything that is going on in their friends’ lives, but most of the time, you never realize what it is they are learning on their own. Here is where the Symposium comes in. This event is an excellent avenue for your peers to see everything that you have spent much time and effort in. They get to see what your academic experience has truly been about. On a more practical level, the fact that you presented in this campus-wide Symposium that is open to the public shows something to your professors. They usually take this participation as a positive mark when considering you in writing a letter or recommendation for example. Equally, participation in the Symposium looks wonderful on a résumé.

What goes into organizing such an event?

JAY & TRACEY: To organize this Symposium, it takes commitment, organization, leadership, creativity, hard work, time, and goals. I won’t lie, this Symposium has been a challenge, but a challenge well worth the effort. For us, we have had to be very careful about our organization and coordination when planning the event. As directors, we have to meet regularly with our mentor Dr. Fabritius as well as countless others that are essential to making the event a success. In addition to our meetings, we have to be effective in our communication both to staff/administration, professors, and students. Here is where our leadership abilities become tested. It rests on our shoulders to direct necessary components in organizing the event. Likewise, a clear vision is needed of what you want in this event. That is why it is great to make goals, think creatively for the event, and carry out your will. One can expect that with all these requirements, we have had to work efficiently (especially when juggling other commitments).

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.



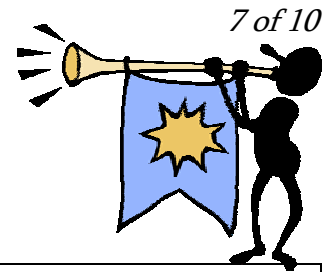
Are you Interested in Undergraduate Research at SU for Summer 2006?

The Department of Biology is now recruiting students for the **BSRP – Biology Summer Research Program** to take place Summer 2006.

- **Purpose** - To provide an opportunity for qualified students majoring in biology to become involved in a research project with a faculty mentor at Southwestern University.
- **Eligibility** - Qualified students majoring in biology and currently enrolled at Southwestern University are eligible for a summer undergraduate research position provided they (1) have a minimum GPA of 3.0 (on a 4.0 scale) or with permission of faculty and (2) will be enrolled as a full-time student during the 2005-2006 academic year. We strongly encourage members of groups underrepresented in the sciences (i.e., women & minorities) to apply.
- **Projects** - Participating students will work closely with a faculty mentor experienced in teaching students how to do research. Each student-faculty team will conduct original research in one of three general areas: Cell/Molecular Biology, Organismal Biology, or Ecology/Population Biology. The possibility for interdisciplinary projects also exists. Completed projects will be showcased at the BSRP banquet, the 2006 Undergraduate Research and Creative Works Symposium and at regional or national scientific meetings.
- **Program Dates** - May 22nd - July 14th 2006 (tentative)
- **Stipend** - Student stipends will be approximately **\$300** for each of the **8** weeks plus a housing allowance.
- **Requirements** - Students will be asked to conduct research with a faculty mentor for at least 40 hours per week, write a substantial paper, and present their research at a state or national scientific meeting such as the annual Texas Academy of Sciences meeting (Spring 06). For many students, the research and research paper will support the capstone requirement for biology majors.
- **Faculty Involved:** Drs. Burks, Cuevas, Gonzalez, Pierce and Taub – Go and talk to them about possible projects.
- **How to Apply:** Fill out an application and submit it to Dr. Cuevas.



BIOSCOPE FOCUS: Scholarly Updates



- **BIOLOGY FACULTY CONTRIBUTE TO ENRICH PAIDEIA –** Congratulations to **Dr. Maria Cuevas** who will join the ranks of the Paideia Professors next year. **Dr. Taub** is in his first year now and **Dr. Sheller** will see her first cohort of Paideia scholars graduate soon!
- **INVITED SPEAKERS:**
 - **Dr. Ben Pierce**, professor of biology and holder of the Lillian Nelson Pratt Chair, was an invited speaker and presented "Using Auditory Surveys to Study Amphibian Declines and Detect Frogs for Environmental Surveys" at the Environmental Health and Ecology Symposium held at Huston-Tillotson University, Feb. 3.
 - Senior biology major **Matt Barnes** and **Dr. Romi Burks** gave an invited presentation at Rice University titled "A Tale of Two Snails: Investigating Life History Traits of an Exotic vs. a Native Population of Applesnails (*Pomacea*)" that summarized the research that has been conducted on applesnails in their lab. The presentation was a part of Barnes' interview for graduate school in the Ecology and Evolutionary Biology Program at Rice. **Dr. Romi Burks** provided a similar talk for the Biology Seminar Series with Biology Junior and Paideia Scholar **Brandon Boland**.
- **TEXTBOOK SUCCESS: Dr. Pierce** also published a college-level textbook *Transmission and Population Genetics: A Short Course*, an abridged version of his genetics book *Genetics: A Conceptual Approach*. In addition, Spanish and Italian translations of *Genetics: A Conceptual Approach* were recently published.
- **REVIEWS:** Congratulations to **Dr. Todd** who recently submitted materials for her 2nd year comprehensive review.
- **WAY TO GO!!! RESEARCH AWARDS: Ian Bothwell** and **Josephine Thinwa** presented their research at the Texas-Missouri Branch meeting of the American Society for Microbiology in Denton, Texas. Their research, which focuses on the regulation of DNA repair and damage tolerance mechanisms, was conducted in the laboratory of **Dr. Martín Gonzalez**. Thinwa's poster presentation was awarded outstanding undergraduate student presentation. The runner-up outstanding undergraduate student presentation went to Bothwell.
- **NATIONAL PRESENTATIONS: Junior Tracey Einem** and **Dr. Maria Cuevas** presented their research at the annual meeting of the American Association for the Advancement of Science in St. Louis, MO.
- **FACULTY FELLOWSHIP: Dr. Burks** received a Brown Junior Fellowship from the University that will provide time for grant-writing for funds for continued undergraduate research.
- **TAKING THE TEXAS ACADEMY OF SCIENCE BY FORCE:** Congratulations to the 6 faculty and 12 students that recently contributed either poster or oral presentations at the TAS meeting in Beaumont, TX.
 - **Dr. Ben Pierce** also gave a presentation entitled "Inter-Observer Variation in Detection of Frog Calls During Auditory Surveys" in the Terrestrial Ecology Session.
 - **Dr. Romi Burks** was also elected as the next Vice Chairperson of the Marine and Freshwater Ecology Section of TAS.

Students and Faculty interested in submitting announcements, items for focus, profiles or highlights (i.e. Magnifications) to *BioScope* should email Dr. Burks (burksr).

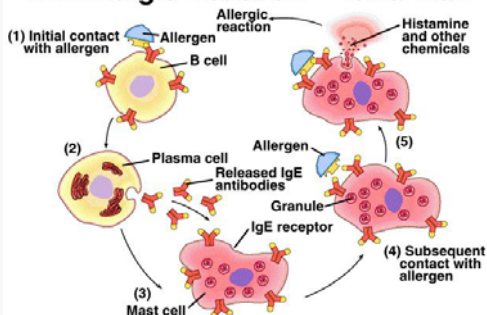
Next Issue: April or May 2006



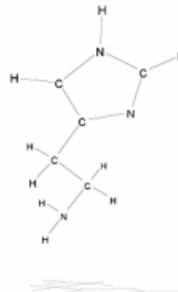
Learn something
new from
BioScope Magnifications:

MOLECULE & PATHWAY: HISTAMINE

An Allergic Reaction — Overview



histamine



For a relatively small molecule, histamine is anything but innocuous. The release of histamine (*hist* = because it's made up of histidine residues, *amine* = because it's a vasoactive amine) causes several allergic symptoms. 1) It contributes to an inflammatory response. 2) It causes constriction of smooth muscle. The second contributes to asthma.



• MINIATURE ECOSYSTEM – YOUR PILLOW!

Your favorite pillow holds an entire ecosystem of disgusting bugs and potentially deadly fungi, a new study suggests. The typical pillow contains more than a million fungal spores, researchers found. That's several thousand spores for every little gram of material. There's more. Other studies have shown pillows and other bedding harbor dust mites, microscopic spider-like creatures that feed on flakes of human skin. "We know that pillows are inhabited by the house dust mite which eats fungi, and one theory is that the fungi are in turn using the house dust mites' feces as a major source of nitrogen and nutrition (along with human skin scales)," says study leader Ashley Woodcock at the University of Manchester. "There could therefore be a 'miniature ecosystem' at work inside our pillows."

READ MORE AT:

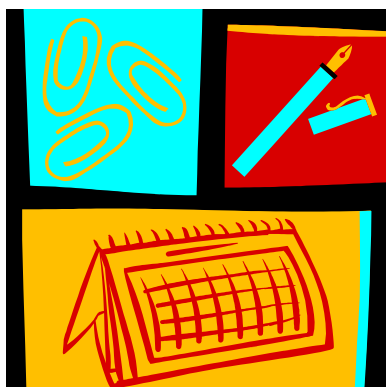
http://www.livescience.com/humanbiology/051014_pillow_ecosystem.html

• ORGANISM – *Mountain Cedar (Juniperus ashei)*



Mountain cedar pollen transported by the wind plagues allergy sufferers. Now those afflicted can be warned in time to prepare for the onslaught, thanks to technology developed in the plant pathology department.

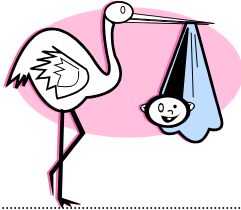
<http://www.cals.ncsu.edu/agcomm/magazine/spring99/images/newspl.jpg>



The Fall Term will be here before we know it. We are still working out some of the details but here is a TENTATIVE preview:

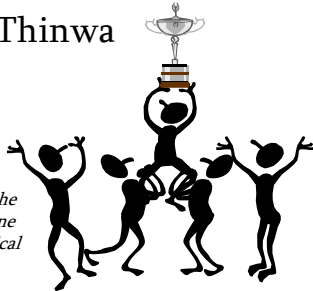
1st year courses: Biodiversity (Pierce), Cell Biology (Cuevas)
 2nd year Methods (NEW): Ecology/Evol (Taub), Cell/Mol (Gonzalez)
 Upper-levels: Organ Phys (Sheller), Evolution (TBD), Biochemistry (in Chem. Dept), Reproductive Physiology (NEW Cuevas), Cell Phys (TBD)
 Non-majors: Human Biology (Ard), Environmental Science (TBD)
 Capstone Seminars: Sheller and Cuevas
 Independent Research: All Faculty!

CONGRATULATIONS



In case you didn't know....The Biology Department is "expecting" a new addition this summer. Congratulations to Dr. Maria Todd and her husband Sean on this exciting news. "Little Todd" is scheduled to check in during early June.

BIOLOGY STUDENT OF THE YEAR: Josephine Thinwa



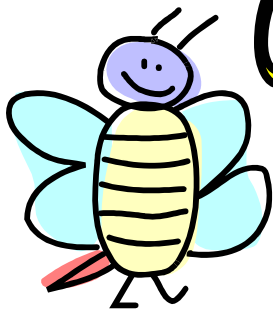
For her dedication to the Biology Dept., Josephine received the text, Medical Microbiology.

- Undergraduate Researcher with Dr. Martín Gonzalez
- Also summer research at Harvard University
- Bββ Officer
- Study Abroad Experience in South Africa
- Plan: Pursue M.D./Ph.D.



SU PRE-PROFESSIONAL STUDENTS

Approximately 77% of medical school applicants received acceptances this year as well as several students going to vet school or dental school. Grad school applications are still out there but all the hard work of our students deserves special recognition!



OTHER BUZZ

The renovations on Dr. Pierce's new research laboratory will soon be completed. Look for Open House Dates soon!

Thanks to SU Administration for upgrading our lab chairs in Rooms 200 & 212!

Members of the Biology Faculty traveled to Trinity University to talk about how they are using a grant from the Howard Hughes Medical Foundation. As we plan toward applying, we are open to suggestions. Talk to our Coordinator, Dr. Ben Pierce.

LOOK FOR PRESENTATION BY DR. VERONICA MARTINEZ! Dr. Martinez is currently a postdoctoral researcher at UT-Austin and will be coming to Southwestern to explore the possibility of teaching some courses and getting experience in the liberal arts environment.

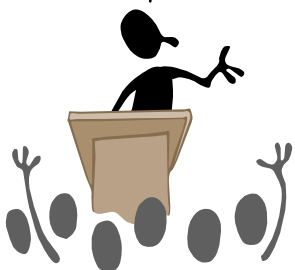
SENIORS - LOOK FOR INFO SOON ABOUT THE DEPT. ANNUAL SENIOR PICNIC!

SPRING 2006

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BIOLOGY SEMINARS

| | | | |
|-----------------|---|--|---|
| 9 Mar | Dr. Kerry Bruns Professor of Chemistry | Southwestern University | Radioactive tracers in biological research |
| 10 Mar | Dr. Laurence Hurley) | | Merck speaker – details to be announced |
| 16 Mar | SPRING BREAK | | |
| 23 Mar | Dr. Anna Rachinsky Assistant Professor of Biology | University of Minnesota at Duluth | Royal hormone therapy: endocrine regulation of caste development in honeybees |
| 30 Mar | Dr. Ellen Richie Professor, Department of Carcinogenesis | UT MD Anderson Cancer Center, Smithville | Elucidation of the mechanisms of lymphomagenesis |
| 6 April | Dr. Terry Miller Immunologist/In ternist | Private Practices, Round Rock and Killeen | The link between atopic disease states, the role of the autonomic nervous system and inflammation |
| 13 Apr | Ms. Carolina Boet | Southwestern University | Capstone Presentation. Title to be announced. |
| 20 Apr | Dr. Veronica Martinez Postdoctoral Fellow | UT Austin Section of Neurobiology | Drosophila model of Lou Gherig's Disease |
| Fri 28 April | Ms Kim Chau Graduate Student | Texas Tech University HSC | TBA <i>BRING YOUR LUNCH OR GO TO LUNCH (FREE!) WITH SPEAKERS AFTER TALKS!</i> |



***All BIOLOGY STUDENTS should make
a very strong effort to attend
The Biology Seminar Series
12:00 THURS in Room 148***