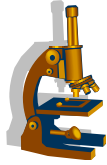


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Southwestern University

DEPARTMENT OF BIOLOGY

NSF Grant seeks to provide International Research Experience for SU Students Studying Apple Snails

Top Panel, Left to Right: Megan and Allyson taking a break to sightsee in Piriopolis.; a female apple snail, *Pomella megastoma*--- different genus and species than the apple snails studied at SU but closely related; Megan taking in the conversation between Hawaii researcher and mentor Dr. Ken Hayes and Uruguayan scientist Mariana Meerhoff. **Bottom panel, Left to Right:** Look at the rock pool habitat alongside the Uruguay River; Large clutch laid by *P. megastoma*; 1st lunch with all the research scientists involved.



Biology majors sophomore **Allyson Plantz** and senior **Megan Rice** spent 2 weeks at the end of last semester meeting international scientists that study apple snails and scoping out future research opportunities for Southwestern students. They traveled to Tucuman and Buenos Aires in Argentina and then to Colonia and Montevideo in Uruguay. Their first week included attending the 4th international *POMACEA* meeting and the second week focused on grant writing as part of an NSF planning grant. The result of their efforts & time abroad will be submission of a \$150,000 grant to the International Research Experiences for Students (IRES) Program within the National Science Foundation in mid-February by **Dr. Romi Burks** to study all aspects of the family of apple snails, Ampullariidae. Partnered with two malacologists (i.e. scientist that studies snails) from the University of Hawaii, the grant (if funded) will provide money for 6-week research experiences (in either Brazil or Uruguay during winter break) for 3 SU students and 3 students from the University of Hawaii for the next 3 years starting at the end of 2011. ¹



Drs. Pierce and Burks Host 114th Annual Meeting of the Texas Academy of Science at St. Edward's University March 3 – 5, 2011

The Texas Academy of Science meeting will take place just down the road this year at St. Edward's University. The 2011 meeting will be led by **Dr. Ben Pierce** and TAS President. The leadership will then stay within the Southwestern Biology Department as **Dr. Romi Burks**, now the 2011 Program Chair and President-Elect, takes over the gavel at the end of the meeting. Several SU students from the Pierce and Burks lab will be giving presentations. At the deadline, the meeting received nearly 320 abstracts – a record!!

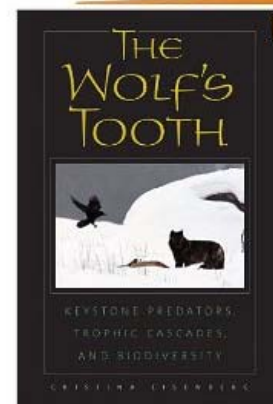
Interested in going?

Think SU Biology should have a TAS Chapter?

The bulk of the talks and posters take place on Friday, March 4th with workshops and socials on Thursday night (3/4) and Saturday morning (3/5). Membership in the Academy is only \$15 for students and a good investment in your future. Registration for the meeting and banquet (at the Bob Bullock Museum) amounts to another \$45. Students that present can be supported by Department funds. If other students are interested in the experience, please contact **Dr. Burks** and the Biology Department can partially support (\$30 split) an additional 10-12 students.



Click to **LOOK INSIDE!**



Biology Bookworm's Corner:

THE WOLF'S TOOTH
CRISTINA EISENBERG
ISBN: 1597263974
\$28.00

A little on the pricy side (check out the library or Dr. Burks has a copy) but very interesting tale from a wildlife biologist that touches on important ecological concepts such as trophic cascades.

<http://www.texasacademyofscience.org/>

SMArTeams RECRUITMENT – SEMESTER 9!
(longest running science civic engagement program at SU)
A Southwestern University & McCoy Elementary
Partnership
Spring 2010



**Sponsored by the Office of Civic Engagement and
the Department of Biology**

What is it? Monday afternoon program where SU students work 1-on-1 with a 3rd – 5th grader on a project of inquiry. Interested? Contact Day Coordinator, Meredith Liebl (lieblm@southwestern.edu)



For 2010-2011, the officers include:

President: [Cameron Clinton](#)

Vice-President: [Zach Freeland](#)

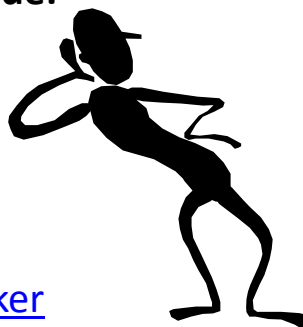
Treasurer: [Mallory Forsyth](#)

Secretary: [Katlyn Hoover](#)

Volunteer Coordinator: [Alex Lam](#)

Pre-Med Coordinator: [Rachel Baker](#)

*Did you
hear this
news?*



SU has launched a fund-raising campaign to build a new Science Center. Planning for this new facility has been underway for the past two years. Plans call for the addition of 37,000 square feet of new space to the existing science building, and the original Fondren Science building (constructed in 1954) will be completely redesigned & reconstructed to create a modern, integrated science facility. The new Science Center will house all of Southwestern's Natural Sciences Division, including biology, chemistry, kinesiology, mathematics and computer science, and physics. Estimated cost of the new and reconstructed building, along with new instrumentation, is \$25 million, making this the largest single capital project in Southwestern's history₃



Looking for Summer Research Experiences?



National Science Foundation
WHERE DISCOVERIES BEGIN

http://www.nsf.gov/crssprgm/reu/list_result.cfm?unitid=5047

EXAMPLES ON THE ECOLOGY AND EVOLUTION SIDE:

- REU in Chemical Ecology:
 - Georgia Tech – Atlanta **Deadline: Feb. 15, 2011**
www.biology.gatech.edu/undergraduate-program/reu
- REU – Rural-Urban Interface
 - University of Akron – Ohio **Deadline: Feb. 18, 2011**
<http://www3.uakron.edu/biology/fieldstation/reu.htm>,
- Austin Switchgrass Summer Research Program
 - University of Texas – Austin **Deadline: March 15, 2011**
- 2011 Sevilleta LTER Research Experience for Undergraduates
 - University of New Mexico **Deadline: Feb. 27, 2011**
<http://tierra.unm.edu/forms/reu-program-application>
- Mountain Lake Biological Station
 - University of Virginia **Deadline: Feb. 20, 2011**
<http://www.mlbs.org>

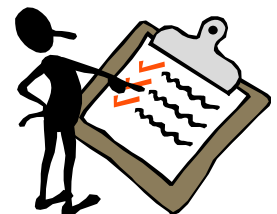


Contact: Dr. Tom Juenger
(tjuenger@austin.utexas.edu)



Don't Delay – Talk to Your Advisor Today!

Think about personal statements!



**Consider best sources of recommendation letters
(see advice next page)**

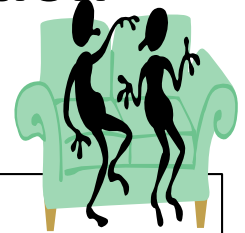
ON THE CELL AND MOLECULAR SIDE:

- 2011 "Cancer Prevention Education: Student Research Experiences **Deadline: Feb. 28, 2011**
– MD Anderson Cancer Center www.CancerPreventionTraining.org
- Methodist Hospital Research Institute
 - Methodist Hospital, Houston **Deadline: Feb. 14, 2011**
– <http://www.methodisthealth.com/tmhri.cfm?id=38787>
- Summer Undergraduate Research Fellowship Program (SURF)
 - UT Southwestern in Dallas **Deadline: Feb. 9, 2011**
– <http://www.utsouthwestern.edu/utsw/home/education/surf/index.html>
- Texas A&M Health Science Center
 - College of Medicine, College Station **Deadline: Feb. 18, 2011**
– <http://medicine.tamhsc.edu/research/student/summer-undergrad-program.html>

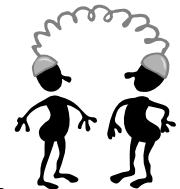


News Flash – Biology Faculty spend LOTS of time writing letters of recommendation

*(and are happy to do so!
Still you can help us out!)*



- Make 1st requests in person by scheduling an appointment.
 - Similar follow-up requests can be done professionally through e-mail.
- Best case scenario – Give your faculty **1 month notice** of your need for a letter. **Keep in mind that there are many more students than faculty.** Anything less than two weeks is pushing the envelope – so to speak.
- Casually send friendly reminders to faculty **1 week before the deadline.**
- Come prepared to the meeting with your purpose in seeking a letter of recommendation and a clear description of your program.
- **ASK THE QUESTION** – “Dr. So & So – would you be able to write me a **strong** letter of recommendation?”
 - Feel OK if the faculty members answers “well, probably not so strong
 - in comparison to other students.” Better to know this upfront and find
 - a better letter writer.
- Electronic letter or paper - **Provide the full contact information** including name, title and full address (department, street, city, state, zip) for every request in an electronic format so the faculty can cut and paste. Letters still have addresses at the top of them even if submitted electronically.
- If your request requires a paper copy, no need exists for you to provide an envelope and postage. The letter will go through Southwestern with your tuition dollars at work for you.
- **For multiple requests, create a summary** of the letters needed, contact information, deadlines and type of recommendation (on-line or paper).
- Choose the right person to write a letter. **Ideally, this faculty member knows more about you than simple class performance.** Provide “talking points” for the faculty to highlight your strengths.
- Send a thank you card. Faculty like and collect these.



BIOSCOPE FOCUS: Pedagogical & Scholarly Updates



ADVANCED

► PHYSIOLOGICAL ECOLOGY | Lead Editor: Irwin Forseth



Effects of Rising Atmospheric Concentrations of Carbon Dioxide on Plants

By: Daniel R. Taub (Biology Department, Southwestern University) © 2010 Nature Education

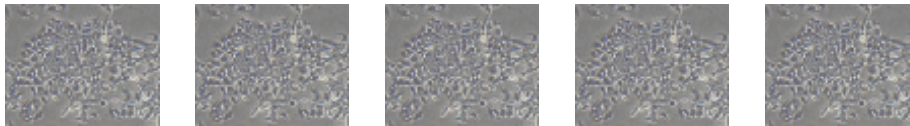
Citation: Taub, D. (2010) Effects of Rising Atmospheric Concentrations of Carbon Dioxide on Plants. *Nature Education*

Knowledge 1(8):21

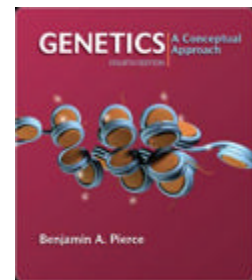


Photosynthetic assimilation of CO₂ is central to the metabolism of plants. As atmospheric concentrations of CO₂ rise, how will this affect the plants we depend on?

**Dr. Max Taub publishes CO₂ review for students in new peer-review *Nature Knowledge* site! Check it out!!
Everyone should LIKE this on Facebook and publicize SU Biology.**



Dr. Ben Pierce has done it again! 4th edition of his *Genetics* textbook hits the shelves.



**Cancer Cells Are Not the Only Thing Growing...
Drs. Todd-Cuevas-Sheller Collaboration Expands *The Terrific Trio*:** Collaboration connects colleagues to combat cancer cells. See great story about collaborative research among Drs. Todd, Cuevas and Sheller in *SU Magazine* on pg 30. & more about their recent progress on pg. 8 of this issue.



Apple Snail Ecology Lab Scores Small Grant Money!

Dr. Burks has received \$2000 from the Sam Taylor Fund of the United Methodist Church to analyze stable isotope samples of snails and their potential food sources. Sophomore Allyson Plantz received \$800 from a small national Grants-in-Aid award from *Sigma Xi* to set up a permanent habitat for red-ear slider turtles that may act as a predator of different life history stages of apple snails.



Department BUZZ

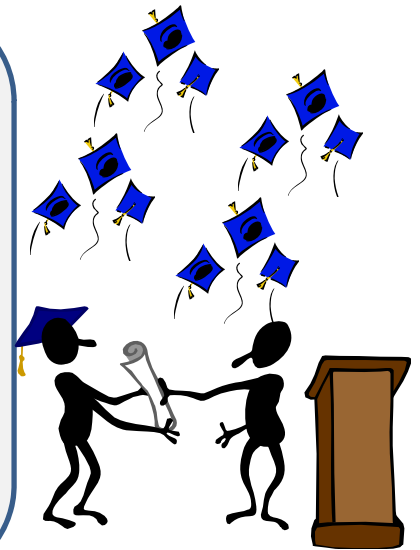



Dr. Erica Borden

Erika Borden is a new Part-Time Assistant Professor in the Biology Department. This semester she is teaching Introductory Molecular Biology, Genes and Molecules Lab, and Genetics and Evolution Lab. She earned her PhD in Microbiology from North Carolina State University where she studied bioremediation. Before teaching at Southwestern, Erika spent four years at Georgetown University in Washington, D.C. as a Laboratory Assistant Professor. She is super excited to be back in the classroom and to share her enthusiasm for biology!

Ready for Graduation? You should be thinking about your Biology Capstone!
What's this?

An *integrated experience* that you gain by taking upper level courses across our curriculum, incorporating the knowledge and skills you gained in introductory sequences & figuring out how to connect the dots.



	SEMINAR	Friday at Noon January 21 Dr. James Musser M.D. & Ph.D.	Come learn about research opportunities with Methodist Hospital AND epidemics caused by flesh eating bacteria!!!
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2 Student Researchers Wanted in the Apple Snail Ecology Lab

In anticipation of a large grant funding as well as a number of "new" directions in the lab, the Apple Snail Lab would like to **recruit 2 new student researchers** this semester. **CONTACT ASAP DR. BURKS IF INTERESTED.** Students will have the opportunity to develop a research question of their own surrounding the general topic of apple snail ecology (i.e. growth, reproduction, feeding preferences, predation, defense, behavior, etc...) but will also help with on-going experiments and preparation of stable isotope samples for analysis. In addition, undergraduate researchers **may have the opportunity to conduct summer research or research in South America** (Uruguay or Brazil) over winter break (Dec 2011 - Jan 2012) contingent on funding.



How Quickly Time Flies: A Collaboration 1 Year Later

ABSTRACT SUBMITTED TO THE AMERICAN ASSOCIATION OF CANCER RESEARCHERS! ! *Expression and sub-cellular localization of claudin-4 in MCF-7 breast and HEC-1A endometrial cancer cell lines.*

EQUIPMENT PURCHASED!! We first acquired a phase contrast microscope equipped with digital camera; and a automatic cell counter with funds from the NSF-MRI grant awarded to Todd and Cuevas. We recently purchased the 3rd piece of equipment; bench-top Accuri C6 flow cytometer that measures amounts of DNA in cells

--among other things! Ask Dr. Todd all about it.

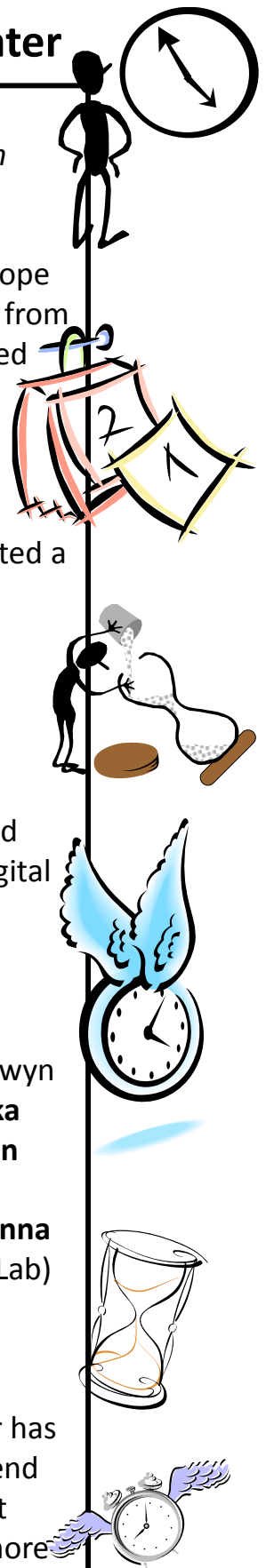
NEW GRANT IN THE PIPELINE!! Todd, Cuevas and Sheller have submitted a grant proposal to ACS Andrew Mellon Faculty Renewal Program titled: *Application of new techniques by intra-institutional collaboration to investigate the role of claudin-3 in breast cancer metastasis.*

- To enhance an existing institutional collaboration between biologists from 3 different sub-disciplines of Cancer Genetics, Endocrinology & Neurophysiology.
- To become proficient in the use of the following newly acquired instrumentation: FlowCytometer, Phase-contrast microscope/digital camera and Automatic Cell Counter.
- To learn, optimize and execute cell cycle, motility and invasion assays using the above instrumentation.



Back row from left to right: Bronwyn Tyler (Todd Lab), MT, **Jenna Gaska** (Cuevas Lab), **Amanda Thompson** (Todd Lab), ME, Andrea Holland
Front row from left to right: **ReAnna Jacob**, RS, **Heather Petty** (Todd Lab)

MORE STUDENTS!! The collaborative endeavor of Todd-Cuevas-Sheller has devised new ways of fully engaging undergraduates students. To that end we have four new undergraduate research students joining our current two. **Andrea Holland** (senior-Cuevas lab) and **ReAnna Jacobs** (sophomore Sheller's lab).












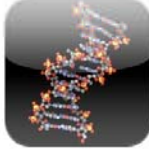
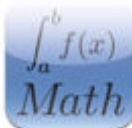






Got this Ap? Examples from *iTunes* Science Fused with Technology

FREE

COST \$\$

 <p>Nature and Science Stay up to date with the latest discoveries across all science disciplines.</p> 	 <p>iBird Explorer Backyard \$2.99 This interactive field guide lets you search North American birds by color, shape, habitat, and location.</p>
 <p>Convert Units for FREE Quick way to make sure you use those SI units!!</p>	<p>\$2.99</p> <p>Star Walk - \$0.99 Star Walk's built-in compass knows where you are in the universe.</p> 
<p>Google Earth- FREE Hold the world in the palm of your hand. Explore the same global satellite including high-res imagery for over half of the world's population</p> 	 <p>Butterfly Collection - \$1.99 This application showcases 240 species.</p>
 <p>iFormulas - FREE Always forget how to calculate the area of a circle? No problem – just look it up in this cool ap.</p>	<p>My Nature Animal Tracks - \$6.99 Digital photos, illustrations, and range maps for over 40 animals — big and small — help you identify tracks based on size and shape.</p> 
 <p>The New York Times- FREE Has the best science section of any US newspaper. Issued every Tuesday.</p>	<p>Periodic or Periodic Table- \$0.99 -Have the complete periodic table at your fingertips.</p> 
<p>Molecules - FREE Allows 3D viewing of different molecules – great for those organic chemists!</p> 	 <p>Math Ref- \$0.99 Great general overview – there is a FREE version as well but the upgrade is worth \$0.99</p>
 <p>3D Brain - FREE Users select a color-coded part of the brain and receive an overview, including case study. Done by Cold Spring Harbor.</p>	<p>Wolfram Alpha \$1.99 Find out information about a world of different things</p> 

Editor's Note: These applications serve only as examples. The Biology Department does not endorse iPhones over any other "smart" or "dumb" phone and certainly does not permit use of any such applications in an unethical manner.

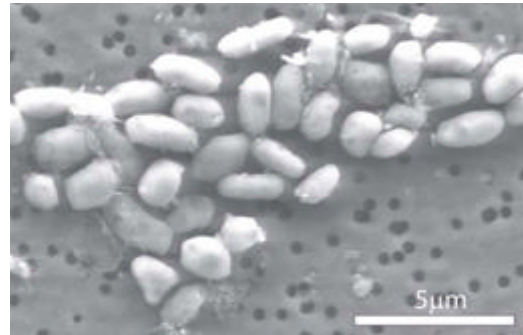


Learn something new from **BioScope Magnifications:**

Life changing discovery....or flawed science?

One of the basic assumptions about life on Earth may be due for a revision. Scientists may have discovered a type of bacteria that thrives on poisonous arsenic, potentially opening up a new pathway for life on Earth and other planets.

Most biologists will tell you that these six elements are essential; life as we know it cannot exist without them.: carbon, hydrogen, nitrogen, oxygen, phosphorus and sulfur, or CHNOPS. The recent discovery by Felisa Wolfe-Simon of an organism that might utilize arsenic in place of phosphorus, however, could indicate that life can form in the absence of large amounts of available phosphorous, thus increasing the probability of finding life elsewhere.



This scanning electron micrograph shows a strain of the arsenic-eating bacterium called GFAJ-1. Credit: Science/AAAS



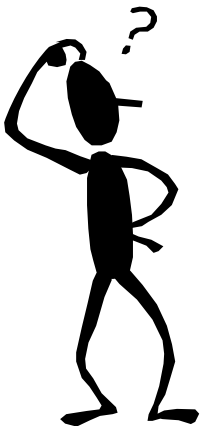
Recently discovered arsenic eating bacteria were scraped from the bottom of Mono Lake in California. Credit: Jesse Allen

The organism in question is a bacterium, GFAJ-1, cultured by Wolfe-Simon from sediments she and her colleagues collected along the shore of Mono Lake, Calif. Mono Lake is hypersaline and highly alkaline. It also has one of the highest natural concentrations of arsenic in the world. According to the results of 16S rRNA sequencing, the rod-shaped GFAJ-1 nestles in among other salt-loving bacteria in the genus *Halomonas*. Many of these bacteria are known to be able to tolerate high levels of arsenic. But Wolfe-Simon found that GFAJ-1 can go a step further. When starved of phosphorus, it can instead incorporate arsenic into its DNA, and continue growing as though nothing remarkable had happened. So far we've showed that it can do it in DNA, but it looks like it can do it in a whole lot of other biomolecules as well, says Wolfe-Simon, a NASA research fellow in residence at the USGS in Menlo Park, California.



To confirm that this arsenic was being incorporated into DNA, she used a well-accepted molecular biology technique known as gel purified DNA extraction to isolate and concentrate DNA from GFAJ-1 cells. The value of this technique is that it ensures that no other material from the cell comes along for the ride. NanoSIMS measurement of these concentrated DNA extractions showed that arsenic was indeed present in their DNA. Besides this technique, every experiment Wolfe-Simon performed pointed to the same conclusion:

GFAJ-1 can substitute arsenic for phosphorus in its DNA. WEIRD.



But some scientists, such as Steve Benner, a distinguished fellow at the Foundation for Applied Molecular Evolution in Gainesville, Fla., remain skeptical. If you replace all the phosphates by arsenates, in the backbone of DNA, he says, every bond in that chain is going to hydrolyze [react with water and fall apart] with a half-life on the order of minutes, say 10 minutes. So if there is an arsenate equivalent of DNA in that bug, it has to be seriously stabilized by some as-yet-unknown mechanism. Perhaps the trace contaminants in the growth medium Wolfe-Simon uses in her lab cultures are sufficient to supply the phosphorus needed for the cells DNA. He thinks it's more likely that arsenic is being used elsewhere in the cells, in lipids for example. Arsenate in lipids would be 10 stable, said Benner, and would not fall apart in water.