

**NEW COURSE TAUGHT THIS FALL:  
Associate Professor Dr. Martín Gonzalez offers  
Immunology Course**

In an era of immuno-suppressive diseases and increased sensitivity, Immunology spans many areas of biology. This course provides an introduction to the immune system as studied in mammals. The course focuses on humoral and cell-mediated immune responses and deals with the cellular and biochemical mechanisms involved in the education and regulation of both immune responses. 17 students chose to take advantage of this new opportunity.

Abby Youens '06 and Dr. Romi Burks publish 1<sup>st</sup> paper with morphological data from Texas applesnails, *Pomacea insularum*. Abstract from *Aquatic Ecology* appears below (on-line soon):



\*not to scale

Aquat Ecol  
DOI 10.1007/s10452-007-9140-0

ORIGINAL PAPER

**Comparing applesnails with oranges: the need to standardize measuring techniques when studying *Pomacea***

Abigail K. Youens · Romi L. Burks

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**Abstract** Although invaders come in all shapes and sizes, several mollusks have recently achieved notoriety as both economically and ecologically costly invaders. Applesnails of the genus *Pomacea* get their name from reaching the size of an apple. Native to South America, the species *P. insularum* has recently established by reproducing, and potentially invasive, populations in Texas, Alabama, Georgia, and Florida. In contrast to the widely invasive golden applesnail (*P. canaliculata*), a few studies of the channeled species *P. insularum* exist. In studying similar invasive applesnail species, scientists use several methods of measurement. We have explored the relationships among shell height, operculum width, and weight among juvenile and adult *P. insularum* and tested their inter-measurer reliability. We also investigated the use of shell height, shell length, and operculum width measurements in *P. canaliculata* studies and observed whether or not those studies defined their measurements. We found that operculum width served as a significantly more reliable measure among researchers. Furthermore, operculum width better predicted weight than shell height. The majority of articles that measured *P. canaliculata* did not define their measurements, which may cause problems when comparing studies between native and exotic

populations or when comparing the two species. We recommend that future studies of *P. insularum* use operculum width to measure snails and explore a possible sex dimorphism in the operculum width of adult *P. insularum*.

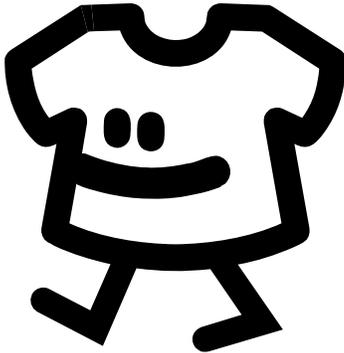
**Keywords** Exotic · Invasive · Operculum width · *Pomacea insularum* · *Pomacea canaliculata* · Shell height

Introduction

In 1958, ecologist Charles Elton recognized that we live in a "very explosive world" where many exotic species successfully invade (Elton 1958). The magnitude of introductions continues to increase with globalization, changing land use and climate change (Pimentel et al. 2005). Levine and Antonio (2003) predicted that the number of invasive species in the United States would increase logarithmically as trade barriers open up around the world. Although invaders come in all shapes and sizes, several mollusks, including zebra mussels (*Dreissena polymorpha*), Asian clams (*Corbicula fluminea*) and the Asian freshwater mussel (*Limnoperna fortunei*) have



# BetaBetaBeta



Many of you expressed interest in creating Tri-Beta t-shirts at our last meeting. We decided to have a t-shirt design contest and vote for the best design. Designs can be turned in to Dr. Cuevas' office or emailed to me at [kauffmam@southwestern.edu](mailto:kauffmam@southwestern.edu) no later than Friday, October 19.

Our next meeting is scheduled to be Tuesday, October 23 at 11:30am. At this meeting, we will be voting for the best design. Also, we will be discussing future service opportunities as well as answering any questions about spring registration.

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## DO NOT FORGET: HABITAT for HUMANITY BUILD DAY

**When:** Saturday, October 27

**Time:** 7:30am-3:30pm OR just a few hours in the am or pm

**Where:** Georgetown (details TBA)

**Why:** to help a family in need, to get your volunteer hours for BBB, to get free lunch, to bond with fellow biology nerds, to feel good about yourself, etc.

Email

[hoeraufa@southwestern.edu](mailto:hoeraufa@southwestern.edu) by

10/17



Each Fall, Tri-Beta 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.

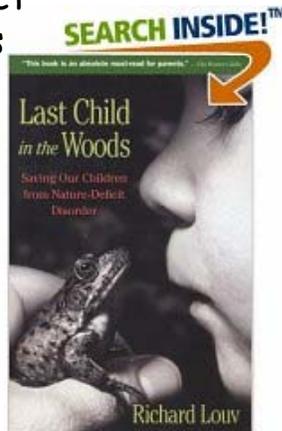
Students who do not yet meet these requirements, but who have an interest in Biology are inducted as Associate Members.

*Faculty Sponsor: Dr. Cuevas with support of the entire Biology Dept.*

# Advice from a BookWorm:

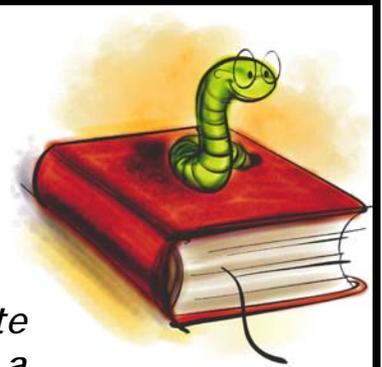
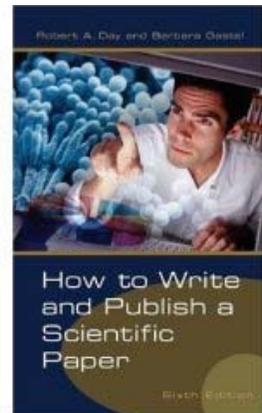
*The Last Child in the Woods, Saving our Children from Nature-Deficit Disorder* by Richard Louv

Recommendation by Adjunct Faculty Laura Leites "[This book] emphasizes the importance of nature and those students with any interest in Environmental Science will find it worth reading."



*How to Write and Publish a Scientific Paper* by Day and Gastel

Dr. Maria Todd says this is her new favorite book. A classic with great up to date information!



## **BIOSCOPE FOCUS: Pedagogical & Scholarly Updates**



- This semester brought the Biology Department another publication in the work of Dr. Ben Pierce:
  - Pierce, Benjamin A. and Kevin J. Gutzwiller. 2007. Interobserver variation in frog call surveys. *Journal of Herpetology*, 41:424-429.
- In November, Dr. Rebecca Sheller will be presenting a poster, "Biology of perception for non-biology undergraduates" at the Society for Neuroscience annual meeting in San Deigo, CA.
- Dr. Romi Burks will travel to her undergraduate alma mater, Loyola University Chicago, in November to participate in an Alumni Advisory Board.
- Dr. Ben Pierce along with an across campus University Committee has completed a \$1.6M proposal for the Howard Hughes Medical Institution. Invitations for this type of grant only occur once every 4 years.
- The Department continues to be involved in large campus initiatives as Dr. Maria Cuevas has had a great start this Fall with her new Paideia group.
- Co-authored with students Kristen Meerbrey '05 and Shea Spruill '07, Dr. Maria Todd will present "siRNA-mediated suppression of the wildtype and low molecular weight forms of cyclin E protein in the NIH-OVCAR-3 ovarian cancer cells" at the 2007 American Society of Human Genetics Meeting to be held in San Diego. She will also be attending the Lost Pines Conference with students.

## Southwestern Biology Majors Involved with Conserving the Environment Featured on the Web

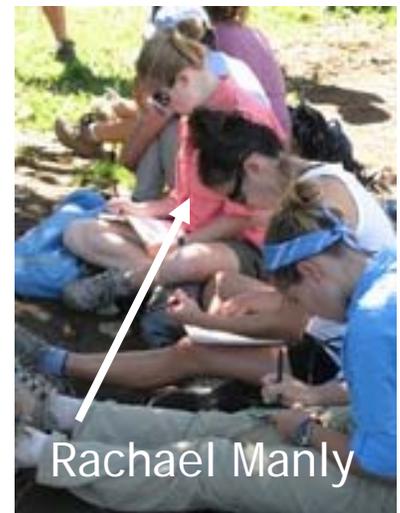
### Top 20 Things Anna Frankel learned during her summer as an Intern with Sea Turtle, Inc.

1. Some of the most unique & passionate people in the world work w turtles.
2. Talking to animals doesn't make you crazy, it makes you involved.
3. You can never be too old or too cool to feed a sea turtle, or to stick your head in our turtle cutout.
4. Each sea turtle has a very distinct personality, which means that sometimes they like someone else more than you.
5. Living in a trailer is totally worth it when you live on the beach.
6. If you wear a sea turtle patrol shirt in public someone will, without a doubt, stop you and ask when the next hatchling release is.
7. Most people will never understand that we can't make the babies hatch any faster just because their vacation ends tomorrow.
8. The beach look (unkempt hair, no make up, slight tan) suits me.
9. Watching a hatchling release makes all of the beach patrols worth it.
10. There will probably never be attractive people on the SPI nude beach.
11. As Jill said before, cows also enjoy gazing into the ocean to ponder the meaning of life.
12. Mosquitoes will inevitably bite you if you are out after dark.
13. Downpours on SPI happen unexpectedly and then end just as quickly.
14. When 5 interns work together in the morning we can finish all the morning chores by 9:15, which lets us sit down and enjoy our coffee.
15. Speaking of coffee, people always think it's funny that I walk around releases with a baby in one hand and coffee in the other. **Apparently they still haven't grasped that college students never see 6:00 am.**
16. Really cooking in a trailer is nearly impossible and it's almost always necessary to disconnect the smoke alarm first.
17. On tours people are always shocked when they're told that poaching nearly wiped out sea turtle populations. What they have a harder time understanding it that just like any doctor, biologist or surf instructor all they were trying to do was support their family.
18. **One of the most important aspects of sea turtle conservation is education.**
19. The SPI experience is much more enjoyable if you visit the unique shops and restaurants run by local entrepreneurs (i.e. Badabing Bagels, Naturally's, The Museum, Seagull Imports, Paradise Gems, K?s Beads) instead of the big souvenir places.
20. No visitors to STI can ever ask too many questions or too silly of a question. Education is education and if they learn to love sea turtles I did my job.



Anna Frankel

<http://www.southwestern.edu/cgi-bin/newsroom/article.cgi?id=22>



Rachael Manly

### Reflections from Rachael Manly's Study Abroad with SFS

This week we took a trip to explore Carara National Park and the Tarcoles River. As a biology major, I am interested in Costa Rica's ecology and have really enjoyed seeing the material I have studied up close. Carara provided many animal sightings, such as capuchin monkeys, a basilisk lizard, agoutis, and leaf-cutter ants. However, the scarlet macaws were the most incredible sighting of the day. Their vibrant colors and lively calls were awesome to witness, and we saw many pairs flying overhead during our stay. As a contrast to the complete beauty of Carara, we hiked down the polluted shores of Playa Azul. The Tarcoles River meets the ocean at Playa Azul, bringing with it the pesticides, biological waste, and trash of the Central Valley. As we walked down the beach I could imagine what the once pristine waters must have looked like. The shocking contrast of the two areas served as a reminder of the necessity for conservation of natural environments, and the worthwhile efforts of SFS students to better understand these issues.



# Biology in the news...

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## The appendix does have a use?? - re-booting the gut



For generations medical orthodoxy has maintained that the appendix is useless, warranting attention only for its tendency to become painfully inflamed and requiring swift removal. But now the reputation of this cul-de-sac in the human gut has been rehabilitated by a theory from a team of immunologists. The US scientists found that the appendix acted as a "good safe house" for bacteria essential for healthy digestion, in effect re-booting the digestive system after the host has contracted diseases such as amoebic dysentery or cholera, which kill off helpful germs and purge the gut. This function has been made obsolete by modern, industrialized society; populations are now so dense that people pick up essential bacteria from each other, allowing gut organisms to regrow without help from the appendix, the researchers said.

## Biologists claim Nobel prize with a knock-out

Architects of mutant mice are rewarded for their work. The architects of a technique that has allowed biologists to identify the function of genes easily have been rewarded for their efforts with this year's Nobel Prize in Physiology or Medicine. The technique allows researchers to generate 'knock-out' mice - mutant strains in which specific genes are disabled. These can be used to establish what role specific genes have in health, development and disease, and to create animal models of human diseases.

"Virtually no field of biomedicine has been untouched by one knock-out strain or another in a significant way," says Jeremy Berg, director of the National Institute of General Medical Sciences in Bethesda, Maryland. Mario Capecchi AP Photo/Douglas C. Pizac Mario Capecchi from the University of Utah in Salt Lake City, Martin Evans of Cardiff University in Wales and Oliver Smithies of the University of North Carolina at Chapel Hill, share the €1.1-million (US\$1.5-million) award. From [www.nature.com](http://www.nature.com)



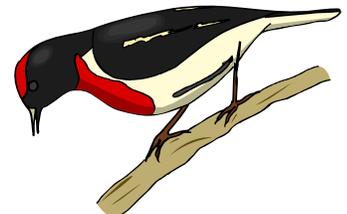
## A Little Bird Told Me

*Alex the Parrot died last week at the age of 31. If Alex were a dog, he would be 189 years old. But he's a parrot and he's 27. In parrot years that's 27. Unless Alex chokes on a nut or falls out of his cage, he should live another 50 years. In a perfect world, healthy parrots can live 80 to 90 years. Dr. Irene Pepperberg found Alex in a Chicago pet store near O'Hare Airport when he was a year old. He was one of eight birds sitting in a cage, waiting to be adopted. There was nothing special about Alex that caught Pepperberg's eye. She needed a bird and simply told the storeowner to reach in and pick one out. Bird in hand, Pepperberg returned to her lab at Purdue University to begin her research. And so began Alex's career as the world's smartest parrot.*

[www.seedmagazine.com/news](http://www.seedmagazine.com/news)

## Two Different Species Determined by CA Scientists

These two Ivory-Billed Woodpeckers were collected in 1894 and now reside in the Academy's ornithology collection. Nearly 70 percent of the museum's 92,000 bird specimens were collected prior to 1925, making the collection a very valuable resource for historical data. Through DNA testing, California Academy ornithologist Jack Dumbacher has found that some birds previously assigned the same name are actually separate species. Two birds fly through the jungles of Papua New Guinea, sporting very similar plumage. Although they have historically been classified as two members of the same species, they inhabit separate parts of the island, and recent DNA testing has shown that they share only 92 percent of their genetic code. These two animals are therefore twice as different from one another as humans and chimps, which are a 96 percent genetic match. Clearly, this new data indicates that the birds should be reclassified as two distinct species. What may not be as readily apparent, at least to non-scientists, is why a known bird receiving a new name should be a noteworthy occasion. "Biodiversity is disappearing from our planet at an astonishing rate," says Academy curator Dr. Jack Dumbacher. "If we're going to make informed decisions about how to halt that trend, we need to understand how biodiversity is distributed across the planet. Accurately naming new species and subspecies helps us to create a more meaningful map of biodiversity distribution."



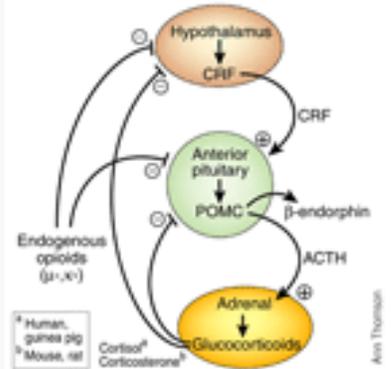
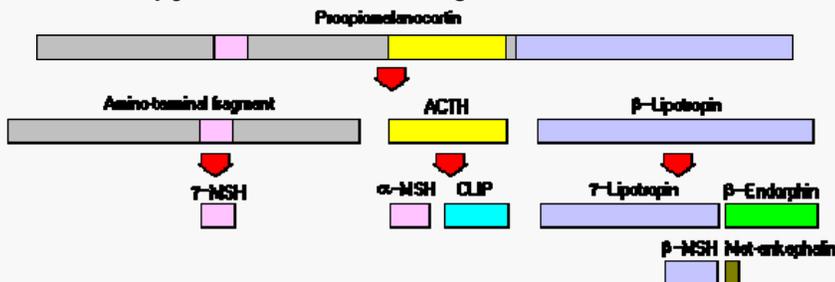
Thanks to Dr. Cuevas for providing this issue's choices!



## Learn something new from BioScope Magnifications:

- **MOLECULE and PATHWAY:  $\beta$ -endorphin**

Belongs to a group of peptide hormones with pain-relieving properties that are naturally found in the brain. Endorphin binds to opiate receptors to reduce our perception of pain similar to morphine and codeine. However, the body's release of endorphins does not lead to addiction. The release of endorphins is different on each individual. Certain foods such as chocolate and chili peppers can lead to enhanced production of endorphins. Strenuous exercise, massage therapy and acupuncture can also stimulate endorphin production. Maybe that is why eating chocolate and massage therapy makes us feel so good.



- **ORGANISM: *Pyrodinium bahamense***

Dinoflagellates are microscopic, unicellular, flagellated, often photosynthetic protists, commonly regarded as "algae" (Division Dinoflagellata). Species, *Pyrodinium bahamense* (Greek for "whirling fire"), are photosynthesis using plankton. They are one celled and measure about 1/500<sup>th</sup> of an inch. The tiny burst of light it gives off is a hundred times bigger than itself. Each dinoflagellate bursts into light when it feels pressure against its cell wall.

- **ECOSYSTEM: Bioluminescent Bay (Flourescent Bay) in La Parguera, Puerto Rico**

To create a bioluminescent bay you need a lagoon surrounded by Red Mangroves (which occur in the tropics and semi tropics only). The roots of the red mangroves release tannins that are rich in Vitamin B12, one of the important nutrients for these light emitting dinoflagellates. The Bay must also be relatively free of pollution, water needs to stay relatively cool in the daytime but remain warmer than the ocean outside. It also requires a restrictive channel to the ocean, with a relatively small tidal exchange. In Puerto Rico there are three bioluminescent bays: La Parguera, Fajardo and Vieques.

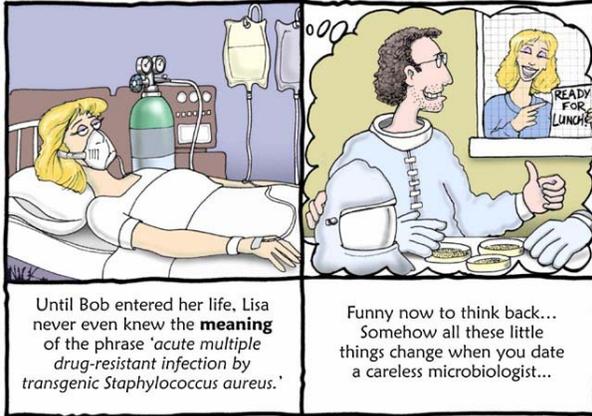


# Funnies From Across Biology Subdisciplines

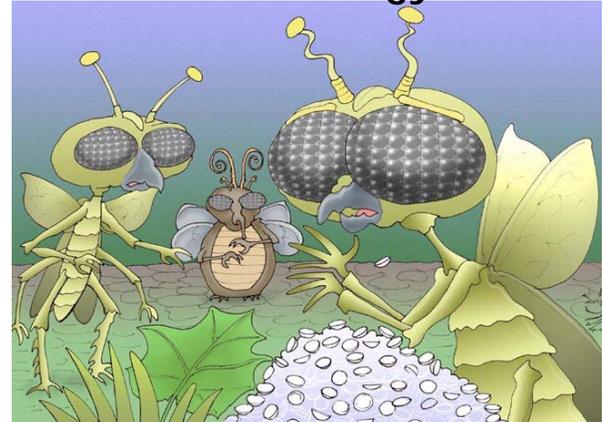
(courtesy for [www.nearingzero.net](http://www.nearingzero.net))



## Microbiology



## Entomology



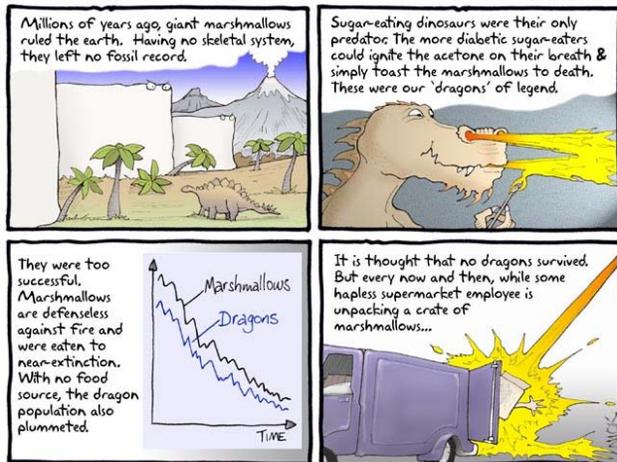
"Nobody move! I've dropped my contacts!"

## Endocrinology



"Have you seen that weedy little rat that we're using to test out our new growth hormone.?"

## Evolution

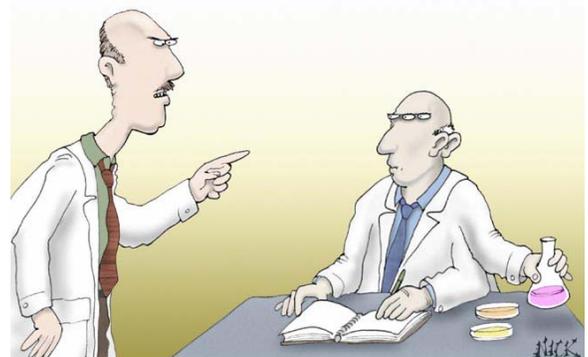


## Neurobiology



"Such a pity you couldn't find your way through the maze to deactivate my doomsday rocket, Mr Bond. Perhaps now you'll admit that you're not as clever as a well-trained lab rat."

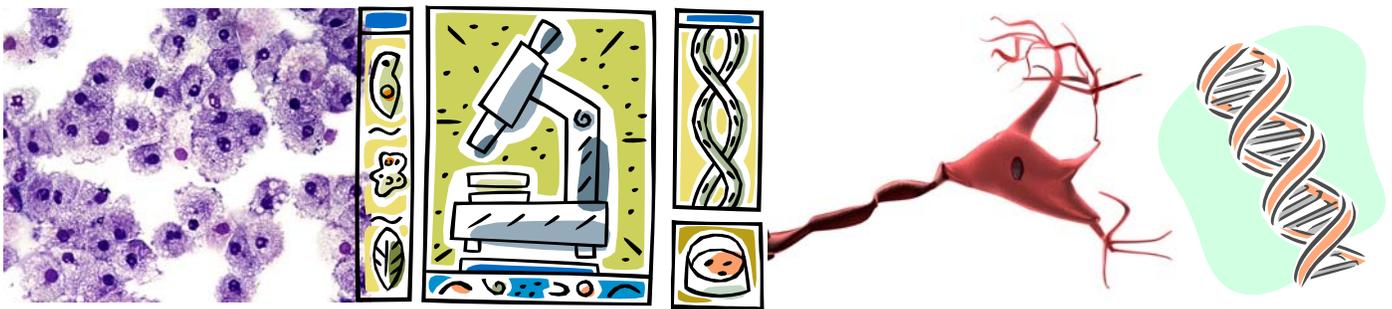
## Developmental or Molecular Biology



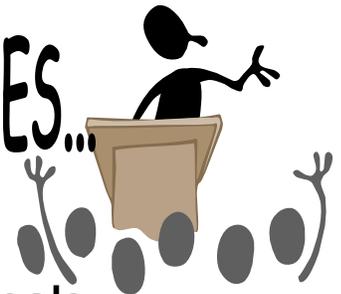
"You're a selfish bastard, Lewis! Those stem-cell lines were meant for people who've LOST an organ!"

# ANNOUNCEMENTS

*The Biology Department is very sorry to see technician Chris Pomajzl move to a position as head of the histology laboratory at the new Seton Medical Center Williamson County (although we are also very happy that this is such a great opportunity for him...plus we might be able to swing some cool lab tours!) Chris has been a great addition to the Department and has made incredible strides in organizing our department! October 19<sup>th</sup> is his last day.*



## BIOLOGY SEMINAR SERIES CONTINUES...



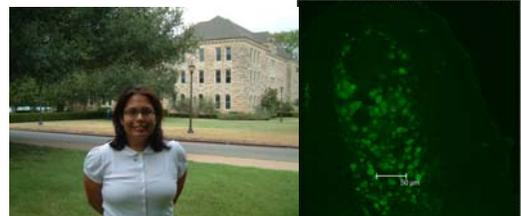
Keep a look out for fliers! Thurs @ 12

### Fluorescence Confocal Microscopy Reveals Stem Cells in Glowing Worms

Emily Schmidt '07 and Visiting Professor Dr. Veronica Martinez have been trying out techniques for feeding BrdU to an aquatic worm (*Lumbriculus*). Bromodeoxyuridine (5-bromo-2-deoxyuridine, BrdU) is an analogue of thymidine. When administered to dividing cells, BrdU is incorporated into newly synthesized DNA as a substitute for thymidine. We commonly use BrdU to determine the replicative state of a cell population or to determine the activity of a population of stem cells as in our studies with regeneration in *Lumbriculus*. And they recently found success (see attached image)! This is a project that will help answer some very basic developmental biology questions about the way that *Lumbriculus* regenerates and possibly provide us a vehicle for trying gene knockdown techniques like RNAi. No one has ever successfully developed this BrdU feeding technique in an annelid so, the technique in and of itself is worthy of publishing.

Do you like to write?  
Need a create outlet?  
Enjoy connecting Biology with other things?

Consider becoming involved in *BioScope!*  
Student writers and editors needed.  
Contact Dr. Burks ([burksr@southwestern.edu](mailto:burksr@southwestern.edu))

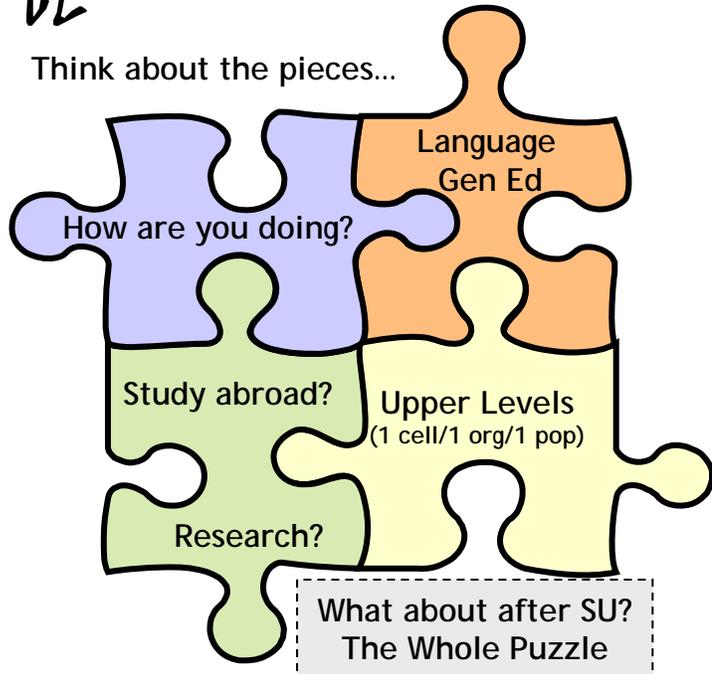




# Did You Know??

Advising for Spring Semester begins after Fall Break. Check with your advisor for an appointment. Registration begins October 24<sup>th</sup>.

Think about the pieces...



- 1<sup>st</sup> Year Sequence
  - Genes and Molecules (Todd)
  - Genetics and Evolution (Taub)
  - Labs (Southwick)
- 2<sup>nd</sup> Year Methods
  - Ecology (Burks)
  - Cell/Molecular (Cuevas)
- Upper-Levels (\* = possible capstone)
  - \*Genetics (Pierce)
  - \*Neurobiology (Sheller)
  - Comp Vertebrate Morphology (TBD)
  - Invertebrate Ecology (Burks)
  - \*Microbiology (Gonzalez)
  - Biochemistry 2 (Foote)
- Research and Internships



**Biology Majors Amanda Mohammed, Anna Frankel and Erica Navaira** have been leading this semester's SMARTeams (Science and Math Achiever Teams) under the direction of Dr. Burks. This program matches college students 1-on-1 with elementary school students to explore inquiry. The experience has also been developed into a 1 credit course in Civic Engagement with cooperation from Suzy Pukys.

The Animal Behavior Program will offer its new Intro course for the 2<sup>nd</sup> time this Fall. Last Fall, 15 students discovered more about the major and the research interests of the faculty involved. This semester sees an increase in enrollment to 25 students! The class is 1 PDF credit and will meet Tu/Th mornings starting October 30<sup>th</sup>. Any student interested in majoring in Animal Behavior should take this course, Introduction to Psychology and Statistics before their sophomore year. Enrollment in the Bio mini-courses is also recommended.

Round 2  
mini-courses start  
Fri. 10/19.  
Cell has lab this  
week.



The Biodiversity classes have participated in a pilot of a new on-line management system called Sakai. Besides being a place to post materials like Segue, Sakai also has an on-line quizzing function. It is still in the "test" mode but students seemed to enjoy the increased flexibility.



# Take a moment to think. Advising Time Approaches.



Come and talk to us. We're invested! Share plans!  
There's more to advising than just your schedule!



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