

Biology Scope

Issue 15:
Fall '08

Southwestern University DEPARTMENT OF BIOLOGY

Dr. Vicente Villa Returns to SU Biology

The Biology Department is excited to welcome back **Dr. Vicente Villa** to teach an upper-level course in Regenerative Biology and Medicine in the Spring 09 semester. Dr. Villa is an emeritus (retired) member of the Biology Department known for an EXTRAORDINARY enthusiasm for biology and unparalleled devotion to student learning. He has received awards for his teaching too numerous to mention (see <http://www.southwestern.edu/infocus/news/980519.html> for details). During his time as a regular faculty member his courses were always oversubscribed, and the opportunity to take a course with Dr. Villa is not to be missed.

Course description: **Regenerative Biology and Medicine**

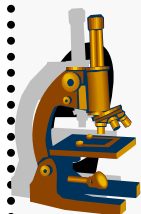


"If there were no regeneration, there could be no life. If everything regenerated, there would be no death. All organisms exist between these two extremes. Other things being equal, they tend toward the latter end of the spectrum, never quite achieving immortality because this would be incompatible with reproduction." -----Richard J. Goss, Developmental Biologist, 1969

The course will address the cellular and molecular mechanisms of tissue regeneration in a number of mammalian tissues. In addition, the regenerative medicine approaches to stimulate functional regeneration of damaged or diseased tissues will be considered in each case. Among the regenerative medicine therapies devised to stimulate functional regeneration will be the use of cell transplantation, bioartificial tissues and induction of regeneration *in situ*. The final section of the course will focus on research issues in regenerative medicine. The course will be an upper-level course recommended for junior and senior level students in the natural sciences.

Did you see the July issue of *Oncology Reports*?

The Biology Department hopes that you didn't miss this issue as it contains a new publication resulting from faculty/student collaborations. Kurt Seilheimer '07 participated in the 2006 Biology Summer Research Program with **Dr. Maria Cuevas**. Their research investigated effects of anti cancer drugs known as anthrapyrazoles in a variety of reproductive cell lines. It is a collaborative project with **Dr. Frank Guziec** from Chemistry/Biochemistry Department.



Upcoming!

βββ Meeting

Members & 1st Years Welcome

Wed 9/17 12pm 148

Questions, contact President

evansr@southwestern.edu

Fri 9/12 12pm 151

Animal Behavior Meeting

All current & potential majors/minors welcome

Questions, contact Student Rep

penlandj@southwestern.edu

Graduate School Panel

Th 9/11 noon*

*To sign up, email Career Services,

afca@southwestern.edu

**1st Biology Seminar
Series Talk
Friday, 9/12
12 pm 148**

Questions, contact

pierceb@southwestern.edu



an interview with Visiting Faculty Dr. Andrew Woodward

1. **Question: So, after 2 weeks, how it is going?**
 - Answer: In a word, great. I love my students, the courses that I teach cover fascinating topics, and Southwestern as a whole is a community with a lot to offer.
2. **Question: What do you like best about Southwestern students?**
 - Answer: Again, it can be summarized in a word: *curiosity*. I encourage my students to question everything: the textbook, hypotheses that I describe, and science stories in the popular media. In my experience, Southwestern students are happy to oblige. The most fun for me is when we get to discuss topics that hadn't even crossed my mind when preparing for class.
3. **Question: How is Southwestern similar or different than Rice where you did your undergraduate degree?**
 - Answer: Southwestern is much more focused on undergraduate education. SU students have the privilege of a degree of faculty attention and administration concern that I have never witnessed before. At Rice, there is a clear focus on attracting funding for successful research projects, and the faculty also spend a great deal of time on graduate student education. At SU, research is viewed more as a (very effective and engaging) teaching tool.
4. **Question: What 5 adjectives would you use to describe yourself?**
 - Answer: *energetic, self-effacing, generous, engaging, and food-loving (I think the students will vouch for this one, if nothing else.)*
5. **Question: What words of advice to you have for SU biologists?**
 - Answer: *I grew up on a ranch in a tiny Central Texas town. On top of ranch chores, I had several jobs as a young man: mowing lawns, mopping floors at the local grocery store, making pizzas in a "downtown" movie rental store, and growing and selling watermelons in the summer to save for college. I don't regret any of these experiences. Thinking back, I hope that professional biologists can keep perspective on what wonderful jobs we have-² learning, teaching, and daily interacting with motivated, curious, and diverse people.*



Biology Senior

Erica Navaira starts off SMArT



SMArTeams (Science and Math Achiever Teams) takes off on its 4th semester with its program of connecting college students with elementary students to work in pairs on projects of scientific inquiry. This Fall, 3rd – 5th graders from Cooper Elementary will come to SU on Monday afternoon to work with our 12 mentors:



- Sarah Ferraro
- Michael Balat
- Liz Delgado
- Victoria Phillips
- Sierra Perez
- Jesse Barbour
- Cheyenne Forney
- Megan Rice
- Mallory Forsyth
- Meredith Liebl
- Julia Von Alexander
- Tami Warner

What did you do with your summer?

Biology Senior Jessie Carrier bravely tackled the task of organizing the Biology Department

The Biology Department owes a great debt of gratitude to **Senior Jessie Carrier** who did supply inventories, equipment inventories, and MSDS sheets for each room and made a master copy consisting of 7 4inch binders (took an entire MONTH!). After that, she organized, cleaned, and labeled drawers/shelves/etc in all the rooms, discovered random biological objects from 50+ years ago and chased down faculty trying to identify them. With the direction of Biology Technician **Christy Schaller**, Jessie found her way to the the rock room on the 4th floor and also organized all the chemicals in the stock room, refilled about a billion pipette tip and helped with general care of the turtle, fish, toad, frogs, and plants. She got attacked by a rogue crawfish (no idea whose it was!), cut plexiglass for snail cages, battled high pressure water hoses when checking eyewashes and showers, and provided incredible service as a “Jack of all trades” in the Biology Department. Her efforts help all the faculty as well as all the students. Next time you see her, offer a pat on the back!

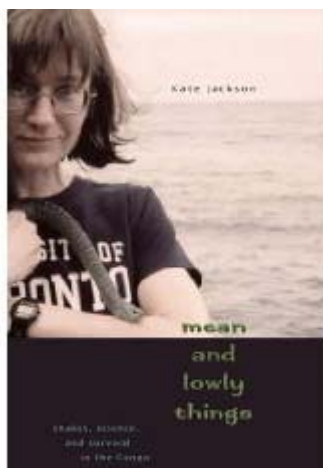


Ever wonder what a field biologist really does? Check these out:



Biology Bookworm

*Read any good books lately?
Submit a review to the bookworm!*



Mean and Lowly Things

ISBN 0674029747

A travel journey by a graduate student studying reptile and amphibian diversity DEEP in the heart of the Congo.

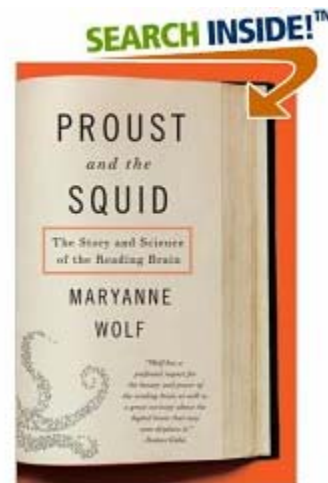
Stinging Trees and Wait A Whiles:

Confessions of a Rainforest

Biologist

ISBN 0226468968

In this amusing memoir, Laurance, a senior research scientist at the Smithsonian, recalls the 18 months he spent doing fieldwork for his dissertation in north Queensland, Australia.

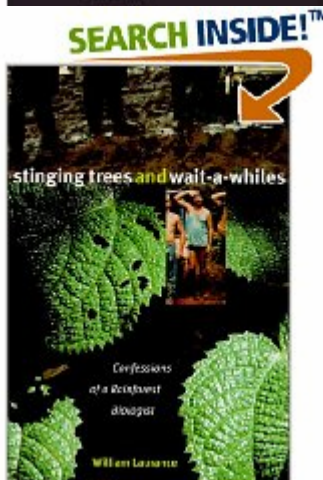


The Story and Science of the Reading Brain

ISBN 0060933844

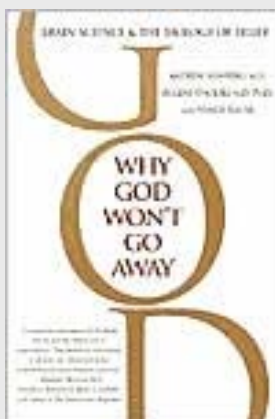
Curious? Wonder what is behind our fondness of reading? This one caught my attention...

**Expand your own reading list
& provide a review....**



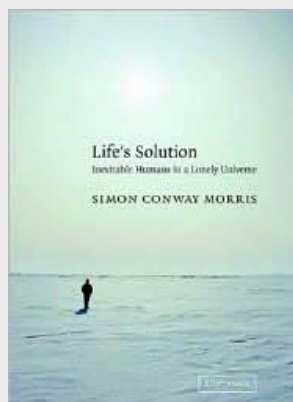
Don't forget last issue's suggestions of books for the 2009 (XXXI) Brown Symposium:

**Dr. Andrew
Newberg MD**



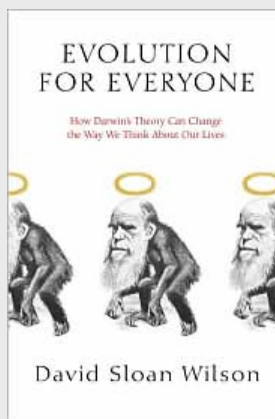
ISBN-13: 9780345440341

**Dr. Simon Conway
Morris PhD**

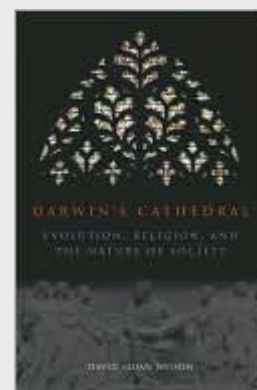


ISBN-13: 9780521827041

Dr. David Sloan Wilson, Ph.D.



ISBN-13: 9780385340212



ISBN-13: 9780226901350

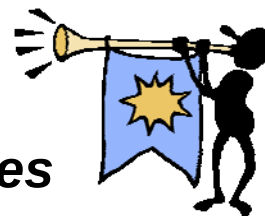
BIOSCOPE FOCUS:

Pedagogical & Scholarly Updates



- **Ms. Linda Southwick** taught Forensic Biology class for non-majors for the first time in May term. It was a big success. The students' fingerprints were used in the crime scenes. The students enjoyed this new course. Ms. Southwick will be presenting a poster about the new class at the NABT meeting in Memphis in October.
- **Dr. Romi Burks** spent a few days in Washington, D.C. for training as a **BEN (BioSciEdNet) Scholar**. As a scholar, Dr. Burks met with other faculty interested in student-centered learning to help promote digital libraries available to biology faculty. She will conduct a workshop to introduce other faculty to such resources.
- **Dr. Ben Pierce** spent part of the summer preparing for a new FYS Class called "A River Runs Through It" which looks at the influence of and history around the San Gabriel River.
- **Dr. Maria Cuevas** and **Kurt Seilheimer '07** saw their research collaboration come to fruition with a paper titled "In vitro cytotoxic activity of anthrapyrazole analogues in human prostate DU-145 and testicular NTERA-2 carcinoma cells." published in *Oncology Reports* (July 2008; 20(1):239-44).
- At the annual meeting of the Ecological Society of America in Milwaukee in August, **Dr. Max Taub** and **Dr. Romi Burks** gave presentations about working with undergraduates in research in a session about providing mentorship for future professors at predominately undergraduate institutions. Dr. Taub spoke of his experience with meta-analysis and Dr. Burks provided advice for working with students as authors of collaborative research.
- **Drs. Maria Todd, Rebecca Sheller and Maria Cuevas** began their collaborative project on functional analysis of claudin-3 tight junction protein over expression in breast epithelial cells this summer. A university grant from Mellon Funds for interdisciplinary research provided funding for the beginning stages of this exciting new collaborative project.
- **Matt Barnes '06**, an Honors student in the Biology Department, will finally see his thesis project appear in print in the September issue of the Journal of the North American Benthological Society. Co-authored with alumna **Rebecca Marfurt '05** (Environmental Studies) and Houston collaborator Jennifer Hand, this paper documents the first measurements of fecundity of the invasive applesnail, *Pomacea insularum*. Although chronologically this paper should have appeared first, it marks the completion of the first three projects completed on applesnails in the lab of **Dr. Romi Burks**.

BIOSCOPE FOCUS: MORE Pedagogical & Scholarly Updates



- **Dr. Andrew Woodward** presented a research project, "Natural variation in auxin responses among *Arabidopsis* accessions," at a meeting of The American Society of Plant Biologists in Mérida, México. While at the conference, **Dr. Woodward** also presented a pedagogical poster highlighting a program at Rice University that introduces first-year students to the process of biological research.
- Over this summer, **Dr. Maria Cuevas** conducted a set of experiments investigating the effect of 4 hydroxytamoxifen on endometrial tissue, supported by the Sam Taylor Fellowship. She is currently writing a manuscript for publication.
- **Ian Bothwell '08**, a former research student in both Biology and Chemistry, recently began his NIH fellowship working for Dr. Kenneth Yamada studying branch morphogenesis in the salivary glands of mice. His work focuses on extensive microarray analysis of developing embryonic salivary glands. His lab is in the cell and developmental biology division associated with the National Institute of Dental and Craniofacial Research.
- **Dr. Romi Burks** visited Georgia Tech University in Atlanta, GA, in August and gave a presentation titled "Following the slime trail: investigating ecological "foot"prints of exotic, invasive applesnails (*Pomacea insularum*). She hopes to collaborate with GT ecologist Dr. Mark Hay during sabbatical.
- In addition to teaching May Term at Southwestern, **Ms. Linda Southwick** also taught Anatomy and Physiology to predominantly Navajo and Zuni students in Gallup, New Mexico.
- During this Fall semester, you are likely to find **Dr. Maria Todd** writing as she prepares some research for publication as part of her Brown Junior Fellowship.

2008-09 Officers



President:
Vice-President:
Secretary:
Treasurer:
Volunteer Coordinator:
Pre-Med Chair:



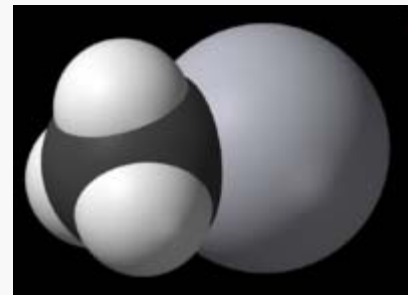
Shug Evans
Kerry Pattie
Taylor Jones
Valerie Sanchez
Fern Nguyen
Sarah Ferrero



Learn something new from BioScope Magnifications

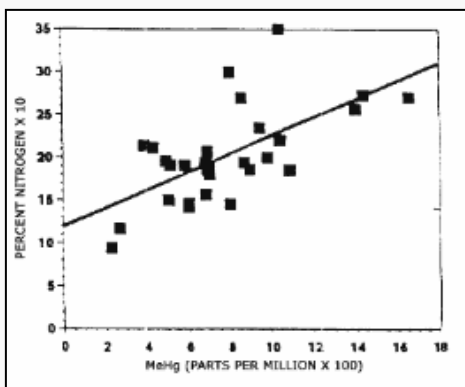
MOLECULE and PATHWAY: **Methylmercury & Biomagnification**

"Methylmercury" is a shorthand for monomethylmercury. It is composed of a methyl group (CH_3 -) bonded to a mercury atom, commonly written as CH_3Hg^+ or sometimes written as MeHg^+ .



<http://en.wikipedia.org/wiki/Methylmercury>

In aquatic systems, methylmercury can form and persist in organisms, eventually becoming biomagnified in aquatic food chains from bacteria through macroinvertebrates to piscivorous (fish-eating) fish and other vertebrates. At each step in the food chain, the concentration of methylmercury in the organism increases. The concentration of methylmercury in the top predators can reach a level a million times higher than the level in the water.

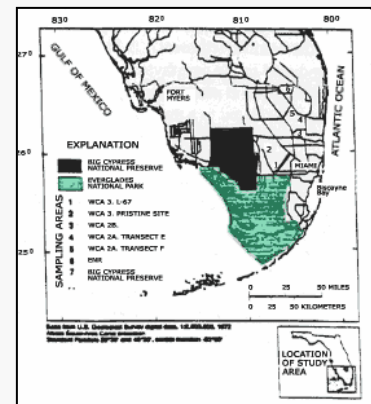


"ORGANISM": Periphyton –represents a combination of different algal species, bacteria, protists and fungus held together in a matrix. Abundant periphyton occurs in mats. Periphyton growth is responsible for the bulk of the primary production in the Everglades (Brock, 1970), and is home to, and food for, creatures that are the foundation of the food chain.

ECOSYSTEM: Everglades – as part of the South Florida Water Management District

<http://sofia.usgs.gov/publications/fs/184-96/>

Increased nutrient loading, especially nitrogen (see Graph) in this system has increased the prevalence of methyl mercury.



To learn more about mercury, come to the 1st Event of
the Biology Seminar Series – a talk by Dr. Matt Chumchal
– an SU ALUM!! Friday at noon in Room 148



**Just 2-3 weeks into the Fall ----
believe it or not, it will soon be time to
think about SPRING!
Advising will start before we know it!**

Here is a brief preview of the courses offered for Biology majors.

- ☐ 1st Year: *Genes and Molecules* – Woodward – MWF 10/11 plus lab
- ☐ 1st Year: *Genetics and Evolution* – Taub MWF 10/11 plus lab
- ☐ All labs with Ms. Southwick (match evens with evens; odds with odds)

- ☐ 2nd Year: *Methods in Cellular and Molecular Biology* – Todd
Tu/Th 8:45 – 10:45 a.m. (pre-reqs 1st year sequence)
- ☐ 2nd Year: *Methods in Ecology and Evolution* – Burks – Tu/Th
8:45 – 10:45 a.m. (pre-reqs Statistics + 1st year sequence)

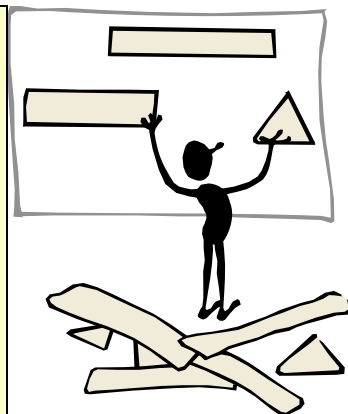
**These courses will require at least the 1st year sequence
& the appropriate Methods course. Times for the upper
level courses are still being determined by the
department but will soon appear on Web Advisor.**

- ☐ **Endocrinology (O): Cuevas**
☐ Note that this class requires completion of Organic II
- ☐ **Genetics – (P): Pierce**
- ☐ **Biochemistry (C/M): Dr. Foote/Bruns**
☐ Note that this class requires completion of Organic II

☐ **Ecology – (P): Burks**

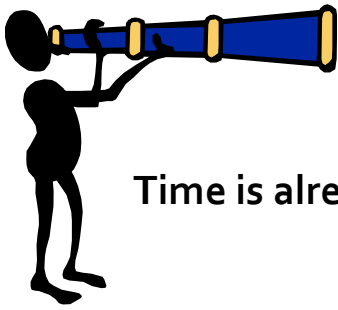
Capstones in Biology can be associated with any of ABOVE courses or completed through an independent research project or internship. Students should discuss their capstone plans with their advisors or a member of the Biology Department.

-
- ☐ **Microbiology (C/M): Woodward**
☐ Note that this class requires completion of Organic I
 - ☐ **Regenerative Bio & Medicine: Villa**
 - ☐ **Comparative Vertebrate Morphology (O): Wheeler**

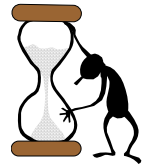


**4 hours of research also
equals an upper-level
course with a lab**

Students & Faculty
interested in submitting
announcements, items
for focus, profiles or
highlights (i.e.
Magnifications) to
BioScope should email
Dr. Burks. 8



Looking Ahead?



Time is already running out as the Brown Symposium XXXI gets closer and closer!

Dr. Ben Pierce, Professor of Biology and Brown Chair holder, will host the next Brown Symposium on science & religion.

The event will bring in noted speakers, include the greater community and culminate in a 2 day lecture series. Many things need to be done in preparation and at the event. This represents a great opportunity to get involved in a extracurricular academic endeavor. If you are interested in helping out, please contact Dr. Pierce (pierceb@southwestern.edu or x1974).



**Don't miss your
chance to engage, you never know when it might
be transformative!**



- **What is it?**
 - The AB Program includes a blend of biology and psychology which can lead to majors (BA or BS) or minors associated with the study of animals.
- **Who is it for?**
 - Students that want to connect their study of liberal arts to the world of animals, whether that means advocating for them, representing them in artistic ways, studying their behavior or helping promote their good health.
- **When does it start? (Intro course starts October 28th)**
 - Because many of the courses required include sequences, we encourage students to think about Animal Behavior early. If it later turns out that students want to pursue other disciplines, then it is easy to change. Coming into the program as a "seasoned student" is more difficult (but not impossible).
- **Where to people go with an AB degree?**
 - Anywhere....grad school, the Army to train dogs, high school teaching, vet school, Sea World ---wherever a student's skills, motivation and dedication take them.
- **How do I find out more?**
 - Contact Chairperson Dr. Romi Burks or Student Representative Jen Penland

Dr. Ben Pierce serves as coordinator for 2008-2009 series. Send him any suggestions for speakers that you might have. Seminars occur in FJSH 148.



THE DEPARTMENT OF BIOLOGY PROUDLY ANNOUNCES THE FALL 2008 SEMINAR SERIES

Friday, September 12, Noon

Matt Chumchal, Texas Christian University

- Mercury in the Food Web of Caddo Lake: An Unnatural Problem in Texas' Only Natural Lake

Thursday September 25, Noon

Bryan Brooks, Environmental Studies, Baylor University

- Ecotoxicology

Thursday, October 2, Noon

Tom Hedman, Matrix Modification Research Program, Texas A&M University and Orthopeutics, L.P.

- Extracellular Matrix Modification: An Emerging Treatment Option for the Spinal Disc

Thursday October 9, Noon

Melissa L. Mullins, Marsh Madness Program and Baylor University

- Restoration Ecology of the San Marcos River

Thursday, October 16, Noon

David Crews, University of Texas

- Sex Determination in Reptiles

Thursday, Oct. 23, Noon

Victoria P. Knutson, Graduate School of Biomedical Sciences at University of Texas, Houston

- Life as a Graduate Student--What's It All About?

Thursday, October 30, Noon

Dr. Andrea Gore, University of Texas School of Pharmacy

- Transgenerational, Epigenetic Effects of Environmental Endocrine Disruptors on Reproduction

Thursday, November 6, Noon

Janet Price, UT Health Sciences Center, Houston

- Tumor-Stroma Interactions in Breast Cancer Metastasis

Thursday, November 20, Noon

Nancy E. Street, UT Southwestern Medical Center at Dallas

- Role of Th1 and Th2 cells in Protection from *Cryptococcus neoformans* Infection AND Educational and Research Opportunities

REMEMBER: The Department invites students to lunch (for free!) with speakers after their seminar.

