



# BIOSPHERE

## The Weekly Bulletin of Biology

Biology Colloquium: Friday, 17 February 2012, 2:00 pm in CR 5125

### "Exploring the Heat-Shock Response of *Boechera*, a Highly Thermotolerant Native of California"

Elizabeth Waters, Ph.D.

San Diego State University

### Prospective Profs Interview

The Department is interviewing candidates for a tenure-track position in marine biology. The next job talk is Friday, 17 February at 11:00 am in Jerome Richfield Hall JR 246. Dr. Dawn Vaughn's title is, "Linking environmental uncertainty, individual performance and species interactions in the sea." Students are encouraged to attend and provide their feedback about the candidate.

### Gray Lab on a Roll

It seems every week we are announcing a new publication about crickets. This week, former Biology undergrad and grad student **Kelly Sakaguchi** and **Dr. David Gray** have a paper in *Animal Behaviour*, "Host song selection by an acoustically-orienting parasitoid fly exploiting a multi-species assemblage of cricket hosts." This work stems from Sakaguchi's master's thesis.

### Engaging Undergraduates in Research<sup>1</sup>

—Dr. Steve Oppenheimer

**Practical Motivation**—UC Santa Barbara's website: Medical school, Pharmacy, Veterinary, Podiatry, and Optometry, all say undergraduate research is highly recommended. Student Doctor Network: research becoming critical for professional school admissions. Utah State University, Center for Integrated Biosystems: undergraduate research is not only recommended, but required at many professional schools.

**Are there Enough Research Experiences to Serve All Interested Students?**—At many universities the answer is no. My recent receipt of a U.S. Presidential Award for mentoring research students, mostly undergraduates, was in large part because of my record in accommodating *all* interested students in

<sup>1</sup> Oppenheimer presented an invited address at the 24th Annual CSU Biotechnology Symposium. An excerpt of his address is printed here.

my research lab. I am able to do this because:

- I recruit many student research leaders to help supervise the new students.
- I provide research projects that use inexpensive supplies.
- I select experiments that involve simple procedures so all students can do the work.
- I'm in the lab supervising and checking student work daily. My office is my lab.
- Student schedules are such that no more than 10 students are usually engaged in research at any one time.
- The lab is open weekdays, nights, weekends, summers, and intersessions.
- The students receive course credit for research.
- The students do statistical and graphic analysis of their work.
- The student research gets published and nationally presented.
- I write over 500 recommendation letters per year, helping their admissions to advanced programs. The students know this and that attracts them to my lab.

**Results (not a controlled study)**—More than 700 student co-authors on presentations given at meetings and published papers. I've asked my past students to report back to me. Of 130 respondents:

- All are in science-associated careers or in advanced science programs.
- 23% completed the Ph.D. or are in Ph.D. programs.
- 53% are women or underrepresented minorities.

I also asked colleagues in my department, and collectively they reported 300 additional undergraduate research students who have entered science careers and advanced science programs.

**More Ideas to Engage Undergrads in Research**—(1) Students should apply for grants.

(2) Students should take research-oriented courses early in their academic careers.

(3) Community colleges should get involved in research.

(4) Universities should offer freshman seminars, such as is done at Harvard University.

(5) Freshman courses for scientists should be modified to address research and improve research skills, such as how to analyze data.

Research is perhaps the best real-world teaching tool of all.

## A Career in Teaching

Graduate student **Greg Avellis**, who you might know as a TA in Human Anatomy labs, has been hired to teach Introduction to Biology this semester at College of the Canyons. Here's wishing Greg the start of a happy and effective career in teaching.

Community college teaching generally is entered after completing a master's degree in the subject matter (or a Ph.D.). If you are interested in a career at a community college, consider our master's program as a path to your future.

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