

Bios

The Department of Biology Newsletter
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Editor: Paul Wilson

For back issues and more information about the Department: www.csun.edu/biology

Newest prof: Ernie Kwok

This fall, Dr. Ernest Kwok has joined the Biology department as an assistant professor. Kwok is teaching Cell Biology (BIOL 380) and a graduate seminar in cell biology (655). In the spring semester, he will teach Introductory Biology II (107) and Cell Biology again.



Kwok's roots are in the area: he graduated from Agoura High School. He attended Harvey Mudd College in Claremont, where he majored in Biology and was introduced to plant biology while doing a thesis project on root development. For graduate school, Kwok left California for Cornell University in upstate New York. There he completed a Ph.D. dissertation on the biology of stromules: narrow, membrane-bound projections of the chloroplast surface. Next, Kwok did postdoctoral research in a yeast biochemistry lab in Buffalo, New York. Now, he says, "I'm excited to be back at home in Los Angeles."

At CSUN, Kwok will be returning to his graduate research on plastid stromules.

Stromules (stroma-filled tubules) are dynamic extensions of the plastid membrane. While very thin, they can extend to several times the length of the plastid they project from. The fact that they are so narrow means it is difficult to observe them using standard light microscopes. This explains why they have received so little attention from the scientific community. Interest in stromules only picked up recently when the ability to express fluorescent proteins in the plastid stroma illuminated these structures. The frequency and length of stromules appears to vary according to cell type, and their movement is controlled in part by the cytoskeleton. But as yet, no one has been able to assign them a function. Kwok is looking for the answer.

Research projects in the Kwok lab will center on synchronizing plant cell lines to understand the relationship between stromule formation, plastid division, and the cell cycle. Students can learn about many topics including fluorescence and confocal microscopy, tissue culture, plant transformation, genetics, molecular biology, and protein analysis. Other projects in the lab will involve investigating novel intracellular structures identified by fusions between random protein and green fluorescent protein.

Kwok says, "I'm looking for some hard-working students with active imaginations who are ready to start asking questions on their own. Students with green thumbs are especially encouraged to visit." 🌱

Puzzling over observations on organisms in Ecuador

—Christina McNeal*

I wish I could say that my experience in Ecuador during the Tropical Biology Semester answered all my questions regarding tropical ecology and conservation. But that just isn't the truth. Instead of answering my questions, it created greater curiosity. The professors said this is expected in science, and they noted how we were becoming more

* McNeal was an Environmental Biology undergrad, and is now an M.S. student working with Dr. Paula Schiffman.

sophisticated as scientists, fitting observations together and then asking more questions.

From my point of view, it seemed that there were many instances where it was more like my inner child took hold, like at 2:00 am when I had a frog in one hand and a katydid in the other asking, "How much fitness gain would these crazy animals have to accrue for singing all night to be favored by selection?"

When I heard of the Tropical Biology Semester, I was so excited to get a hands-on approach to "real science." The class was held at CSUN for the first month of the semester, then spent the next six weeks in Ecuador, and the last month back on campus when we tried to figure out what all our data meant.

The time in Ecuador was spent at four biological stations. Each student did two unique projects on ecology and vertebrate biology. Each student started many more projects than he or she could complete and asked many more questions than he or she could answer.

Our bus ride to our first destination, Bellavista Cloud Forest Reserve, took my breath away with waterfalls cascading off of green mountain sides. Bellavista is a wet place. Our stay was filled with steep slippery mountain hikes on which it was pointless to try to do other than wallow through the mud. If CSUN is the squirrel motel, then Bellavista is a bed and breakfast for birds. We saw rare hummingbirds, toucans, quetzals, and a large variety of tanagers, just to name a few.

Bellavista is where I and 13 other students started our scientific investigations. Choosing only one project was the most difficult part. The class would have a symposium once a week to discuss our individual projects as well as scientific journal articles. I developed a project that would allow me to compare forest types at each location we were visiting. Many questions flooded my mind. With all the avian species richness, I came to ask, "How much does one bird's niche overlap with the next? And, how does this influence competition?" Developing a project that is feasible was more of a chore than I thought it would be.

The second destination was Mindo Gardens, where the constant river roar and mosquito whine wore away at the auditory lobes of the brain. Shipping our

equipment and bodies over the river in a gondola was *quite* the experience. It wouldn't have been at all hard to drop a headlamp or other crucial gear into oblivion.

At the third destination, Maquipucuna Reserve, we were greeted by an Oncilla, *Leopardus tigrinus* – so, okay, it was road kill, but road kill in good shape. Carnivores are hard to spot when they are still breathing. Maquipucuna Reserve is surrounded by 35,000 acres of forest. We had access to roam and explore as we pleased. Kinkajous scaling banana trees at night, Fer-de-Lance snakes coiled on the trails, and Spiny Tree Rats caught in traps were a few of the many highlights.



Spiny Tree Rat

Over the mountains and through the woods, we started our 12-hour bus ride, 3-hour boat ride, another bus ride, and one more boat ride to the secluded pristine research center of Tiputini Biodiversity Station. The travel was worth it! The pristine primary forest was rich in species, and around every corner stood new excitement. The first morning came squawks of Scarlet Macaws, howls from the Howler Monkeys, and debris falling on our cabin from a passing family of Spider Monkeys. After the first day, my mind was full of ideas for a new project, “What is the life history strategy of Tent-Making Bats and the reproductive advantage of the Hoatzin’s pendulum nest.” I knew with only two weeks before we headed home a new project might be better matched for a magician than a scientist. But like many in the class, I would give it my best effort under a deadline. Both the flora and fauna at Tiputini were mind-boggling.

The director of Tiputini gave lectures on conservation issues surrounding Amazonian tropical forest, the large mammal trip cameras in place at Tiputini,

and the biodiversity of the station. Even though no one on our trip spotted a jaguar, we know they roam the station because the trip cameras don't lie.

The Tropical Biology Semester clarified my career goals. By the end, I knew that a master's program in field biology was to be my next step. One of the most amazing parts of the Ecuador trip was how it made me start becoming a naturalist. There is something notable in the act of pure observations. Observations may create more questions than answers, but now I know that is part of “real” science.☛

Plan for Catalina Fall 2010

The Catalina Semester is scheduled for fall 2010. It will consist of three classes, Invertebrate Zoology, Marine Phycology, and Ecology of Marine Fishes, plus an independent studies project. Students live and study at the biological station on Santa Catalina Island. If you're interested in spending the whole of next fall out on the Island, contact Dr. Mark Steele <mark.steele@csun.edu>.☛

Science Tutoring Center

This year we have a tutoring center. Some of the nicest and smartest of all the grad students are in Live Oak 1227 to help you disentangle the curriculum, 1-on-1 help, the opposite of intimidating. Topics cover all the 100-level Biology, Chemistry, and Physics courses, as well as Anatomy and Physiology. Hours of particular specialists are posted on the door. And it's free (well, sort of – you already paid for it in your Campus Quality Fee). Please make good use of this learning resource.☛

Microbiology Students Assoc.

The Microbiology Students Association <csun.msa.googlepages.com> at California State University, Northridge, is an accredited student chapter of the American Society of Microbiology. MSA, established in 1984, is the oldest continuously active student chapter in SCASM and currently has over 50 members. MSA offers all students

interested in microbiology a chance to engage in activities to expand their knowledge of the microbial world.

One goal of MSA is to promote research and professional development among members. The most important events include attending and presenting research at the SCASM student colloquium and at the national ASM meeting.

MSA has a full schedule of additional activities, both educational and recreational. MSA organizes meetings at which invited speakers discuss their current research, the role of microbes in medicine, and a wide variety of related microbiology topics. Members also enjoy lunch meetings and our traditional bowling tournament. MSA is currently planning trips to points of interest including the Simi Valley Water Quality Control Plant, Kaiser Permanente North Hollywood Microbiology Laboratory, and San Antonio Winery. The annual sale of microbiology-themed custom T-shirts continues to help support MSA.☛

Awards

The White House has honored **Dr. Steve Oppenheimer** with a Presidential Award for Excellence in Science, Mathematics, and Engineering Mentoring. This is national recognition for his relentless involvement of large numbers of students in research, often including students from demographics that don't often realize the opportunity to become scientists.

Dr. Peter Edmunds was honored as the 2009 recipient of the Bianchi Research Award of the College of Science and Math. Edmunds has authored a large number of papers on corals.

The College honored **Dr. Cindy Malone** with its 2009 teaching award. Malone's excellence in teaching spans courses from the general education BIOL 100 Introductory Biology through 360 Genetics to 500-level courses.

Biology students won many of the College's 2009 awards:

- the Bianchi Outstanding Graduate Student was won by **Haïke Ghazarian**,
- the College Hugo and Irma Oppenheimer Award by **Adorina Moshava**,

- the Heald Outstanding Graduating Senior Award by **Anthony Daulo**,
- the College of Science and Mathematics Outstanding Junior Award by **Sofia Radillo**, and
- the Bianchi Outstanding Undergraduate Award was won by **Alexandra Forest**.

The Biology Department issued several awards:

- the Outstanding Senior Award went to **Jessica Phillips**,
- the Bennett-Bickford Award for promising teaching went to **Nikita Tripuraneni**,
- the Biology department Hugo and Irma Oppenheimer Award to **Jeremiah Bautista**,
- the Leslie Family Scholarship to **Sheryl Recinos**,
- the Outstanding Graduate Student Award to **Christina Vasquez**,
- the Outstanding Graduate Research Award to **Yasuko Hirakawa**, and
- the Outstanding Graduate Teaching Award went to **Carri Musser**.[☛]

Conferences Attended

Dr. Janet Kübler was an invited speaker at the Biomimicry Swarm. The meeting is an international gathering of professionals in business, design, engineering, government and education. She also participated in the Biomimicry Education Summit over the summer.

Dr. Michael Summers' graduate students **Jenevieve Polin** and **Valentina Korchagina**, along with former undergraduate **Karen LeGrand** presented posters at the American Society for Microbiology general meeting. Summers also gave an oral presentation in Montreal at the International Symposium for Photosynthetic Prokaryotes.

The annual Benthic Ecology meeting was held in Texas last spring. **Dr. Robert Carpenter** attended the meeting with his graduate students **Melissa Spitler**, **Stella Swanson**, and **Maggie Johnson**. Spitler presented a talk, "Factors influencing the distribution and abundance of dominant macroalgae in Moorea." Swanson and Johnson presented posters, "Species-specific effects of echinoids on coral reef community structure" and "The effects of elevated pCO₂ on the physiology of the crustose coralline alga *Hydrolithon onkodes*." Representing the Edmunds lab

were graduate students **William Goldenheim**, who spoke on "The effects of flow and temperature and the growth and photophysiology of massive *Porites* in Moorea," and **Nicholas Colvard**, who spoke on "Decadal-scale changes in the abundance of benthic reef invertebrates on the south coast of St. John, US Virgin Islands."

At the meeting of the American Society of Ichthyologists and Herpetologists, CSUN had four representatives presenting papers and one presenting a poster. **Dr. Mark Steele** presented work that he has been doing with graduate student **Dave Wang** entitled, "A test for equivalence of reproduction of temperate reef fishes on artificial versus natural reefs." **Dr. Clare Wormald** presented a paper on work that she has done in the Bahamas entitled, "Positive effects of group living on recruitment and survival of a harvested coral reef fish." Graduate student **Jenna Krug** gave a talk on "A test for correlated recruitment of predator and prey species of kelp forest fishes." Graduate student **Natalie Martinez-Takeshita** presented a poster on "The global genetic diversity of the Yellowtail." Representing the herpetologists, undergraduate **Navasha Singh** presented a paper on the work that she has done in Dr. Espinoza's lab, "Going green takes guts: comparative gross morphology of lizard digestive tracts as a function of diet." The meeting was attended by several other CSUN graduate students and professors as well.

Jeremiah Bautista, an undergraduate student in Dr. Cheryl Hogue's lab, presented a paper at the International Conference of the Wildlife Disease Association: "Possible bioindicators of pollution exposure in *Paralabrax nebulifer* from Long Beach Harbor."

The Dudgeon lab attended this year's Evolution Society meeting. **Christina Vasquez** presented a talk, "Morphological plasticity in the face of multiple stressors." **Carly Ryan** presented a talk, "Intra-specific competition as an agent of morphological selection." **Dr. Steven Dudgeon** rounded out the hydroid trifecta with a talk, "Characterizing colony form in *Hydractinia symbiolongicarpus*."

Jessica Diaz of the Zavala lab, presented her research at the 19th International *Arabidopsis* meeting, and at the annual meeting of the American

Society of Plant Biologists. **Raghad Alrabadi** and **Leticia "Ruby" Carrillo** also presented at the ASPB meeting. Carrillo's trip was sponsored by the American Society of Microbiology.

Members of the Murray lab attended the Caulobacter Meeting and the ASM Prokaryotic Development Meeting. Undergrad **Alexandra Forest** spoke to the students of Caulobacter, "Use of *Caulobacter crescentus* as a whole-cell biocatalyst for the hydrolysis of esters useful in synthetic chemistry." At the same meeting, grad students **Adorina** and **Arbella Moshava** gave a talk, "The P1 promoter of the *Caulobacter crescentus* cell cycle master regulator CtrA is necessary for normal growth and development." Undergrad **Anthony Daulo** presented a poster at both meetings, "Integrating temporally regulated cyclopropane synthases with bacterial cell cycle progression." At the Prokaryotic Development meeting, **Dr. Sean Murray** gave a poster, "The P1 promoter of the *Caulobacter crescentus* cell cycle master regulator CtrA is necessary for normal growth and development."

Many of the above students won travel scholarships from the societies in whose meetings they participated. Additional support in many cases was provided by the Associated Students, the College of Science and Mathematics, and the Biology Department. In some cases, none of the trip was paid for out of pocket.[☛]

Meet the Job Candidates

In November there will be a string of job candidates for three open positions: Microbiologist, Evolutionary Biologist, Molecular Geneticist. Each candidate will give a talk about her or his research. Students are encouraged to attend. Keep an eye out for announcements.[☛]

New Publications

There are four new publications from the Steele lab. J. F. Samhuri, R. R. Vance, G. E. Forrester, and **Mark Steele** have a paper in *Oecologia*, "Musical chairs: density-dependent mortality caused by competition for unguarded refuges." Samhuri, **Steele**, and G. E.

Forrester have a paper in *Ecology*, “Intercohort competition drives selective mortality and shelter-mediated density dependence in a coral reef fish.” A. C. Stier, **Steele**, and A. J. Brooks have a paper in *Coral Reefs*, “Coral reef fishes use the crown-of-thorns seastar as habitat.” Finally, a number of authors including our Drs. **Mark Steele** and **Clare Wormald** have a paper in *Current Biology*, “Recent region-wide declines in Caribbean reef fish abundance.”

Dr. Paul Wilson and former grad student **Betsy Jordan** have a paper in *Botany*, “Hybrid intermediacy between pollination syndromes in *Penstemon*, and the role of nectar in affecting hummingbird visitation.” Former grad student **Sarah Kimball** and Wilson have an id guide in *Bulletin of the American Penstemon Society*, “The insects that visit penstemon flowers.” Finally, Wilson has a commentary in *New Phytologist*, “Striking example of avatars evolving together among local communities.”

Steve Oppenheimer, **Haik Ghazarian**, **William Dalrymple**, **Ziba Razinia**, **Ed Carroll**, **Stan Metzenberg**, **Virginia Hutchins-Carroll**, and **Cathy Coyle-Thompson** have a paper in *Zygote*, “Exogenous hyalin and sea urchin gastrulation, Part IV: A direct adhesion assay – progress in identifying hyalin’s active sites.” In an edited volume, **Justin Dreyfuss** and Dr. Oppenheimer have a chapter entitled, “Cyclodextrins and cellular interactions.” The chapter reviews studies using cyclodextrin in cell membrane cholesterol efflux, cellular adhesion, membrane proteins and receptors, viral infections, bacterial infections, organelles and intracellular transport, lectins, immune system, nervous system, endocrine system, fertilization and embryogenesis, cardiovascular, and muscle.

Graham Ferrier and **Dr. Robert Carpenter** have a paper in *Biological Bulletin*, “Subtidal benthic heterogeneity: Impacts on the flow environment, and marine algal community structure and morphology.”

There are several papers this year from **Dr. Peter Edmunds**, students and colleagues. “Dynamic energy budgets in syntrophic symbiotic relationships between heterotrophic hosts and photoautotrophic symbionts” appeared in *Journal of Theoretical Biology*.

“Recurrent disturbances, recovery trajectories, and resilience of coral assemblages on a South Central Pacific reef” is in *Coral Reefs*. Mehdi Adjeroud, **Nancy Muehlehner**, and Edmunds wrote “Effects of ocean acidification and increased temperature on skeletal growth of two scleractinian corals” for *Proceedings 11th International Coral Reef Symposium*. Also for that journal, Adjeroud, **Holly Putnam**, and Edmunds wrote “Responses of coral hosts and their algal symbionts to thermal heterogeneity.” **Geoffrey Horst** and Edmunds wrote “Spatio-temporal variation in seawater characteristics in a semi-enclosed bay in St. John, U.S. Virgin Islands” for *Caribbean Journal of Science*. And Edmunds has a solo-authored paper in *Marine Biology*, “The effect of exposure to low temperature and reduced light on the response of reef corals to elevated temperature.”

Chris Chabot and **Dr. Larry Allen** are authors of a paper in *Molecular Ecology*, “Global population structure of the Tope inferred by mitochondrial control region sequence data.”

Dr. Robert Espinoza has three entries on various species in *Lizards of the American Southwest: A Photographic Fieldguide*.

Dr. Dave Gray and colleagues have a publication in *International Journal of Comparative Psychology*, “The judder of the cricket: The invariance underlying the variance in behavior.”

Dr. Mike Summers, former grad students **Jennifer Hedger**, **Kimberly Leigh**, **Kumuda Saraff** and **Christina Pomykal**, along with Lab Technician **Peter Holmquist** have a paper in *Microbiology*, “Illumination stimulated cAMP receptor protein-dependent transcriptional activation from regulatory regions containing class I and class II promoter elements in *Synechocystis* sp. PCC6803.”

“Experimental confirmation of multiple community states in a marine ecosystem” has appeared in *Oecologia*, authored by P. Petraitis, E. Methratta, E. Rhile, N. Vidargas, and our own **Dr. Steve Dudgeon**.[Ⓜ]

In the Community

Grad student **Jen Paur** presented her research of the phonotactic behavior of the fly *Ormia ochracea* to the Lorquin Entomological Society at the Natural History Museum.

In the spring, CSUN hosted HerpFest, a gathering of professional herpetologists and amateur amphibian and reptile enthusiasts from around southern California. Approximately 40 people attended the event, which included a tour of the Biology Vivarium’s herpetology rooms, and the preserved Herpetology Collection.

Dr. Paul Wilson organized the 14th annual moss foray for Western bryologists. The group consists of academics, managers of public lands, environmental consultants, and crazed moss-o-holic amateurs. Field sites were studied between Fresno and Yosemite. One moss found was the 3rd record of the species in North America. The smallest bodied of California mosses, *Ephemerum serratum*, was also found and admired by all.[Ⓜ]

Fewer Holds on Registration

Usually, we put a hold on all undergrad Biology majors in the fall forcing students to get academic advising. Because of the budget crisis, we can’t handle so much advising this year, but please be responsible and seek advising if you need it.

The Biology Advising Center is still open, Eucalyptus Hall 2133 until we move to Chaparral Hall. Be sure to file for graduation well in advance. Be sure to take the Upper Division Writing Proficiency Exam as soon as you can.

Read the catalog, keep on top of things, and make progress on your degree program.[Ⓜ]

Speaking Elsewhere

Dr. Sean Murray gave a presentation to the Biological Sciences department at CSU Dominguez Hills on April 9th on “Suppressors of growth defects in tumor-targeting *Salmonella*”

In October, **Dr. Polly Schiffman** will discuss “The role of animals and disturbance in plant invasion: Lessons from the Carrizo Plain” as an invited

speaker at the annual symposium of the California Invasive Plant Council. 🌱

Spring Course Offerings

Topical Semester

Drs. Fritz Hertel and Tim Karels will take a group of students to Ecuador this spring for six weeks. The students will take a package of linked classes on tropical vertebrates and ecology.

Mosses, Ferns: Spring Break, Saturdays

There is a 6-day field trip planned for BIOL 409/L/492J Nonflowering Plants. The trip will include visits to the foothills of the Sierra and the coast redwood forest. The rest of the class will be taught on Saturdays only. On a few Saturdays the class won't meet at all to save time for the 6-day trip, which will be during the first half of spring break.

Biological Imaging

We once had a class on electron microscopy. The field has expanded a bit with new fancy microscopes, and the course has a new name, Biological Imaging. BIOL 575 will be taught Monday and Wednesday afternoons by Dr. Cathy Coyle-Thompson.

Graduate Seminars

On Mondays, Dr. Steve Dudgeon will have a seminar in physiology on clonal eukaryotic organisms including aspects of their development, physiology, morphology, ecology and evolution (BIOL 655E). Also on Mondays will be a seminar in microbiology led by Dr. Larry Baresi, "Abiologic to biologic." The seminar will discuss the possible events leading to life (655A). On Thursday nights, Dr. Polly Schiffman will lead a seminar (615C) on, "The evolution of ecological understanding." The course will address how/why the thinking and approaches to ecological questions and research have changed over time. The relevance of connections between historical ecology/ecologists and current research at CSUN will also be considered. On Fridays 11:00-1:45, Dr. Cindy Malone will have a seminar on the genetics and epigenetics of cancer (655D). 🌱

Taiwan

Nicholas Colvard, a graduate student in the Edmunds lab, was the recipient of the prestigious NSF East Asia and Pacific Summer Institutes (EAPSI) award for graduate students pursuing science. Colvard traveled to Pingtung County in Taiwan for two months to conduct research at the National Museum of Marine Biology and Aquarium (NMMBA). Colvard's research is investigating the photophysiological and growth response of scleractinian coral to their light microenvironment. While in Taiwan, he also attended an international workshop, "Responses of coral holobionts under the impact of climate change: Symbiont diversity, coral bleaching, diseases, and ocean acidification."

Maggie Johnson, of the Carpenter lab, traveled to NMMBA to conduct research studying the effects of grazing by different species of urchin on crustose coralline algal photosynthesis. Johnson's research was supported from the remainder of an NSF program development award.

One measure of the success of this funding is the potential to visit Taiwan again in the future, further building the international collaboration. The project has so far been a huge success, as a three-year project with Taiwan is now getting off the ground. Through the fall and into 2010, Dr. Edmunds and his team will be recruiting a new postdoctoral researcher to work in Taiwan for as many as four months each year. Along with a team of graduate and undergraduate students, the Edmunds lab will continue Taiwanese collaboration in order to study the effects of climate change on coral larvae. 🌱

Moorea

Students in the marine biology area continue to go to Moorea during every break to do research connected with the NSF's Long Term Ecological Research Program on coral reefs there.

William Goldenheim, Daniel Green, Nicholas Colvard, and Caitlin Cameron spent six weeks in Moorea conducting research with **Dr. Peter Edmunds**. The research focus of the 2009 field season was the physiological response of juvenile corals to ocean acidification. Goldenheim's project

focused on the photophysiological response of *Porites* coral to differing flow and temperature effects. Colvard did research addressing the photophysiological response of coral to their light environment, and Cameron's research addressed the physiological response of scleractinian corals to corallivory. Green worked as a project technician on the response of juvenile corals to ocean acidification. Undergrad **Darren Brown** accompanied the Edmunds lab for one week, along with collaborator and elementary school teacher Craig Didden.

Dr. Robert Carpenter, with graduate students **Stella Swanson** and **Maggie Johnson**, traveled to Moorea during the summer to do research on investigating the algal assemblages of the Moorean reefs. Swanson's field research was on the impact of different species of sea urchins on coral reef community structure, and Johnson's work is addressing the effects of ocean acidification on the physiology of the crustose coralline alga *Hydrolithon onkodes*. **Anya Brown**, a new graduate student to the Carpenter lab, joined for the second half of the summer to provide research assistance. Carpenter didn't come right back; he stopped over in Hawaii to continue his research there. 🌱

Summer in the Virgin Islands

—Cynthia Ross

Last fall when Dr. Edmunds announced in his Invertebrate Zoology class that there are research opportunities for motivated students, I jumped at the chance. I began by doing an independent research project on the effects of ocean acidification on *Anthopleura elegantissima*, a common southern California anemone.

Then over four weeks this summer I had the opportunity to assist Dr. Edmunds in long-term monitoring of the coral reefs of St. John. While there, I also did surveys of my own to determine the density of juvenile *Montastraea annularis*, which is a major reef-building coral that has suffered severe decline in the past thirty years and has historically shown very low recruitment.

I worked hard in St. John. It was an amazing experience. I spent a month on a

beautiful island with great people, saw an amazing variety of marine life, and became the envy of friends and family. More seriously, I gained a greater understanding of the relevance of my studies, and that is fueling my desire for a career in marine research. I also feel better equipped to deal with the challenges of designing a research project.

This incredible opportunity was funded by NSF in the form of a Research Experience for Undergraduates supplement. Such supplements are added to research grants, allowing undergrads to come into first-hand contact with research. I feel that such opportunities, coupled with the support and guidance of professors such as Dr. Edmunds, would immensely benefit any student. ♣

K-12 Outreach, Training

As part of CSUN's Educational Talent Search Program, approximately 150 San Fernando Valley 6-12th graders visited on February 25th for "Math and Science Day." **Dr. Robert Espinoza** gave the keynote address, "Paving the path to your career in science, technology, engineering, and mathematics." The students also visited our biological collections with **Dr. Jim Hogue** and the botanic garden with **Brenda Kanno** and **Phillippe Lee-Gabriel**.

Dr. Steve Oppenheimer directed the K-12 Student Research Poster Symposium. Students and teachers from around Los Angeles presented in the Oviatt Library.

Volume 13 of *New Journal of Student Research Abstracts* was edited by Oppenheimer. The journal records summaries of K-12 science projects that were successful or otherwise interesting. Free copies of the journal can be obtained by phoning 818-909-3529 (Van Nuys Airport Public and Community Relations, the journal's sponsor).

Dr. Gini Vandergon taught a week-long institute at California State University, Dominguez Hills for LAUSD high school biology teachers. The goal of the week was to introduce the teachers to Agile Mind, which is an online resource for biology high school students. A unit lesson was modeled for the teachers using Agile Mind, and then the teachers rewrote a unit of their choice integrating Agile

Mind. The biology portion of Agile Mind was adopted by many schools in LAUSD last year and students who were exposed to Agile Mind in their biology course showed marked improvement on the district's periodic assessment.

Vandergon also was part of a team of teachers and professors at CSUDH that designed and implemented a two-week institute focusing on science and math teacher leadership and how to do action research in a high school setting. The program is part of "Masters in Science/Math Leadership" at CSUDH.

Workshops were taught last summer to prepare people for the California Subject Examination for Teachers (CSET). The workshops were targeted at students who want a single subject credential in science. They were taught by Drs. Norm Herr (Secondary education), Dorothy Ngyuen-Graff (Chemistry), Gerry Simila (Geology) and Gini Vandergon (Biology). Keep a look out for the next set of workshops this fall. Flyers will be posted.

We are proud to announce four new science Noyce scholars: **Kyra Grywacz** (Biology and Chemistry double major), **Robin Sehler** (Geology), **Ashley Winkler** (Biology), and **Collette Wixom** (Biology). This is a program for students who want to get a single subject teaching credential and teach middle or high school. They are joining four math Noyce scholars. The Noyce program is sponsored by NSF. Dr. Gini Vandergon and Dr. Gerry Simila run the science arm of Noyce on the CSUN campus. The next call for scholars will be at the end of the semester, you can find out more about the program by visiting www.csun.edu/math/noyce. ♣

San Fernando Valley Science Project and the Teacher Retention Initiative Program

Once again 4th and 5th grade teachers participated in a week-long professional development institute centering on methods of teaching science. They learned how to integrate good science instruction using FOSS, science inquiry kits that have been adopted by LAUSD for use in the K-5 classroom. The week also included a field trip to the Santa

Monica Mountains providing resources for the teachers who want to take their students on local field trips.

The following week 6, 7 and 8th grade teachers from local middle schools gathered together as professional learning communities in science. They worked together as grade-level teams on their science curriculum. Much of the work focused on how to teach science better and how to reach all learners in diverse middle school classrooms. They also had a culminating field trip in the Santa Monica Mountains.

Both weeks were very successful involving teams of professors from both the College of Education and the College of Science and Mathematics: Vincent Devlahovich (Geology), Michael Franklin (Biology), Brian Foley (Secondary education), Norm Herr (Secondary education), David Kretschmer (Elementary Education), Dorothy Ngyuen-Graff (Chemistry), Gerry Simila (Geology), Jeff Thomas (Biology), and Gini Vandergon (Biology).

Follow-up Saturday workshops are planned for this Fall. For more information, www.csun.edu/science/csp. ♣

Student Research Symposia

Biology students put on a good show at the 13th annual CSUN student research and creative works symposium. Those who won awards for an oral presentation were:

- 1st place in session 6: **Joshua Shipp**, "Mammalian perception of danger and safety in bird alarm and song calls, using the California ground squirrel"
- 1st in session 7: **Alexandra Forest** "Study of bacteria as biocatalysts for the hydrolysis of p-Nitrophenyl Picolinate"
- 1st place in session 8: **Melissa Spitler**, "Factors influencing the distribution and abundance of the dominant macroalgal species on coral reefs in Moorea"
- 2nd place in session 6: **Carly Ryan**, "The importance of intra-specific competition in driving morphological selection in *Hydractinia symbiolongicarpus*"
- 2nd place in session 8: **Danny Green**, "Effects of substratum on the ecophysiological success of juvenile corals in St. John, US Virgin Islands."

Biology students who won a prize for a poster were:

- 1st place campus-wide: **Sam Amirshahi**, “A yeast-two hybrid approach to determine if *Legionella pneumophila* effector proteins alter host cell vesicle formation”
- 3rd place campus-wide: **Jessica Beach**, “Regulation of GC-evokevoked leukemic CEM cell apoptosis by *C. elegans ces2* ortholog E4BP4.”

Every year a few of the better students from the CSUN symposium go on to a system-wide Student Research Competition. At that competition last spring **Joshua Shipp** won 2nd place in the Biological and Agricultural Sciences Graduate Student Division. And **Alexandra Forest** won 1st place in the Physical and Mathematical Sciences, Undergraduate Student Division.

In April, a symposium was held in which talks were given by the 2007-08 recipients of College of Science and Math Graduate Fellowships. The biology students who spoke were **Jessica Beach**, **Christopher Bowman-Prideaux**, and **Abigail Poray**.

In May, Sigma Xi sponsored a student research symposium. Biology undergraduates who presented were **Toni Uhendorf** “Does aerobic exercise ameliorate neurodegeneration?” (2nd place undergrad), **Lauren Ollison** “The role of neurotrophins in Schwann cell precursor migration,” **Navasha Singh** “Comparative gross morphology of lizard digestive tracts as a function of diet” (1st place undergrad), and **Leticia Ruby Carrillo** “A conserved palindromic sequence involved in akinete gene expression.” Biology master’s students who presented were **Jenevieve Polin** “Deletional mutagenesis of putative akinete-associated genes,” **Ani Julfayan** “Evidence for cell wall recycling in cyanobacteria,” **Wilber Escorcía** “The role of four response regulators in akinete differentiation” (1st place graduate), **Wyndee Haley** “Hummingbird choices at artificial flowers made to resemble bird-versus bee-pollinated flowers” (2nd place graduate), **Yasuko Hirakawa** “An efficiency-independent method of quantitative polymerase chain reaction,” and **Ekaterina Kovacheva** “Anthocyanidin synthase gene evolution in Hawaiian silverswords and California tarweeds.”

Pre-Health Report

— Terri Richardson, M.D.

I’m very pleased to report that last year’s group of pre-health students did very well at getting into professional schools.

Twenty-eight applied to medical school. Sixteen were undergrads, and nine of them are entering medical schools this fall. Twelve were post-bacs, and nine of them are entering medical schools. (As a point of reference, the national average of students who applied and then matriculated to medical school last year was 43%.)

The medical schools that our students are now attending include USC, UCLA, UCSD, St Louis University, Virginia Commonwealth University, University of Buffalo, Western University, St Georges, Ross, and American University of the Caribbean.

Thirty-four students who received advisement in our office applied to dental school last year. Thirty of them were undergrads, nine of whom have matriculated to dental schools. Four were post-bacs, all of whom have been accepted to dental schools. (The national average of students who applied that matriculated to dental school last year was 37%.)

The dental schools our students are now attending include USC, UCLA, Tufts, University of the Pacific, University of Medicine and Dentistry of New Jersey, and Western University.

One student has been accepted to optometry school, and two students have matriculated to podiatry school.

Thanks to all of the faculty who supported these great students and helped them realize their dreams. ♡

Pile it on Higher and Deeper

Undergrads advancing on to Ph.D. programs from the MARC programs were **Jessica Diaz**, who is going to UC Riverside, **Anthony Daulo**, who is going to UC San Diego, and **Mia Wibowo**, who is going to Cedars-Sinai. All of these students were awarded five-year fellowships to support their studies, and Diaz was awarded a highly competitive Integrative Graduate Education and Research Traineeship Program from the NSF. Others entering Ph.D. programs

include **Travis Morford** starting at UCLA in Chemistry and Biochemistry, **Haïke Ghazarian** starting at City of Hope, and **Christina Vasquez** starting at the University of Florida.

Last Summer, Next Summer

Undergrads who are serious about a career in research ought to make every effort to spend a summer doing some. Although we have no way of keeping an exhaustive list, quite a number of our students spent last summer as interns doing research at various institutions. These included: **Navasha Singh** (U Wisconsin), **Sokuntheavy So** (UCLA), **Juan Sosa** (Cal Tech), **Roberto Corona** (UCLA), **Lee Tillman** (Rutgers U), and **Lauren Ollison** (Purdue University). The notices for summer programs arrive from late November to mid-January and the applications are due often before March 15. Most require a statement of purpose/future goals, an academic résumé, and letters of recommendation. These summer programs offer a stipend and provide room, board and travel to and from the site. They offer students means of becoming fully involved in a research project for 6-10 weeks. Students are welcome to check out summer program information in EH 2128. ♡

Alumna News

Annette A. Angus, a former MARC and MBRS student has been awarded a University of California Presidential Postdoctoral Fellowship. Annette previously worked with Dr. Aïda Metzenberg for three years and with Dr. Michael Summers for one summer. The scholarship is a national competition designed to encourage outstanding women and minority Ph.D. recipients to establish research careers in academia in California and become our next generation of UC professors. ♡

Grants

For 2009/10 the College of Science and Mathematics gave out four *Graduate Fellowships for Outstanding Research Promise in Science and Mathematics*. Two went to Biology students: **Jennifer Granneman** and **Maggie Johnson**.

Eight Biology faculty won minigrants from CSUN's Research and Sponsored Projects competition: Drs. **Robert Carpenter, Randy Cohen, Robert Espinoza, Dave Gray, Fritz Hertel, Tim Karels, Aida Metzenberg, and Stan Metzenberg.**

Judge Julian Beck grants for improving CSUN classes were awarded to Drs. **Mary-Pat Stein and Tim Karels.**

Dr. Robert Espinoza and colleagues at Villanova University, Virginia Tech, and U. Idaho received a 3-year \$650K NSF grant to study the systematics and evolutionary and physiological ecology of geckos of the world. His research on gecko thermal biology will include research in five countries with undergraduate assistants.

Grad student **Jocelyn Holt** received \$1000 as a Newhall Southern California Ecology Grant.

Drs. Maria Elena Zavala and Steve

Oppenheimer were awarded \$100,000 by the National Institutes of Health toward purchase of a confocal microscope.

Dr. Steve Oppenheimer was awarded \$101,785 from NIH NIGMS for continuing his project, "Mechanisms of Adhesive Interactions."

Dr. Mary Pat Stein received an NIH grant to purchase a flow cytometer.

Dr. Mike Summers was awarded \$155,768 from NIH NIGMS for continuing his project, "Genomic Analysis of Akinete Differentiation."

Dr. David Gray and colleagues have received a 3-year working group grant from the National Evolutionary Synthesis Center, "Sexual selection and speciation."

Dr. Gini Vandergon and colleagues have received three grants connected with K-12 teacher training: a California Science Project grant, "San Fernando Valley Science Project" \$70,000, from the California Post-secondary Education

Commission, "Teacher Retention Initiative" \$100,000; and an on-campus grant of \$1,500, to fund **Greg Sherman** as this year's Tomorrow's Scientist scholar. 🐾

Professional Service

Dr. Mark Steele was appointed to the Advisory Council of the Channel Islands National Marine Sanctuary.

Dr. Robert Espinoza served on an NSF panel judging proposals related to organism-environment interactions.

Dr. Steve Oppenheimer was invited to be guest editor for a volume of *Infectious Disorders-Drug Targets*.

Dr. Paul Wilson was invited to be a book review editor for *The Bryologist*. 🐾

California State University
Northridge

Department of Biology
18111 Nordhoff Street
Northridge, CA 91330-8303



Bios: the Department of Biology Newsletter