Bios

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California State University Northridge

California State University, Northridge

Publications by Biology Faculty and Their Students*

Graduate student **Dave Bottinelli** published a paper with his advisor Dr. **Larry Allen** in *California Fish and Game*. Allen and colleagues also have a new publication in *Fisheries Research* on the return of the white seabass fishery.

A review paper from Dr. **Steven Oppenheimer**'s lab on "Carbohydrate-based experimental therapeutics for cancer, HIV/AIDS and other diseases," has appeared in *Acta Histochemica*; co-authors with Oppenheimer are former students **Maribel Alvarez** and **Jennifer Nnoli** who are currently in doctoral programs at UC Irvine and Sloan Kettering Institute, respectively. The same journal has also accepted another paper authored by Oppenheimer and Drs. **Edward Carroll**, **Cathy Coyle-Thompson**, and **Virginia Hutchins-Carroll** on "Hyalin is a cell adhesion molecule involved in mediating archenteron-blastocoel roof attachment."

Dr. **Paula Schiffman** is author of two chapters in a new University of California Press book titled "California grasslands: Ecology and management."

Several papers by Dr. **Maria de Bellard** and her students have appeared recently, among them an article in *Neuron Glia Biology* with student **O**. **Arman**; a chapter on glial cell function in health and disease in *Proceedings VII European Meeting* with students **M**. **Somerville**, **D**. **Marinez**, **D**. **Nambi**, **L**. **Kim**, and **M**. **Cornejo**; and another with student **U**. **Ndubaka** in *Acta Histochemia*.

Former marine biology graduate student **Kathy Morrow** has had a manuscript based on her MS thesis accepted for publication in the *Marine Ecology Progress Series*. The title of her work is "Shallow kelp canopies mediate macroalgal composition: Effects on the distribution and abundance of *Corynactis californica* [Corallimorpharia]." Kathy now is in a doctoral program at Auburn University.

Dr. **Tim Karels** and colleagues H. Trevino, A. Skibiel, and F. Dobson have had a paper entitled "Why causal analysis of threats to oceanic avifaunas is important: Reply to Blackburn, et al." accepted for publication in *Conservation Biology*. Karels and co-authors also had a paper accepted by the *Journal of Biogeography*.

Dr. **Robert Espinoza** contributed the entries on three lizards in a soon-to-be-published book by L. L. C. Jones and R. Lovich entitled "Lizards of the American Southwest: A Photographic Fieldguide." The species he wrote about were: the Western banded gecko (*Coleonyx variegates*); the Western fence lizard (*Sceloporus occidentalis*); and the Mojave fringe-toed lizard (*Uma scoparia*). Espinoza, with Argentine graduate student S. Quinteros, also has had a paper, "A hot knot of toads: Aggregation provides thermal benefits to metamorphic Andean toads," accepted for publication in the *Journal of Thermal Biology*. The paper was also featured in *BBC Wildlife* in an article titled "Hot-packed toads."

Drs. **Steve Dudgeon** and **Janet Kübler**, and students **Kyla Benes**, **Stacey Krueger**, **P**. **Mroz**, and **C**. **Slaughter** are co-authors on a paper accepted for publication in the *Journal of the Marine Biological Association of the United Kingdom*; the paper is entitled "On the use of experimental diets for physiological studies of hydrozoans." Dudgeon, with colleagues P. Petraitis and J. Fisher, is also co-author of a section on "Ecosystems: Rocky intertidal shores" in the *Encyclopedia of Ecology* edited by S. E. Jorgensen and published by Elsevier Press.

Dr. **Paul Wilson** is co-author of a paper published in the *International Journal of Plant Sciences*; he and colleagues also have a paper out in the *New Phytologist*.

* Readers will find full citations & often PDFs at *www.csun.edu/biology/faculty*.

Recent Research Presentations at Scientific Meetings

Dr. **Robert Espinoza** was an invited symposium speaker at the Federation of American Societies for Experimental Biology, Summer Research Conference in Snowmass, Colorado. More recently, Espinoza presented his research at the *Museo de Ciencias Naturales*, Universidad Nacional de Salta, in Salta, Argentina, where he is currently spending his sabbatical year.

Azalia Contreras and **John Vitale**, students of Dr. **Steven Oppenheimer**, presented a poster paper on "Sea urchin hyalin from *Lytechinus pictus* may mediate archenteron-blastocoel roof attachment" at the 47th national meeting of the American Society for Cell Biology in Washington, D.C. Oppenheimer, Dr. **Edward Carroll** (Chemistry) and **Virginia Hutchins-Carroll** were co-authors.

In July, Dr. **Janet Kübler** presented "Biology for nonbiologists" at a Flathead Lake, Montana, meeting of the Biomimicry Institute, a nonprofit organization supporting biologically inspired design, biomimetics and biomimicry.

Graduate student **Christian Rodriquez** presented his research at the American

Botanical Society annual meetings this summer in Chicago; his advisor is Dr. Virginia Vandergon.

Abigail Poray and **Melissa Spitler**, both graduate students working with Dr. Robert Carpenter, made oral presentations on their thesis research in Moorea, French Polynesia at the 88th Annual Meeting of the Western Society of Naturalists (WSN) in Ventura. Two undergraduate students who did their work under Carpenter's guidance at the Hawaiian Institute of Marine Biology, **Stella Swanson** (CSULB) and **Hannah Blossum** (Northeastern U.), also presented posters.

Also presenting posters at the WSM meeting and their titles were: **Christina Vasquez**, "The Influence of colony architecture on morphological plasticity in the hydroid Podocoryna carnea"; **Carly Ryan**, "Characterizing colony form in colonial hydrozoans," both from Dr. Steven Dudgeon's lab; **Dawn Bailey,** "Effects of predator accumulation on community structure of fishes in marine protected areas"; **Jessica Bredvik**, "Productivity of an herbivorous temperate marine fish, *Girella nigricans*." Vasquez and Ryan work with Dr. Steven Dudgeon, Bailey and Bredvik with Dr. Larry Allen.

At the WSN Dr. **Mark Steele** and colleagues presented a paper entitled "Large-scale experiment reveals effects of habitat structure on coral reef fish assemblages."

Two of Dr. **Peter Edmunds'** graduate students, **Nancy Muhllehner** and **Hollie Putnam**, each presented a paper at the Society for Integrative and Comparative Biology meeting in San Antonio Texas. Their papers were entitled, respectively, "Rising CO_2 disproportionately affects extension versus mass deposition rates in reef coral," and "Flexibility of coral response to diel thermal fluctuations."

Jessica Dooley presented a poster this past summer at the Cooper Ornithological Society meeting in Moscow, Idaho. Jessica also attended the Wildlife Society conference in Tucson this fall. Her advisor is Dr. Fritz Hertel.

Dr. Sean Murray's graduate students **Adorina Moshava** and **Arbella Moshava** presented posters at the meeting of the American Society of Microbiology, Southern California Branch. Their poster topics were, respectively, transcriptional regulation during the bacterial cell cycle and regulation of proteolysis during the bacterial cell cycle.

Two students who work with Dr. Michael Summers presented posters at the American Society for Microbiology Southern California Branch (SCASM) in San Diego. The poster presented by **Adrian Paz** was entitled "Confirmation of akinete-specific expression for highly expressed genes F0784 and R3708 in *Nostoc punctiforme*." **Marisabel Oliveros**, whose poster was on "Initial characterization of putative akinete specific genes in *Nostoc punctiforme*" was awarded First Prize for her presentation and a trip to the American Society for Microbiology General Meeting in Boston.

Jedi Lobos, a graduate student of Dr. Paul Tomasek, also presented a prize-winning poster at the SCASM meeting, and also was awarded a trip to the American Society for Microbiology General Meeting in Boston.

Graduate students **Odette Arman** presented a poster and **Deborah Nambi** presented a talk at the Society for Neuroscience meeting in San Diego. Their faculty advisor, Dr. **Maria Elena de Bellard**, presented a poster on behalf of **Lisa Rotenstein**, a Harvard student who worked with her while in high school.

Biology Students Present at Symposium; Five Win Prizes

In November, 35 Biology undergraduate and graduate students presented their research findings at the University's 12th Annual Student Research and Creative Works Symposium. Ten made their presentations orally, 25 as posters.

Five participants were awarded prizes for their work. **Nancy Muehllehner**, a student of Dr. Peter Edmunds, took First Place for an oral presentation on "Rising CO_2 disproportionately affects extension rates versus mass deposition rates in reef corals." Second Place in the oral category went to another Edmunds student, **William Goldenheim**, who spoke on "Positive interactions within intertidal plant populations." Third Place winner in the category was **Jenevieve Polin**, one of Dr. Michael Summers' proteges, who talked on "Up-regulation of 5 genes during akinete development in cyanobacteria."

For poster presentations, **Yasuko Hirakawa** from Dr. Rheem Medh's lab and another student shared the First Place award. Hirakawa's poster was entitled "Glucocorticoid evoked up regulation of the regulator of calcineurin 1 isoform 1 (RCAN1.1) correlates with apoptosis in human leukemic CEM cells." Second Prize for a poster went to **Svetlana Yusopova Rose**, a student of Dr. Michael Summers, who presented her work on "Characterization of akinete-specific genes."

Also presenting orally at the symposium, and their topics were: **Daniel Green**, "Detecting spatial variation in coral recruitment associated with temperaure along the southern coast of St. John, US Virgin Islands"; **Ronik Khachatoorian**, "Expression of human CRP gene in *Pichia pastoris*"; **Stacy Krueger**, "Reproductive effort in the life histories of the red alga *Macrocarpus papillatus* at two spatial scales"; **Alex Li**, "The effects of pocket gopher (*Thomomys bottae*) disturbances on grassland community composition in Santa Monica Mountains"; **Rebecca Miller**, "Molecular evolution of DFR in the anthocyanin pathway of California tarweeds and Hawaiian silverswords"; **Abigail Poray**, "Physiological consequences for coral reef macroalgae inhabiting refugia from herbivores"; and **Melissa Spitler**, "Impacts of herbivory on the population dynamics of two fucoid species in Moorea, French Polynesia."

Biology students presenting posters and their topics were: **Guadalupe Aguirre**, "Transposon mutagenesis of Arthrobacter GFB100"; **Sucorro Aguirre**, UV mutagenesis of *Arthrobacter* GFB100"; **Taylor Anderson-McGill**, "Reproductive trade-

offs in desert rodents: Effects of environmental manipulations on Merriam's kangaroo rats (*Dipodomys merriami*)"; **Odette Arman**, "Role of Slit2 in the mechanism of migration and guidance of trunk neural crest cells"; **Jessica Beach**, "Regulation of glucocorticoid-evoked leukemic CEM cell apoptosis by the *C. elegans* ces2 ortholog E4BP4"; **Leticia Carrillo**, "A conserved palindrome hypothesized to be involved in akinete gene expression"; **Elizabeth Czornyj**, "Isolation of methanogen inhibitors from bovine rumen"; **Vernita Davis**, "The neuroprotective effects pf 17--estradiol in the spastic *Han-Wistar* rat"; **Wilber Escorcia**, "Akinete differentiation in *Nostoc punctiforme*: A survival mechanism in response to environmental change"; **Laura Feucht**, "Immunolocalization of beta-glucosidase in cold-stressed root tips of *Zea mays*"; **Allyson Folster**, "Expressing carbofuran hydrolase in *Escherichia coli*"; **Mark Harris**, "Loss of the AccD gene from the Poales"; **Jenna Krug**, "Effects of variation in predator density on growth and survival of the temperate reef fish *Lythrypnus dalli*"; **Jedidiah Lobos**, "Expression of the carbofuran hydrolase gene (mcd) in alternative hosts"; **Adorina Moshava**, "The P1 promoter of the *Caulobacter crescentus* cell cycle master regulator CtrA is necessary for normal growth and development"; **Arbella Moshava**, "The proteolysis of the cell cycle master regulator GcrA in *Caulobacter crescentus* swarmer cells is ClpP-dependent"; **Carri Musser**, "The effects of E4BP4 on GR-mediated transcriptional regulation of apoptosis"; **Marisabel Oliveros**, "Initial characterization of putative akinete specific genes in *Nostoc punctiforme*"; **Adrian Paz**, "Confirmatin of akinete-specific expression for highly expressed genes F0784 and R3708 in *Nostoc punctiforme*"; **Jarrod Peercy**, "Corticosteroids and alarm calling behavior of the California ground squirrel"; **Miguel Rocha**, "PVL production by CA-MRSA is attenuated by subinhibitory concentrations of antibiotics that block protein synthesis"; **Christian Rodriguez**, "Anthocyanin pathway gene duplication of Hawaiian silverswords and California tarweeds"; **Araceli Vasques de Carrillo**, "Regulation of inorganic carbon uptake by CRP in Cyanobacteria"; and **Dona Wisidagama** , "YME1 promoter regulation."

Biology Well Represented at CSUPERB Symposium

In January, many Biology students, both graduate and undergraduate, presented posters of their research at the 20th Annual CSU Program for Education and Research in Biotechnology (CSUPERB) Symposium in Oakland. Those presenting and their poster titles were: **Odette Arman**, "Role of slit in neural crest delamination"; **Anthony Daulo**, "Evaluation of the ability of BTG1 to bind to and modulate the transcriptional activity of GR in glucococorticoid-evoked lymphocyte apoptosis," **Wilbur Escorcia**, "Are genes in the OmpR family involved in cyanobacterial akinete differentiation?"; **Karen LeGrand** and **Jenevieve Polin**, "Confirmation of akinete cell-type-specific gene expression"; **Adorina Moshava**, "The P1 promoter of the *Caulobacter crescentus* cell cycle master regulator CtrA is necessary for normal growth and development"; **Arbella Moshava**, "The proteolysis of the cell cycle master regulator GcrA in *Caulobacter crescentus* swarmer cells is ClpP-dependent"; **Adrian Paz**, " Confirmation of akinete-specific expression for highly expressed genes F0784 and R3708 in *Nostoc punctiforme*"; **Christian Rodriquez**, "Anthocyanin pathway gene duplication in Hawaiian silverswords and California tarweeds"; **Svetlana Yusopova Rose**, "Characterization of akinete-specific regulatory genes in *Nostoc punctiforme*"; **Richard Sims** and **Michael Zaky**, "Epigenetic control of developmentally regulated B cell gene silencing"; **D**. **Roonalika Wisidagama** and **Kim Vaccaro**, "Genetic and epigenetic control of YME1 expression"; and **Grant Weiss** and **Anne Tran**, "Identifying *Legionella* effector-effector interactions."

Extramural Activities of Biology Faculty, Staff and Students

Dr. **James Hogu**e presented a talk on "Beetles of southern California and their relationships with native vegetation" to the Los Angeles / Santa Monica Mountains chapter of the California Native Plant Society.

Dr. **Steven Oppenheime**r has been asked to serve on a review panel for R13 grants from the National Institute of Health, National Institute of General Medical Sciences.

Dr. **MariaElena Zavala** was a panelist at the National Academy's Ford Foundation Fellows Conference, was appointed to chair the American Society for Plant Biology's Minority Affairs Committee for a three year term, and serves on a review committee for the National Human Genome Research Institute. Zavala also organized a session at the Society for Advancement of Chicanos and Native Americans (SACNAS) conference, sponsored by the American Society for Cell Biology, and was accompanied to the meeting by nine CSUN students. Her enormous contribution to minority education at CSUN via the MARC and MBRS programs was recognized in an October issue of *Science* in an article entitled "Meaningful mentoring—Native American and Latino success stories."

Dr. **Maria Elena de Bellard** also attended the SACNAS meeting where she spoke on "Mechanisms of neural crest migration," a paper based on data collected by her and her students.

Dr. **Paul Wilson** has given two talks at UC Berkeley where he is currently spending his sabbatical leave. One talk was on stable strategies in pollination syndromes, the second on moss niches.

Dr. **Peter Edmunds** and his student, **Nancy Muhllehner**, were invited attendees at a National Science Foundation-sponsored workshop on ocean acidification at Scripps Institute of Oceanography in San Diego.

Dr. **Larry Allen** gave an invited presen-

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The Students' Forum

This space is used for students to report on particularly exciting activities they have done related to the Biology major. In this issue we feature articles by five students: ***Abigail Poray*** *and* ***Melissa Spitler*** *are conducting their MS research on algal distribution at the UC Berkeley Gump Marine Lab on the French Polynesian island of Moorea.* ***Daniel Green*** *and* ***Hollie Putnam****, both graduate students, spent their winter breaks in the Caribbean working to educate the public about the importance of coral reefs and the fragility of the reef ecosystem.* ***Marisabel Oliveros*** *is an undergraduate doing research with Dr. Michael Summers. Students who would like to contribute to this space are invited to contact the editor.*

Unexpected sex? Go to plan B

—Abigail Poray

My trip to Moorea, an island near Tahiti, began with a short-lived New Year's celebration onboard Air Tahiti Nui. What followed was eight hours of fretting about what critical supplies I might have forgotten, and a feeling of anxiety about what I would find in the study sites I had set up six months previously.

During a trip in May and June, I had plotted the distribution of macroalgae (=seaweeds) across the reef and discovered that they tend to be restricted to crevices and holes of large coral heads. Few grow in open spaces. My job was to find out what determined where the algae grew.

Because Moorea's coral reefs have an extraordinary level of herbivory, others have suggested that the algae grow only in places inaccessible to grazers. Indeed, data from earlier studies strongly support this idea, but the earlier experiments only demonstrated that microhabitats deter herbivore consumption. I wanted to know *how* herbivory maintains these algal assemblages.

Focusing on *Halimeda minima*, a calcareous alga that commonly fringes most crevices and holes in the reef, I established herbivore exclusion cages outside the alga's preferred microhabitats, both where herbivores were present and absent. But this is where the "oh so very important" learning curve comes into play.

H. minima exhibits a mass spawning event each year, directing all its energy into reproduction. Then, after releasing its gametes, the alga dies. Unfortunately, I didn't learn this fact until I had established my cages and returned to California. In Moorea spawning occurs in October, and I had set my experiment to run from July until January, right through the spawning event. By the time I discovered this, it was too late to modify my design. I could only hope that the individuals I had chosen would be among the few that failed to reproduce this year.

After I arrived in Moorea in January and had settled down, I was soon in the water checking my study plot. Where my alga had flourished in June, I found empty crevices and holes. Of the thirty microhabitats I had targeted, only four contained mature *H. minima*. Compared with what I had seen six months earlier the entire reef appeared nearly devoid of my alga. But not totally, for almost every crevice and hole sheltered a recently settled *H. minima* recruit—very small, mostly 2-10 mm long—products of the spawning event.

I mourned the death of my algae only briefly. Our stays in Moorea are short and when plan A fails, we have to be ready to move quickly to plan B, or even plan C. My original plan in tatters, I accepted the unexpected turn of events as a unique opportunity to explore another aspect of algal life cycles—the patterns in algal settlement—and set about monitoring the survival and growth of the new recruits. Fortuitous though these data were, I expect that they will provide a snapshot in time of *H. minima*'s life, something I probably would not have seen had I tried to plan it.

But I didn't completely abandon my exclusion experiment. Instead, I reset my cages with a different species, *Amansia rodantha*, a red fleshy alga. Like *Halimeda*, *A. rodantha* is very abundant on the reef, but unlike *Halimeda* it does not participate in mass spawning events.

Now back in Northridge, I once again wait for summer and my return to Moorea. But this time I plan to go armed with backup plans D and E.

Poisson cru or *unagi*?

—Melissa Spitler

Moorea is an island paradise with various shades of turquoise water, rich green foliage and vibrantly colored marine life. Those of us who do our research here reside in bungalows with a 180° view of Cook's Bay and the ocean beyond. I am enamored with the place, the people, and the reefs.

That being said, it is research that I'm here for, and by definition this is not a vacation. Indeed, sometimes life here is not at all pleasant, regardless of the persistent sunshine, the vistas, and the fresh *poisson cru*, a local tuna dish with coconut milk. But when challenges arise, I realize that I'd much rather be having a bad day here than back at the office!

And what, you ask, could possibly constitute a 'bad day' in Moorea? To expand (and somewhat exaggerate) on the lamentations of my fieldwork, let me describe a few experiences and lessons I've learned at 'the Gump' over the last few years.

In the past three field seasons I've discovered that there is never enough time, my "effort to sample size" ratio is always too high, I can always use more zip ties, and I should have purchased that other bottle of gin at the duty-free shop. As Dr. Edmunds is fond of reminding us, "If science were easy, everyone would do it."

But this is little comfort when you've just been beaten into a coral head by waves that rush by you at 2 m/sec, lift up your body as the crest passes, then drop you at least a foot in the next breath. All this while waves lap into your snorkel, the incoming seawater obstructing your next effort to inhale. Shallow breathing is easy

after kicking with all your might up-current for 50 m as you look for the few coral heads and/or cages you set up during the previous field season.

Waves come in sets; you have about two minutes of reasonable flow until another large wave set catches you off guard. If you are quick enough (with gloves, because woe be unto you should you grab an urchin!), you can just barely grasp the nearest coral head and prevent yourself from being tossed meters away from the substrate on which you are so painstakingly attempting to quantify algal cover and abundance.

While the water rushes past, it is critical to not look around for sharks or other charismatic megafauna. Should you do so, your mask likely will be ripped from your face and washed away in the surge. I no longer shudder every time I see the black fin tip of a reef shark meandering by, but I am wary of the moray eels that I often encounter as I count my algae. Usually, I discover the eels too far into my counting to abandon my project, and I'd lose even more time trying to keep an eye on the creatures with the glassy eyes and gaping, tooth-filled mouths. I am careful, however, for I prefer not to lose any digits, as came close to happening three years ago. On that occasion, I experienced the impact of the eel's backwardly curving teeth "first hand." (Pun intended.) Eight stitches and three years later, I have a cool scar and a well-developed love of *unagi*. (For non-sushi lovers, that's "eel.")

On my third trip to Moorea, as a research assistant, I left with dengue fever, also known as break bone fever. A class of 18 students, three TA's, and three professors were also victims of the fever-inducing malady transmitted by mosquitoes. Eight days of sleep and lots of liquids left us pounds lighter and DEET friendly.

During my fourth trip, this time as a graduate student, we had 23 days of continuous rain. The top layer of the lagoon was brown and covered with debris. Boats flooded and nearly sank, and bathing suits and towels failed to dry, making all of us grateful to the one person who had thought to bring baby powder.

Compared to others, my most recent trip to Moorea was relatively successful. Not only did we have unseasonably nice weather and lots of willing hands to help with experiment preparation, deployment, and collection, but I made strides in my effort to understand the distribution of two large algae, *Sargassum mangarevense* and *Turbinaria ornata*. *Sargassum*, a fleshy, palatable alga dominates the reefcrest whereas *Turbinaria*, a less palatable species, thrives elsewhere. I expect soon to have answers as to why this pattern exists, but I say this with trepidation because my thesis committee will ultimately be the judge of that.

Despite the challenges of working so far from home, Moorea really is a gorgeous and pleasant place to work. I treasure every day, every snorkel, and every data point. Despite weather, living conditions, or the 30th day in a row of baguette sandwiches, I wouldn't trade it for the world!

Research in St. John

—Daniel Green

About 3,500 miles southeast of L.A. is the small Caribbean island of St. John in the US Virgin Islands. It was here during the winter break that I spent two weeks with an undergraduate field assistant recovering settlement tiles and temperature loggers from the coral reefs that I am studying.

With these devices I'm monitoring spatial differences in coral recruitment with the goal of understanding how small-scale differences in seawater temperature affect the survival of young coral. Already, my initial results are providing insight into why one reef on the island may be relatively healthy, with a lot of juvenile corals, while another reef just a short distance away has very limited recruitment.

The people of many Caribbean islands rely on the coral reefs for food and for income via tourism. But most tropical reefs are showing signs of tremendous stress, the causes of which are only beginning to be understood. One obvious cause on St. John and other islands is the lack of sewage treatment and runoff, at least until very recently.

Fortunately, on most islands education among the populace about the coral reefs is improving. As a result, the locals are showing a greater respect for their reefs, and many environmentally friendly programs have been implemented.

Although my study is only a small part of the picture, I'm hopeful that my research will shed even greater light on the fragility of coral reef ecosystems and demonstrate how even small disturbances can have great effects. This, in turn, will contribute to further education of the inlands' inhabitants and influence the important decisions they must make regarding their nation's coral reefs.

Teaching in Belize

—Hollie Putnam

During January, I spent two weeks in Caye Caulker, Belize, co-teaching a Coral Reef Ecology (CRE) class with my undergraduate advisor, Dr. Edward Burkett, from the University of Wisconsin–Superior (UWS). A part of the Caribbean Coral Reef Studies (CCRS) program at UWS, the class introduces students to the coral reef ecosystem. Class work involves two weeks of lecture and underwater species identification, and culminates in small group research projects.

For some CRE students the class was their first opportunity to travel outside the US and their first time diving on a coral reef. The CCRS program also introduced me to coral reefs several years ago when I participated in a CRE class in Mexico. After that class I made two research trips in Belize, an experience that was the driving force behind my chosen career as a marine biologist.

After leaving UWS, I remained in touch with the CCRS program, and this fall was asked by Dr. Burkett to co-teach the class. I jumped at the chance to assist in a program that had been so valuable in my education and quickly discovered my new

students were as eager to dive, observe, and learn as I had been!

I truly enjoyed sharing my knowledge of reef corals and telling the students of the various opportunities to pursue study at a higher level (such as those I've had working with Dr. Edmunds at CSUN). It was great to see the students' enthusiasm in a new environment and to recall my own passion for coral reefs. The eight students who completed the CRE class are now eligible to join the CCRS research team that does ecological monitoring on the reefs of the Caye Caulker Marine Reserve just inside the Meso-American Barrier Reef tract in northern Belize. Perhaps you, too, would enjoy and profit from such an experience. If so, I encourage you to look for similar programs offered in your area of study. It can change your life, just as it did mine!

My summer at Dartmouth

—Marisabel Oliveros

A senior Biology major, I study gene regulation and cellular differentiation in the cyanobacterium *Nostoc punctiforme* in Dr. Michael Summers' lab. Because I'm in the MARC program, I was encouraged to become involved in summer research at another university, a great opportunity to live away from home and to see how science is done elsewhere. I applied to and was accepted at Dartmouth College in Hanover, New Hampshire.

Eight students were in the 10-week summer program, and they came from all over the U.S. Assigned to work in a lab where the investigators were studying autoimmune hepatitis, I was given the task of devising a way to assay neutrophils in a mouse model. Immunology was completely new to me—I'd never had a course in it!—and I had never worked with mice. But with the help of a book provided by my mentor I quickly learned the basics of immunology, and by the end of the summer I had learned to dissect mice, to work with antibodies, and to quantify cells in liver samples using flow cytometry.

In July, I presented a poster on my summer work at the Leadership Alliance National Symposium in Connecticut. At the symposium I also had a chance to meet students from many parts of the country doing research in different fields, and to attend panel discussions led by graduate students and admissions officers from various school, from whom I got a lot of tips on the graduate school application process.

Though research was the focus, the Dartmouth program also offered many other activities: a GRE preparatory course, journal club meetings, talks on ethics in research, graduate school application seminars, even recreational activities. Among other fun things, students in the program visited the famous Marine Biological Laboratory in Massachusetts, Martha's Vineyard, Lake Champlain in Vermont, and several restaurants where we had a chance to eat good food! At the end of the summer we had another poster presentation of our research to which many Dartmouth graduate students, our mentors and the principal investigators came.

My summer proved to be a great experience, an opportunity to live in a small town in the East, to visit new places and to meet new friends. But most important it was an opportunity to explore life as a graduate student without being one, and to do research in a scientific discipline without having to commit to it. I have no doubt that I can now make a more informed decision on where and to what programs to apply when I'm ready to start applying to graduate schools.

What are those things anyway?

It's hard to miss the virus-like structures. Poised like a fleet of space ships, they stand in formation just south of the Student Union along the pathway from the G4 parking lot. But what are they? For an answer, Bios turned to **Brenda Kanno**, manager of the Botanic Garden.

"Those 'space ships' are actually cooling towers that will become the heart of a sub-tropical rainforest. We expect planting of the forest to begin in late summer or fall, mainly using plants rescued from the south side of the Botanic Garden that was closed to make way for the new science building, Chaparral Hall."

The project, says Kanno, is an outgrowth of CSUN's Fuel Cell Facility constructed last year. The brainchild of Physical Plant Management (PPM) director, Tom Brown, the rainforest will utilize the water and carbon dioxide that the fuel cells produce, thus minimizing the effects of energy generation on the environment. In addition, heat from the satellite chiller facility will sustain the plants during winter.

According to Kanno "The cooling towers will emit carbon dioxide at varying heights to facilitate uptake by the foliage, and coincidentally, the underground CO_2 lines will warm the soil and plant roots. Moreover, the towers will generate a heavy mist around the plants, simulating the highly humid rainforest environment."

To do this, municipal water at ambient temperature will enter each cooling tower where it will be sprayed onto a multi-folded layer of plastic to evaporate. The evaporation process will cool much warmer water coming from the nearby satellite chiller facility, the large gray building east of the Botanic Garden. Because the satellite chiller is powered with electricity generated by the adjacent fuel cells, unlike the University' main chiller that draws power from the DWP, its use will save the University considerable money by avoiding DWP's high peak surcharges.

Although the towers are of a standard design, their use to support a sub-tropical rainforest is unique. The innovative planning and design of the rainforest and of accessory features of the towers are products of a team of engineering students working under Brown's guidance. Technical advisors on the project, in addition to Kanno, include: Ben Elisondo of PPM; Nathaniel Wilson, Facilities Planning; Dr. Sidney Schwartz, Engineering Department; and Jai Agaram, CSU Mechanical Review Board Engineer.

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tation at the University of New Orleans on "A fisheries independent assessment of the returning white seabass fishery off California." Allen also recently finished a term as President of the 91-yr-old Western Society of Naturalists. As part of the society's annual meeting he organized and moderated the Presidential Symposium on "Marine reserves off California: What do we really know about their impact on marine fisheries?" In his role as president he also delivered the keynote address at the Presidential Banquet.

Dr. **Sean Murray** represented the Biology Department at the NSF Quality Education for Minorities workshop in Washington, D.C., in September.

Undergraduate **Carly Ryan** gave a talk on evolution to a 5th/6th grade class at Children's Community School, a progressive elementary school in Van Nuys that stresses hands-on learning, environmental diversity, and community involvement. Ryan's advisor is Dr. Steven Dugdgeon.

During winter break Dr. **Rheem Medh** presented a talk on "Genetic risk factors in Type 2 diabetes" at the 3C Con Cardiology and Diabetes Conference in Ahmedabad, India. While there she also explored potential collaborations with scientists at the Center for Cellular and Molecular Biology, a premier research institute in Hyderabed.

Brenda Kanno, Botanic Garden manager, helped the Los Angeles International Fern Society transfer its collection of ferns and associated plants to a new abode at the Los Angeles County Arboretum. Says Kanno, "The new growing area, including shadehouse and greenhouse facilities, will greatly facilitate the propagation of ferns and fern-companions by society members."

Dr. **Janet Kübler** was an invited instructor for the Placerita Canyon Natural Area Annual Volunteer Naturalist Training program. Placerita Canyon is regularly visited by our field courses and thousands of students in BIOL 100 labs.

Dr. **Cindy Malone** led workshops on careers in genetics and biology for the San Fernando Valley Branch of the American Association of University Women Brighter Horizons conference in January.

As part of his Fulbright Fellowship, Dr. **Robert Espinoza** co-taught (en Español) a 2-week (100-hour), graduate-level, herpetology course with two Argentine colleagues at the Universidad Nacional de Salta. The official course title was "*Bases Teóricas y Prácticas en uso en la Investigación de la Biología y Evolución de Anfibios y Reptiles*." Twenty-five students enrolled including a veterinarian and a professor from México. In addition, Espinoza has been appointed Associate Editor of *Cuadernos de Herpetología* (the journal of the Asociación Herpetológica Argentina). He also serves as assessment reviewer for South American reptiles (39 species) for the IUCN Red List for Threatened Species.

Dr. **Robert Carpenter** is President-elect of the Western Society of Naturalists and will serve as the group's president during 2008-2009.

Dr. **Virginia Vandergo**n was an invited participant at a National Science Foundation and Department of Education-sponsored conference on "Science, Technology, Engineering and Math (STEM). The purpose of the get-together was to discuss math and science partnerships.

Dr. **Sean Murray** was an invited speaker at the Southern California American Society for Microbiology Annual Meeting in San Diego. His seminar was entitled "Scientific serendipity: From tumor-targeting *Salmonella* to outer membrane barrier function." Murray has also reviewed a portion of a new microbiology textbook for W.W. Norton and Company, called "Microbiology: An evolving science" by Joan Slonczewski and John W. Foster.

As part of a nationwide teach-in on global warming, Dr. **Paula Schiffman** talked in January at the USU about how climate change has affected the distribution of California's native plants and animals.

Dr. Peter Edmunds' student, **William Goldenheim**, is currently teaching in Moorea for the East West/Three Seas Program while completing his research.

Faculty and Students Receive Grants, Awards, Donations

The National Science Foundation International Programs office has awarded $20,000 to Dr. **Peter Edmunds** and his UCSB collaborator, Dr. **Sally Holbrook**. The funds will be used to send eight faculty and students from CSUN and UCSB to Taiwan to develop collaborations with marine scientists there. Edmunds and his UCSB colleagues have also received a $704,000, 3-year grant from NSF's Advancing Theory in Biology program for their project "Homeostasis, stoichiometry, and dynamic energy budgets at multiple levels of biological organization."

Dr. **Virginia Vandergon** has received three grants, each for $100,000, from the California Science Project, the California Post-secondary Education Commission, and the Teacher Retention Initiative, to support her science education endeavors. She also obtained a $1,500 campus grant from the Service Learning Scholar program and a $2,000 Service Learning Grant to support the "Tomorrow's Scientists" program that brings 7th graders from local schools onto campus to experience science in action.

Dr. **Robert Espinoz**a and Argentine colleagues (F. B. Cruz, M. G. Perotti, M. d. C. Diéguez, and D. Milano) have received $72,012 from *Agencia Nacional para la Promoción Científica y Tecnológica, Argentina* (Argentina's equivalent of NSF). Funds will be used for their study of "Responses of ectothermic organisms of the Patagonian region to climate change: Patterns of distribution, tolerance ranges, and adaptations" through 2010.

Two of Espinoza's graduate students have also received grants. **Christopher Rodriguez** received a grant from the Southern California Academy of Sciences to support his research efforts, and **Christine E. Bruno** received a $400 Sigma Xi Grant-in-aid of Research to support her thesis project on "Geographic variation in photolyase activity and the sublethal effects of UV-B exposure in the Andean

toad *Bufo spinulosus*."

Dr. **Sean Murray** received a faculty-student collaborative seed grant of $15,000 from the California State University Program for Education and Research in Biotechnology (CSUPERB) to support a project entitled: "Regulated transcription and proteolysis of master regulators during a bacterial cell cycle."

Graduate student **Dawn Bailey** was awarded a $1500 CSUN 2007-08 Associated Students Scholarship to support research she is conducting under Drs. Larry Allen and Mark Steele's guidance.

Christina Vasquez, who works with Dr. Michael Summers, received a California Predoctoral Scholarship of $1,000.

Jessica Beach, a graduate student in Dr. Rheem Medh's lab, was awarded a $2000 CSUN Graduate Equity Fellowship to support her research efforts.

The following students received grants from CSUN's 2007-2008 Graduate Thesis, Project or Performance Support Program: **Guadalupe Aguirre** and **Socorro Aguirre**, both students of Dr. Paul Tomasek; **Chris Bowman-Prideaux**, who works with Dr. Paula Schiffman; **Jenna Krug**, one of Dr. Mark Steele's students; and **Genevieve Polin** and **Svetlana Rose**, who work in Dr. Michael Summers' lab.

Two of Dr. MariaElena Zavala' students have received awards: **Laura Fuecht** won a Thesis Completion Award from the GRIPS office and undergraduate **Karen LeGrand** was honored with a scholarship to attend the Stanford Preview Program.

Sarine Shamarian, a high school student working with Dr. Steven Oppenheimer, received a fellowship from the Southern California Academy of Sciences.

Drs. **Cindy Malone**, **Mary-Pat Stein** and **Maria Elena de Bellard** acquired about $50,000 worth of equipment and lab supplies from Amgen Corporation. The materials and equipment, though used, is completely functional and will soon be used in many classes and research labs.

Microbiology Student Association

Microbiology affects many areas of science—ecology, virology, immunology, genetics—as well as virtually every aspect of medicine. The Microbiology Student Association (MSA) offers students a chance to engage in activities that can expand their knowledge of the "microbe world."

The MSA, an official student chapter of the American Society for Microbiology and an accredited charter club at CSUN since 1984, offers regular meetings at which invited experts talk about their current research, the role of microbes in medicine, and a wide variety of related microbiology topics. All interested students are invited to attend the meetings where they will have an opportunity to socialize with like-minded students, make professional contacts, gain important career information, and learn about advances in the field of microbiology.

One of the group's most important activities is attendance at local and national microbiology conferences where members often make poster presentations of their research efforts, participate in small group meetings with the finest professionals, and attend seminars focusing on the latest research and career opportunities.

Students interested in joining the MSA or who would like to know more about the organization are encouraged to check out the group's webpage at *http://csun.msa.googlepages.com* or talk with any of the club officers: **Odette Arman**, President; **Narine Arabyan**, VP; **Elizabeth Czornyj**, Secretary; **Forough Zallaghi**, Treasurer; and **Edward Meltser**, Publicity Coordinator. Dr. **Larry Baresi** is the club's faculty advisor.

New Biology Staff Members

The Biology Dept. welcomes two new members to its technical staff.

Joining **John Brown** in the stockroom will be **Mark Felix**, a recent biology graduate and former student assistant in the Biology Office. Mark will be responsible for handling all orders for supplies and services, and for insuring that needed materials are always on hand.

The functioning of the Botanic Garden and greenhouse complex will be greatly facilitated by the addition to the staff of **Phillippe Lee-Gabriel**. Phillippe, a horticulturist who previously worked at the San Francisco Zoo, will be working very closely with the facilities manager, **Brenda Kanno**, to keep the garden in good shape and guarantee plants needed for class use are available on time.

Professors Seek Student Help

Dr. **Steven Oppenheimer** invites students interested in joining his research efforts to visit his lab in EH 2005, where studies of cancer and developmental biology are on-going. In addition to Oppenheimer, students have an opportunity for collaborative efforts with Drs. **Edward Carroll**, **Stan Metzenberg**, **Cathy Coyle-Thompson**, and **Virginia Hutchins-Carroll** on NIH-funded projects.

The Near-shore Marine Fisheries Research Program needs students to help collect field data. Says Dr. **Larry Allen**, fisheries program director, "Our research involves intensive field work and we need the help of many student to accomplish it. I guarantee that those who participate in our studies will gain invaluable research experience." Students interested in helping are encouraged to contact **Brent Haggin** in MH 4112 or via phone at 677-4037.

Want to conduct cutting edge research? Want to work on problem that could help alleviate hunger? Dr. **MariaElena Zavala** is looking for students to work in her laboratory. Her studies focus on plant development and hormone regulation using the model plant, *Arabidopisis.* You'll find her in CS 3207.

Calling all teachers! Immersion, Inquiry, Foss..

"If any of the above words sound vaguely familiar, this program is for you!" says Dr. **Virginia Vandergon**, who invites all local teachers interested in science to join her and colleagues in a week-

long professional development intitute this coming summer.

According to Vandergon, "Teachers who have participated in the past have found the programs rich in ideas for teaching science and extremely helpful in providing a forum for support from other teachers, district experts and university experts. We offer several grade-level-oriented programs so pick one that best fits your needs. "

Program participants may qualify for a stipend and will have opportunities to apply for mini-grants to cover the cost of supplies. For more information contact Vandergon at *virginia.vandergon@csun.edu* or visit *www.csun.edu/science/csp*.

Minority Research Program News

"Summer is great time to participate in research programs," says Dr. **MariaElena Zavala**, Director of the MARC (Minority Access to Research Careers) and MBRS (Minority Biomedical Research Support) programs. "But, if you are thinking about this coming summer, you need to act now."

Many of the summer programs pay for travel to and from the site, room and board and offer a stipend! "Earn while you learn," says Zavala.

Flyers about numerous summer programs and internships are now available in the CASA (Center for Achievement in Science and Academics) office, EH 2128. Office hours are Monday to Friday, 9:00-5:00.

Students wanting to know more about graduate school, what's needed for preparation and how to apply, are invited to attend a MARC/MBRS workshop. The workshop will be held in EH 2102B from 3:00-5:00 on March 5. "You need not be a minority student. All are invited."

Student Research Abstracts Journal Published

The award-winning, Library of Congress-listed, 2007 issue of the *New Journal of Student Research Abstracts* was published in November. Dr. **Steven Oppenheimer** is journal editor.

The journal publishes short summaries (abstracts) of research done by K-12 students under the guidance of their teachers. Says Oppenheimer, "I believe the journal is a major vehicle for turning kids on to science, as evident from many testimonials from teachers, students and parents."

Costs of publishing the journal this year was covered by a $50,000 donation from the Van Nuys Airport. Says Oppenheimer, "This is a great example of a business-university partnership that has produced a very worthy product, the first of its kind in the world. It's one small but important step towards solving a national security crisis, because the U.S. is not producing enough scientists. China and India are overtaking us in this area by leaps and bounds."

K-12 students and teachers interesting in contributing to the 2008 issue are encouraged to contact Oppenheimer at *steven.oppenheimer@csun.edu*. Deadline for submissions is June 1, 2008.

Reminders from the Advisement Center

Advisement Center hours

Students are invited to stop by the Biology Advisement Center in EH 2133 to have academic questions answered. Faculty advisors Drs. **Joyce Maxwell** and **Daniel Odom** are assisted this semester by graduate student **Alex Li**. Maxwell sees students by appointment Mondays, noon–5 PM and Fridays, noon–4 PM. Walk-in advisement (no appointment needed) is available noon–4 PM, Tuesdays and Thursdays with Odom, or noon–5 PM Wednesdays with Li. The office is closed mornings and evenings.

Upper-division Writing Exam required for graduation!

Students expecting to graduate must attempt the Upper Division Writing Proficiency Exam no later than the semester in which they complete 90 units. Students planning to graduate in spring 2008 must pass the exam no later than May 31. For more information call the Testing Office, 677-3303.

Expecting to graduate this spring or next year?

The deadline for filing a Graduation Evaluation and Application for spring or summer 2008 graduation was July 6, 2007. Late applications are accepted at Admissions and Records with a higher filing fee. Students may have their forms completed at the Biology Advisement Center. When completed, the forms must be submitted to the Admissions and Records Office.

Accessing advisement info

A free Biology Advisement Handbook provides invaluable information on program requirements and course equivalencies. The handbook can be obtained in the Advisement Center.

Career information available

Career sheets are available in the Advisement Center. Each sheet describes career opportunities associated with each option in the Biology major.

When the Ocean Beckons, Marine Biologists Heed the Call

Several members of Dr. **Robert Carpenter**'s lab spent January in French Polynesia conducting sampling of coral reefs around the island of Moorea as part of the LTER project. Among those who traveled to the south seas were students **Abigail Poray** and **Melissa Spitler**, and technician **Vinny Moriarity**.

Leaving winter behind for the austral summer, these travelers found themselves in generally good weather and moderate seas (if 4-6 ft. swells are moderate!). As a consequence, they were able to make more than 30 dives in 18 days to complete their sampling.

Says Carpenter, "Changes in the coral reefs are becoming evident as the coral predator, the crown-of-thorns seastar, has increased in abundance and is killing corals on the deeper portions of some reefs." The purpose of the sampling efforts, which will

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continue for many years, is to document and quantify such changes.

Perhaps not so exotic, but equally rewarding, many graduate students from Dr. **Larry Allen**'s Fish Lab spent the summer doing their research on Santa Catalina Island. Those involved included **Dawn Bailey**, **Jenna Krug**, and **Dave Wang**.

Marine Biology Semester at Catalina Planned for Fall 2008

A semester-long, 15-unit program in marine biology is again scheduled at Catalina Island for the fall semester. Intended for students with a serious commitment to environmental and marine sciences, the program focuses on the unique coastal marine environments near Catalina Island.

Program participants will receive an intensive exposure to marine biology via four courses taught by four CSUN Biology professors: Marine Biology (BIOL 421) taught by Dr. **Steve Dudgeon**; Marine Phycology (BIOL 504) taught by Dr. **Robert Carpenter**: Ecology of Marine Fishes (BIOL 531) co-taught by Drs. **Larry Allen** and **Mark Steele**; and Independent Research (BIOL 499 or 699).

All classes will be taught at the Wrigley Marine Science Center (WMSC) on Santa Catalina Island, 26 miles from Los Angeles. Right on the shoreline, the location provides immediate access to beautiful, pristine marine habitats and breathtaking island views.

Financial aid is available for qualified students. For more information, application procedures and deadlines, contact one of the above faculty, or Ms. **Kristy Kull** at the Ocean Studies Institute (*kkull@csulb.edu*). Brochures about the program can be obtained in the Biology Department office.

Tropical Biology Semester Planned for Spring 2009

The Tropical Biology Semester will be offered again in spring 2009. Says Dr. **Fritz Hertel**, one of the instructors, "After four weeks learning some basics, students will fly south to work for six weeks in neotropical jungles where they will engage in hands-on exploration of nature. The class then returns to Northridge where students will finish their projects and present their work in a poster session."

All students in the program enroll in the same four courses for a total of 16 units. For more details, students are encouraged to contact Hertel (*fritz.hertel@csun.edu* or 677-3353) or Dr. **David Gray**, the other instructor (*dave.gray@csun.edu* or 677-7653). If past experience is any indication, participants can expect an unforgettable adventure and a fantastic learning opportunity.