

BIO SCI BRIEFS



A Newsletter for Alumni and Friends of the School of Biological Sciences

FALL 2008



DEAN'S MESSAGE

Welcome to the 2008-2009 school year. A lot has happened since our last addition. I am pleased to report that at our recent commencement ceremony in June of 2008, we awarded 767 Bachelor of Science degrees, 24 Master of Science degrees and 41 Ph.D.'s. Our incoming class is the largest yet, with 4,751 undergraduates (up about 250 from last year) and 441 graduate students. I am very proud not only of the accomplishments of our recent graduates, but also of the quality and stature of our new class. The School continues to grow both in size and reputation.

Over the summer, *US News and World Report* ranked our School 32nd in the nation for the quality of our biological sciences program. Two of our departments were singled out for their outstanding contributions to graduate studies. Our Department of Neurobiology and Behavior is ranked 16th in the nation and our Department of Developmental and Cell Biology was ranked 21st. Another milestone of note is that on October 24, 2008, we broke ground on the new facility that will house the Sue and Bill Gross Stem Cell Research Center. This state-of-the-art facility will allow researchers from a diverse set of disciplines come together to fulfill the promise stem cell research holds for cures for some of our most devastating diseases. Finally, we are in the early stages of beginning plans for a new facility that will house our nationally recognized Institute for Brain Aging & Dementia.

We continue to add new events and lectures to our calendar about the variety of scientific discoveries taking place in our School. Some of them are listed at the back of this newsletter. I encourage you to attend any of these events that may be of interest to you. I hope you have a great Fall season, and I look forward to seeing you on campus.

Sincerely,

Al Bennett

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DONOR SPOTLIGHT

ARCS Foundation

The School of Biological Sciences is very appreciative of its seven year partnership with the Orange County Chapter of the ARCS Foundation. Their commitment to furthering the academic careers of graduate students in the sciences has been a tremendous asset to the School.

The ARCS Foundation is a national, nonprofit, volunteer group of women. The organization began in 1958 following the realization that the United States was lacking in a sufficient number of scientists, engineers, doctors and teachers to meet global challenges in science, including the launching of the first artificial satellite, Sputnik. A program was set up to donate scholarship monies to selected colleges and universities recognizing outstanding students in the fields of engineering, medicine and the natural sciences.

There are fourteen ARCS Foundation chapters nationwide dedicated to helping the best and brightest United States students (must be American citizens) by providing scholarships to scientists and engineers. Since its inception, national membership has raised over \$64 million and has funded more than 11,000 scholarships.

The Orange County Chapter was conceived under the leadership of Pat Beckman with 44 charter members consisting of community leaders, friends and University of California, Irvine supporters in Orange County. The chapter received its charter at the ARCS National Annual Meeting in Washington, D.C. on the 5th of June 1999.

Since the Chapter's beginning, ARCS Orange County has cumulatively awarded \$1,198,500 to 66 students in science and engineering at the University of California, Irvine. The School of Biological Sciences has received 23 of those fellowships. The School thanks the Foundation and all of the donors that made these awards possible. We look forward to many more years of successful partnership as we educate the next generations of innovative scientists.



From left to right: France Campbell, ARCS OC Chapter President; Kym Garrod, 2nd year ARCS scholar from biological sciences; Dr. Kenneth Janda, Professor of Chemistry; and Pat Beckman, ARCS OC Founder.

EXTERNAL RELATIONS UPDATE

Competitive Awards in Medicine, Dentistry, Pharmacology & Ophthalmology

Our undergraduate students in the School of Biological Sciences work very hard for their future. Today's students must compete not only with each other, but with thousands of other highly motivated students at peer universities who are driven by a shared ambition: the desire to provide top-quality health care.

Many of our students balance their significant work load with extra curricular activities that will help their admissions into graduate-level medical, dental, pharmacology and optometry schools. These schools competitively seek students who not only have high GPAs, but who also have genuine experience – through internships and volunteerism – working in their desired occupational field, often with underserved communities.

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FACULTY SPOTLIGHT



Faculty Highlight:
Dr. James Hicks
 Professor, Department of Ecology
 & Evolutionary Biology



Dr. James Hicks is a Distinguished Professor in the Department of Ecology and Evolutionary Biology, and appreciates the nature of change. As an evolutionary biologist, Dr. Hicks studies vertebrates, and specifically the cardiopulmonary interactions of creatures such as fish, reptiles and crocodiles. “Reptiles have a three chambered heart, with a shunt that allows blood to bypass the gas exchange with the lungs; however, crocodiles have four chambered hearts – like birds and mammals – but also have a shunt. We are trying to understand the function of the shunt, and whether it’s an evolutionary key for a critical organ.”

Dr. Hicks is a native of California, and graduated from Cal State Fullerton with a B.S. in Biology, after staying in Orange County to work at his family’s local dry cleaning business. His initial intentions were to become a medical doctor, but he became enamored with animals and animal physiology, and was referred to Dr. Albert Bennett at UCI (current Dean of the UCI School of Biological Sciences) by his faculty advisor at Fullerton. Dr. Bennett encouraged Dr. Hicks to pursue a graduate degree, and he went on to receive a Master in Biology and Ph.D. in Biomedical Sciences from the University of New Mexico School of Medicine.

Dr. Hicks went on to become a Postdoctoral researcher at the Max Planck Institute for Experimental Medicine in Göttingen, Germany, where he was exposed to renowned thinkers and scientists. He studied comparative respiratory physiology, and returned to the U.S. to Postdoc at the Scripps Institute of Oceanography on an NIH grant focused on the respiration/circulation system of animals – and specifically, crocodiles. After UCSD, Dr. Hicks taught cardiovascular physiology at Creighton University School of Medicine. In the early 90s, Dr. Hicks accepted a position at UCI in the Department of Ecology and Evolutionary Biology that would allow him to pursue pure research, and to grow with world renown colleagues who share similar interests.

Dr. Hicks credits his success to ‘not planning’ and to remaining open to change. An example of this philosophy is evident in his work relating to giraffes, and the effects of gravity on their cardiovascular system. The conclusions from this research enabled him to serve as a collaborator on the ‘space cycle’ at UCI (<http://spacecycle.hs.uci.edu/>), an exercise machine supporting human fitness in zero-gravity environments. As a result of his work on the UCI space cycle, Dr. Hicks’ was retained as the scientific advisor for mega-hit movie WALL-E, where he taught Pixar animators about the potential effects of zero gravity on human beings over a long period of time (700 years).

Dr. Hicks feels that film and media are ideal mediums for translating science to the general population, and exploring potential answers – and intellectual implications of these answers – to a younger audience. He advocates that students immerse themselves in science, essentially moving past pragmatism to reach personal fulfillment through quality research: “science for the sake of science.”

Dr. Hicks lives with his wife of 29 years and their three sons in Irvine, and enjoys attending his younger son’s water polo matches and older son’s heavy metal shows throughout the Orange County and Los Angeles areas:

(<http://nephilimband.com/main.html>).

Department of Ecology & Evolutionary Biology Research Projects

Our local environment, and the effects global biological changes have on our environment, is of the utmost importance to our community. Researchers in the Department of Ecology & Evolutionary Biology are actively conducting critical research in Orange County to better understand the causes of these changes to our ecosystems and are suggesting ways in which we can not only manage these changes, but in some cases reverse the negative effects. This map indicates some of the local areas in which our scientists are actively engaged in environmental research that will have lasting impacts on our neighborhoods.

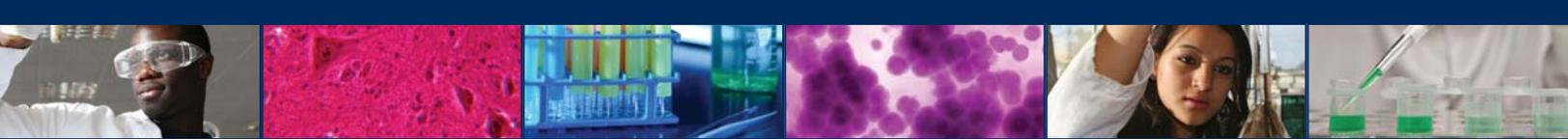
1 Coastal Reserve of Orange County Dr. Katharine Suding

Dr. Suding is working on artichoke thistle invasion and restoration of coastal grasslands. Artichoke Thistle (*Cynara cardunculus*; CYCA) is a deeply-rooted perennial thistle that is a problematic invader in disturbed grasslands, especially in coastal California regions. It has invaded large areas (over 4,000 acres) of the Nature Reserve of Orange County (NROC), adjacent to UC Irvine. The NROC, working with the Nature Conservancy (TNC), initiated a control program for CYCA involving direct application of herbicide to individual plants. Thousands of acres have been treated annually since 1994. While there is no question as to dramatic decline of CYCA, it is unclear what is replacing CYCA in the control areas, and whether the program will be sustainable following a major reduction in the active control program planned for 2015. Thus, Dr. Suding is testing important assumptions and questions necessary to better understand how exotic control programs influence plant community dynamics.



2 Great Park, Dr. Steven Handel

1,360 acres of the decommissioned El Toro Marine Corps Air Station in Irvine, CA is being transformed into one of the largest public parks in the nation. The plan includes a 2-mile long, up to 60-foot deep canyon, vegetated with native palms, woodlands and Mediterranean ornamentals. Also, a 2-mile long natural stream will be day-lighted, and a 2.5-mile wildlife corridor is being designed. The park provides invaluable habitats for native wildlife and will link the Santa Ana Mountains with the reserves on the Pacific shore. The Botanic Garden is the heart of the Great Park, where visitors will be able to observe Southern California's plant in habitats up close and in detail. Dr. Handel is developing the program and mission of this new major botanic garden. The Great Park is a tremendous biodiversity resource and will provide educational, recreational and cultural amenities to the people of California and to regional tourists. As a winner of an international competition, he helped develop the site-wide plan in association with Ken Smith Landscape Architect, Mia Lehrer + Associates, Enrique Norten's architectural firm and Fuscoe Engineering. Ecological expression will be an overlay throughout this vast landscape.



3 San Joaquin Hills **Dr. Michael Goulden and Katharine Suding**

This project seeks to experimentally investigate the effects of changed precipitation and nitrogen deposition on grassland and coastal sage scrub habitats in the San Joaquin Hills and the Santa Ana, San Jacinto, and San Bernardino Mountains. Researchers will use observations of the effects of interannual climate variation within the individual sites to understand the short-term effects of climate variability on ecosystem physiology and ecosystem function. They will compare across the sites along the gradient to predict the long-term effects of climate on community composition and ecosystem function. To test whether predictions based on gradients match how a system will respond to rapid change, they will manipulate water input at the experimental sites to understand how a change in moisture balance affects plant community composition, nutrient cycling, and plant water use. This will provide a further understanding of how multiple environmental changes interact to control the rate and direction of ecosystem response.

4 UC Irvine/Arboretum **Dr. Diane Pataki**

Dr. Pataki's lab is working on the environmental costs and benefits of urban landscaping in Orange and LA counties. Although most of individuals live and work in urban areas, urban ecosystems remain one of the most poorly studied biomes on earth. In part this is due to the complexity of these ecosystems, which involve interactions between decision-making, biophysical processes, and multiple disturbances to the environment including land use and land cover change, pollution, and alterations to climate. Dr. Pataki is investigating the influence of redistributing water from wildland ecosystems to urban ecosystems on local plant communities. Her goals are to better understand the role of plants and soils in urban ecosystems, quantify the services that vegetation provides to urban residents, improve projections of the effects of urbanization on regional and global biogeochemistry and climate, and inform urban planning.

5 Upper Newport Bay **Dr. Kailen Mooney**

Dr. Mooney is growing *Artemisia Californica* (Coastal Sage) in Newport Bay collected from populations from San Diego County to Marin County in a common garden where precipitation will be manipulated. These populations come from regions that vary 5 fold in annual precipitation. He is investigating whether populations of coastal sage are adapted to their local precipitation regime, and how much genetic diversity for drought tolerance there is within and among coastal sage populations. The results of this work will provide insight into how this plant, which is dominant component of increasingly rare coastal habitats, will respond to predicted climate change.

5 Newport Back Bay **Dr. Kathleen Treseder**

Dr. Treseder's work examines the role of fungi in mediating ecosystem responses to global change. Along with bacteria, fungi control several critical biogeochemical processes, including plant nutrient acquisition, decomposition of dead biomass, sequestration of nutrients in living and dead fungal tissue, and release of trace gases such as methyl halides. Laboratory studies have indicated that fungal growth and physiology can respond to atmospheric chemistry, nutrient availability, and soil temperature and moisture—all of which are altered by global change. As such, fungi may feed back to affect ecosystem functions under these conditions. Researchers have no clear idea of the specific fungal groups involved, nor do they understand their individual responses to the environment. By addressing each of these issues, researchers could advance the basic knowledge of nutrient dynamics as well as help predict ecosystem responses to global change.

6 Newport Coast, **Dr. Steven Allison, Adam Martiny** **& Sunny Jiang**

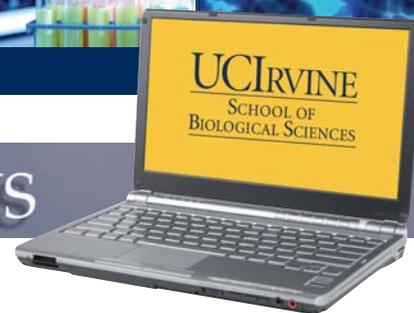
This team is currently working on ocean water quality in Newport Beach. They are monitoring how communities of bacteria, viruses, and plankton change over time, and they want to know if these changes can help predict water quality. In particular, they want to understand what causes toxic algal blooms and red tides, which have serious impacts on fishing, swimming, and aesthetic enjoyment in the Newport area. Altogether, this project aims to help managers improve the water quality of the ocean by understanding the microbes that live in it.

7 Crystal Cove Marine Research Station **Dr. Adam Martiny**

During the last two decades, it has become clear that microbes are present in practically all corners of the world - from the hot springs of Yellowstone to the deep subsurface of the ocean. DNA methods have uncovered unknown biodiversity and conservative estimates predicts that microorganisms constitute more than 50% of the total biomass on Earth. Due to their diversity and abundance, microbes are significant contributors to most nutrient cycles in the global ecosystem and play a key role in climate regulation. Due to their small size and large abundance, microbes can rapidly evolve and adapt to new conditions. The aim of the Martiny lab is to understand how bacteria evolve and adapt to changes in the environment. This can either be spatial differences in the oceans (i.e. how does bacteria evolve to compete in nitrogen vs. phosphate limited areas of the ocean?) or temporal where they may evolve as a result of global climate change. Most of the work in the lab focuses on bacteria living in the open ocean.



FACULTY IN THE NEWS



Adriana Briscoe

Associate Professor, Ecology & Evolutionary Biology, has been selected the 2008 recipient of the Federation of American Societies for Experimental Biology (FASEB) Diversity Award. The award, sponsored by the Burroughs Wellcome Fund, was established to recognize outstanding achievement by an early stage life scientist from an underrepresented minority group.

Susan Bryant

Vice Chancellor for Research, was recently honored by the American Association of University Women (Laguna Beach Chapter) for her outstanding efforts to advance women in science.

Peter Bryant

Professor, Developmental & Cell Biology, has created an exhibit, "Back Bay Benthics" that is currently on display at the Back Bay Science Center.

Michael Clegg

Professor, Ecology & Evolutionary Biology, was cited in an editorial on US-Cuban scientific relations in the October 17, 2008 online edition of Science Magazine. Restrictions on U.S.- Cuba scientific cooperation deprive both research communities of opportunities that could benefit both societies, as well as others in the hemisphere, particularly in the Caribbean.

David Fruman

Associate Professor, Molecular Biology & Biochemistry, along with Dr. Michael Lilly, was recently featured in the Journal of Clinical Investigation for their recent breakthroughs in the fight against leukemia. They found a new way to combat a subtype of acute lymphoblastic leukemia that could mitigate side effects and improve cure rates. The scientists found that a chemical compound called PI-103 inhibited both enzymes and killed mouse and human leukemia cells in laboratory experiments. Treatment of leukemia cells with an existing chemotherapy drug and PI-103 was more effective than either treatment alone. PI-103 and related drugs are in clinical trials for various cancers, but this study is the first to demonstrate a possible use in leukemia.

Charles Glabe

Professor, Molecular Biology & Biochemistry, authored one of a series of articles highlighting advances in Alzheimer's Disease research. The article in the October 2008 edition of the American Society for Biochemistry and Molecular Biology described the toxicity of amyloid peptide assemblies and proposes that conformationally sensitive antibodies might be the best means for classifying structural types of these oligomers, rather than size.

Thomas Lane

Professor, Molecular Biology & Biochemistry, has been named a Chancellor's Fellow, effective Sept. 1. The title honors scholars of exceptional value to the university whose recent achievements show extraordinary promise. With expertise in both virology and immunology, Dr. Lane's research interests include the identification of mechanisms underlying multiple sclerosis, demyelination and injury in the central nervous system following viral infection, which should lead to therapies for inflammatory disorders of the nervous system.

Tim Osborne

Professor, Molecular Biology & Biochemistry, has research findings featured in the October 9 online edition of the Journal of Clinical Investigation. Toxins in food often have a bad, bitter taste that makes people want to spit them out. His research finds that bitterness also slows the digestive process, keeping bad food in the stomach longer and increasing the chances that it will be expelled. This second line of defense in the gut against dietary toxins also triggers the production of a hormone that makes people feel full, presumably to keep them from eating more of the toxic food. This discovery has the potential to help scientists develop better therapies for ailments ranging from cancer to diabetes.

Diane Pataki

Associate Professor, Ecology & Evolutionary Biology, has been selected the 2008 James B. Macelwane Medalist of the American Geophysical Union. This medal is awarded for significant contributions to the geophysical sciences by a young scientist of outstanding ability.





STUDENT SPOTLIGHT

Student Highlight: **Bryan Bell**
Graduate Student,
Department Molecular Biology & Biochemistry

Bryan Bell is graduate student in the Department of Molecular Biology and Biochemistry, and recipient of the 2008 Schneiderman Award – a scholarship in honor of the former Dean for the School of Biological Sciences, Dr. Howard Schneiderman.

Bryan grew up intrigued by the medical field, and attended the University of Washington with the ambition of becoming a physician. He received a Howard Hughes Medical Institute (HHMI) Undergraduate Research Fellowship, which enabled him to pursue summer research in Medical Genetics. It was during this time that he became enamored with pure research, as the HHMI Fellowship allowed him to initiate and finish a full research project – a rarity as an undergraduate.



After Bryan graduated, he served as a lab technician at the University of Washington to evaluate whether he wanted to pursue a medical career or continue in research; he preferred research in the field of immunology, and applied to UCI, where he was heavily recruited.

Bryan currently works in the lab of Associate Professor Craig Walsh on an NIH Cancer Biology Training grant. Specifically, Bryan studies apoptosis (the disintegration of cells into membrane-bound particles), and the role of particular proteins in the survival and death of T-cells. Bryan is in his 5th year, and his next career step is to pursue Postdoc opportunities in Immunology at universities throughout the U.S.

Bryan lives with his wife and daughter Lilly (pictured) in Irvine, and in his rare spare time, enjoys road biking, rock climbing and backpacking.

External Relations Update

Continued from page 2

We are proud to announce that the biological sciences alumni community is helping these students through the development of several field-specific scholarships, or ‘prizes.’ Numerous biological sciences physicians, dentists, pharmacologists and optometrists have come forward to offer financial and personal support for these awards - both as individual donors, and through internship experiences in their respective practices.

Given the impact of the recent state budget cuts to the UC Irvine Regents’ Scholars program, the importance and timeliness for these competitive awards has been critical. We are very grateful to our alumni for their help in establishing these scholarships. As we look toward building these awards into endowments, we will continue to reach out to our alumni for mentoring, internships and financial support.

Our students represent the excellence and future of health care for the Orange County region - and beyond. Your support of their goals helps to inspire them, and provides incentive to continue the pursuit of increasingly challenging careers.

If you are interested in learning more about supporting a prize, please contact Jeanette Storey at 949-824-8030.





STUDENT SPOTLIGHT

Undergraduate Spotlight **Wesley Chin**

Wesley Chin is a Senior in the School of Biological Sciences, and a true example of how today's students get the most out of their experience at UCI.

Wesley is an Ecology and Evolutionary Biology major, and studied rainforest Conservation and Restoration Ecology under Dr. Lynn Carpenter (<http://www.dbc.uci.edu/~flcarpen/>). This research was conducted as part of a Bio 199 course, where Wesley also received an Undergraduate Research Opportunities (UROP) grant to explore insect diversity in the reforested lands of Costa Rica. His results were published in the UCI Journal of Undergraduate Research.

Wesley grew up in Poway, California, and became interested in science when his toy reindeer broke. During a routine visit to the doctor, both Wesley and his reindeer received care, which led to a long-term fascination with medicine. In high school, Wesley volunteered in rural Mexico through a local health services organization. It was through this experience that he observed the personal trust rural communities place in physicians, and the importance for doctors to listen to their patients and respective families. Wesley continued this type of 'experiential' learning by volunteering at Share Ourselves - a free clinic in Costa Mesa - and at UCI, where he has been active with the Flying Samaritans, a group that travels once a month to Mexico to administer healthcare.

When asked why he's pursuing medicine via coursework in Ecology and Evolutionary Biology, Wesley states that his work in conservation biology parallels the times in kindergarten when he was allowed to play with 'bugs and mud.' He felt college, was an ideal time to take advantage of his interests in nature and how things work, and UCI offered the opportunity to study different aspects of science while simultaneously exploring medicine through on-campus clubs such as 'IMed.' Wesley also pursued ecology coursework due to the mentorship and encouragement of faculty such as Dr.'s Carpenter and Katherine Suding, two faculty members who enjoy connecting students to ecology and evolutionary biology through activities such as hikes and local field research.

Wesley Chin was originally offered admission to UCLA, USC, Berkeley and Davis with Scholarships; however, he chose UCI specifically due to the Regents' Scholars program. In his personal time, Wesley is also a Big Brother to a seven-year old in Costa Mesa and plays tennis and intramural sports on-campus.

UPCOMING EVENTS

**Mentor Program
Kick-Off Reception**
November 12, 2008

**Mentor Program
Midpoint Reception**
February 11, 2009

Homecoming
February 28, 2009

**Schneiderman
Bioethics Lecture**
March 2, 2009

Bio Sci 3 Grand Opening Event
April 24, 2009

**Allergan Lectures in
Modern Biology**
May 6, 2009

**Mentor Program
End of the Year Reception**
May 13, 2009

Lauds & Laurels
May 14, 2009

**Graduate and Undergraduate
Honors Convocation**
June 2009

*For more information
on these events,
please contact
Alyssa Cruz at
949-824-4742.*

