Bio News

Spring 2008

A Newsletter for Alumni and Friends of the Department of Biology

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CONGRATULATIONS SPRING 2008 GRADUATES!

Dear Alumni and Friends:

The electricity is in the air again as we approach graduation time. We're expecting more than 200 undergraduate and 60 graduate students to celebrate Commencement this spring. Our second annual Baccalaureate and Masters Ceremony is slated for Sunday, May 25. Staff and student volunteers are planning a rousing ceremony followed by a sumptuous buffet. This year's program speaker is Dr. Elizabeth Blackburn, the UC San Francisco molecular biologist who has been an international leader in the study of telomeres—the ends of chromosomes that, thanks to Blackburn's work, are now understood to be crucial in cancer and in the biology of aging.

Associate Professor Gretchen LeBuhn has been on the media circuit, featured in national newspapers and Sunset magazine, telling folks about her Great Sunflower Project. Dr. LeBuhn will collect valuable scientific data on the health of pollinating bees—the first national study of its kind. Initially seeking to involve 10,000 citizen scientists of all ages who live in urban, suburban and rural environments across North America, LeBuhn now has over 20,000 community scientists from all 50 states and all the Canadian Provinces. Even if you don't have a degree in Botany or Entomology, join the crowd by signing up at http://www.greatsunflower.org.

Dan Maher, Mary Fermi and Ken Hitchner, all alumni leaders in the biotechnology industry, have organized an incredibly exciting symposium "Personalized Medicine—It Will Change Your Life" to be held June 5 at SF State's Jack Adams Hall. The symposium has already attracted an array of top-notch speakers from Genentech, DNA Direct, Monogram, Biomarin and 23andMe. Personalized medicine allows us to harness the power of genomics to predict what drugs will work best in a particular individual. It may well be to the 21st century pharmaceutical industry what aspirin was to the 20th. For more information, and to register, visit http://personalizedmedicine.sfsu.edu.

As you've no doubt heard, a very serious budget shortfall at the State level has caused an even more serious, bleak budget outlook for the California State University System. We in the Department are working to ensure that this temporary situation does not adversely affect students. Now more than ever we must be grounded in our mission of advancing global health and the biosphere through educating future generations of scientists, health professionals, teachers and citizens.

Warmest regards,

Mike Goldman

MEET THE STAFF

KIMBERLY TSUI — WORKING BEHIND THE SCENES

Kimberly Tsui, known as Kimmie around the Department, is both an SF State Biology alumni and the newest member of the Biology Instructional Services (BIS) Facility, located in HH 632.

Kimmie developed an interest in science while attending Hillsdale High School in San Mateo, but discovered that her interest came with a challenge. " I decided to go against my counselor's advice to enroll in a typing class," recalls Kimmie. "Instead I asked her to sign me up for Biology, Chemistry and Physics—all classes she felt were unnecessary for a girl."

From 2003-2005, Kimmie attended Skyline College where she also worked part time as a Lab Technician. "That experience was immeasurable," said Kimmie. "I was able to enhance my breadth of knowledge, and assist others in their quest for information. From then on working behind the scenes was something I knew I would enjoy doing."

After college, she worked for several hotels, beginning at the front desk to eventually becoming an Accounting Manager. During that time, she learned how to interact with all types of people, and to handle demanding situations.

"Working in the BIS Facility allows me to implement the hands on skills and techniques I learned as a Microbiology student to provide technical support, so our students can excel inside and outside the classroom."

In 2000, Kimmie was hired as a Finance Program Specialist for Agilent Technologies, and worked in their busy call center until the outsourcing of her position prompted Kimmie to enroll in SF State's B.S. in Microbiology because she liked the challenges involved with labs, and the "endless opportunities to learn within the field. Many microorganisms have not been discovered yet," said Kimmie, "simply because we can not culture them."

While a Biology student, she was impressed by how the BIS Facility staff and department faculty worked together as a team. "I knew then that the department would be wonderful place to work both for personal growth and professional advancement." So, in January 2007, after earning her degree, she submitted her resume, and was hired as an Instructional Support Technician.

When asked to describe a typical work day, Kimmie could not do so because "everyday is something new." The goal of the BIS Facility is to develop innovative lab experiments to nurture students' ingenuity. To that end, Kimmie, along with supervisor, Darleen Franklin, provide bacteriological media, chemical reagents, and laboratory supplies for upper division Biology courses. Kimmie often works in the teaching labs, and was a guest lecturer for BIOL 431, Medical Microbiology Laboratory, in Fall 2007.

Kimmie plans to eventually further her educational career by earning a Master's degree from SF State's Biomedical Laboratory Science or the new Genetic Counseling program. But, all that will have to wait because Kimmie's main focus now is on the upcoming birth of her first child in May 2008.

$1.3 Million NIH Award to Science Education Partnership & Assessment Lab

Dr. Kimberly Tanner, (SEPAL Director) administers a mentoring program: "Building Pathways to Biomedical Research Careers for Girls and Women of Color" designed to forge strong ties between local NIH-funded biomedical researchers and K-12 teachers and students.

Undergraduate Biology Student teams up with NASA

Stephanie Cunningham was selected to participate in Spaceward Bound Mojave 2008, a program designed for future science teachers to explore remote and extreme environments on Earth as an analog for human exploration of the Moon and Mars.

Photo by Gloria Nusse

Lecturer's work featured on CBS "48 hours"

Gloria Nusse's work on an unidentified remains case for the Alameda Sherriff's office was profiled on CBS "48 hours." ("The Girl Next Door," December 2007)

Extraordinary alumni

STEVE FERMI (M.A. Marine Biology, 1978)

Steve Fermi credits his SF State thesis advisor, Biology professor, Dr. Robert Beeman, with inspiring his love for research, and for saving his life!

"Dr. Beeman warned a group of us who liked to dive for abalone in kelp forests that if we ever got tangled in the giant kelp, it would be useless to try to free ourselves by pulling the kelp out by the plant's holdfast or 'roots' as these are necessarily strong in order to resist the force of the waves and surf," recalls Steve. "He said that the best way to free yourself was to grab the kelp with both hands, and bend it until it snaps like a dry twig."

It was fortunate that Steve was paying attention because ten years later, he found himself in 20 feet of water, but tangled in kelp about five feet below the surface. "My lungs were bursting after having held my breath for over a minute while I was searching for abalone. As I jerked my leg to try to break free, the kelp wrapped around it even tighter. Suddenly Dr. Beeman's advice came back to me. I bent the kelp, and was totally relieved to find that it did indeed snap like a dry twig. A few years later, I saw Dr. Beeman at a class reunion, and thanked him for saving my life."

Steve grew up in Indiana, and graduated (summa cum laude) with a B.A. in Biology from Ball State University. Partly because he had been a Jacques Cousteau fan as a child, and enjoyed water sports, he wanted to focus his graduate work on marine biology. He applied to SF State because he fell in love with the Bay Area when he and his wife, Mary, visited San Francisco on their honeymoon.

After earning his master's degree,

"The feeling of doing something that makes a difference in peoples' lives is personally rewarding."

Steve worked in a six-month temporary position for the California Department of Fish and Game studying rockfish, tuna and other fisheries in the Fort Bragg/Mendocino area. However, he soon came to believe that his prospects for a full time career as a marine biologist were limited as jobs were in short supply, and the pay scales were far from commensurate with his educational level. He looked for other research career opportunities, and found the career he is still in today — developing medical devices that have the potential to treat human diseases. Once laboratory or animal studies have demonstrated proof of concept, he directs clinical trials as a prelude to market approval.

"I often work on cutting edge technologies," Steve explains. "For example, I worked for Nellcor to develop and bring to market 'pulse oximetry' technology that allows doctors to see a patient's blood oxygen saturation in real time and non-invasively through a sensor that shines a light through the patient's fingertip." Today, pulse oximetry is routinely used in healthcare environments worldwide.

While an Executive Director of Clinical Affairs at Asthmatx, Steve worked on a device designed to help people suffering from asthma, a common and life threatening chronic condition in which the inside walls of the lungs' airways become inflamed and swollen, the muscles tighten, and air flow is restricted. The device, called Bronchial Thermoplasty, uses thermal energy to reduce the airways' ability to constrict, which may result in reducing the severity and frequency of asthma symptoms. Steve drafted the protocol for the company's pivotal study, and later heard from several participants whose lives had been transformed after undergoing the procedure. "One man had given up his love for cold water kayaking due to his worsening asthma. He was able to resume his passion after having participated in our clinical trial," said Steve. "Another asthma sufferer had never been able to participate in a centuries-old sporting contest in his local village in England. After having our procedure done, he was able to participate fully, and even sent us a picture of himself on the front page of his local newspaper with the winner's trophy hoisted over his head."

Steve earned a MBA from the University of California, Berkeley in 1990, and is currently Vice President of Clinical Affairs for BaroSense, Inc. in Redwood City, California. BaroSense focuses on the research and development of minimally invasive medical devices for the treatment of obesity—the largest global chronic disease in adults. Steve can be contacted at sfermi@barosense.com

IN MEMORY

FATHER OF THE LAB

DR. FELIPE-ANDRES RAMIREZ-WEBER

BY MARIA GINSBOURG
Undergraduate, Creative Writing Major

Felipe-Andres Ramirez-Weber died on November 1, 2007 after a 23-month battle with leukemia. He was 43 years old.

Born in Concepcion, Chile, Felipe-Andres was the only son of a priest, Father Ivan, and Elena Ramirez. He earned his B.S. (1986) in zoology at George Washington University, and a Ph.D. (1995) in molecular and cell biology at UC Berkeley. As a postdoctoral fellow at UCSF, (1995-2002) he worked with Dr. Thomas Kornberg who recalls that Dr. Ramirez-Weber's real forte was in using the microscope. This strength enabled him to discover a new cell structure which lead to their proposing a new theory on cell communication. ("Cytonemes: Cellular Processes that Project to the Principal Signaling Center in *Drosophila* Imaginal Discs" Cell, May 28, 1999)

In 2003, Dr. Ramirez-Weber joined the department as assistant professor. According to Dr. Wilfred Denetclaw, Dr. Ramirez-Weber was "the right person for the position. He was a geneticist, an outstanding scientist, a minority, and perfect for our research synergy."

Dr. Ramirez-Weber (often called FARW) taught for only two and a half years, but during that short time, he mentored over twenty students, designed a website: http://hedgehog.sfsu.edu, participated in countless committees, helped set up the Center for Computing in Life Sciences, and in the words of his former student Rosa Uribe, "gained the respect of everyone on campus."

Dr. Ramirez-Weber's passion for research inspired Rosa to pursue a career in science. She said that he taught her everything she knows about academic research, but admitted that he was not an easy teacher. "Sometimes I felt like he was throwing me into water without a life vest. It was often a stressful way to learn, but it was a very good way to learn because I learned a lot." Another student, Shiho Kawamura, remembers Dr. Ramirez-Weber as a "very strict teacher, but he was also considerate. If you had a problem, he would ask you to come to his office to talk. He was not judgmental. He was like the father of the lab."

"Even though he had a quiet demeanor, he was ferocious about science and determined that excellent science, stellar science could be done at SFSU."

- L. Marquez-Magana
Professor, Biology

Dr. Ramirez-Weber also inspired many of the faculty, including Dr. Leticia Marquez-Magana. When she thinks of him, she recalls a day he dropped by her office to talk. "He always looked like he was going to sit, and have a long conversation with you. You know, that was really rare in scientists of his caliber. That day, Felipe-Andres sat back in his chair, his legs crossed, his hands on his lap, making direct eye contact, and we talked about how we would change things at SFSU to make a stronger emphasis on quality research with quality student training."

Dr. Denetclaw said that Felipe-Andres was troubled that "we have this huge building, but we don't have the infrastructure to do first class research. So, he looked for ways to develop enough support to build a new science building that was strictly for research—all for the purpose of training our students to be top-notch scientists."

Biology professor Dr. Carmen Domingo recalls his desire to improve minority access to education. "What bothered him was that underrepresented minorities are not gaining access to the upper echelons of the educational community. Felipe-Andres wanted to make SFSU into a Harvard. And, he really felt that he could do that. And, I admired him for thinking that way."

Editor's Note: A scholarship to support minority undergraduate and graduate students majoring in Cell and Molecular Biology has been established in Dr. Ramirez-Weber's memory. Contributions can be made by check payable to "University Corporation at SFSU" (or "SFSU") with "in memory of FARW" (or "FARW") on the memo line. Mail to: FARW Scholarship, Department of Biology, San Francisco State University, 1600 Holloway Avenue, San Francisco, CA 94132-1722. To donate online, click on https://www.applyweb.com/ public/contribute?s=sfusceng, select "Biology" on the "I would like to support" drop down form, and type "FARW" in the comment box. The site will accept Visa or MasterCard. You should receive an immediate confirmation by email. Your generosity is greatly appreciated!

Lance Lund

Cultivating the Confidence to Learn Science

Lance Lund's love of teaching began at the College of San Mateo where a number of exceptional instructors encouraged him to teach others to develop a deeper understanding of nature, and their relationship to it.

As a UC Davis undergraduate (B.S. '97) majoring in genetics with an emphasis in human physiology, Lance worked in Dr. Neelima Sinha's lab researching the role of the T6 tomato plant homeobox (a DNA sequence involved with regulating development) genes in meristem and leaf development. (See Plant Physiology July 1998).

In 2000, Lance worked with terminal TB patients at the Mother Teresa House in Calcutta, taught basic microeconomics principles to school children in Siem Reap, Cambodia, and helped develop a fundraising plan for constructing a village schoolhouse near Bodhgaya.

After returning to the U.S., Lance considered development work, but learned that a master's degree was a minimum entry requirement, so he enrolled in SFSU's M.S. program in International Relations in 2003. That year he also joined the department, first as a graduate teaching assistant, then as a summer session lab instructor. He earned his M.A. in 2005, and signed on as a full-time Biology lecturer in Spring 2006.

Lance especially values his role in teaching Biology to non-science majors. His goal is to cultivate the confidence to learn science in his students, so they will apply biological concepts towards improving their physical health. In Human Biology (BIOL 100) and Human Biology Lab (BIOL 101), he focuses on health issues as they relate to the body including nutrition, infectious diseases, cancer, cardiovascular and reproductive disorders. To aid learning, Lance writes down everything that is important, repeats material in a conversational style, poses questions to the group, provides detailed study guides and practice exam questions, and always shows his enthusiasm for the subject. Lance also teaches Microbiology and Public Health (BIOL 211) and Human Physiology (BIOL 611) labs, and says that the pre health professionals he encounters inspire him "because they are all such noble young people driven to serve others."

"Our courses directly impact students, and will promote their well being for years to come."

His future plans include working with small, under-funded humanitarian relief organizations to enhance new and existing nutrition and clean water delivery services, and secondary school education in developing countries. And, of course, he will continue to teach. Lance can be contacted at llund@sfsu.edu

MEET A LECTURER

- **Cell and Molecular graduate student recognized as best student teacher**

Molly Klein-McDowell, student of Drs. Leticia Marquez-Magana and Kimberly Tanner, won the 2008 CSUPERB Crellin Pauling Student Teaching Award.

- **Cell and Molecular graduate student receives Biotech Industry Award**

Amy Sheldon, student of Dr. Zheng-Hui He, won a 2008 Genentech Scholars Award designed to facilitate student access to the biotech industry.

Photo by Jeremy Young
Natural History Museum, London

- **$1.2 million NSF award to three Romberg Tiburon Center researchers.**

Drs. Ed Carpenter, Tomoko Komada and Jonathon Stillman study how phytoplankton, *Emiliania huxleyi (left)*, may respond to the elevated rate of ocean acidification predicted for the end of this century.

Understanding Diversity in SFSU's Biology Department

by Raynelle Rino

The world of an underrepresented minority (URM) student in the sciences can be a lonely place. Language and cultural barriers between students and professors can have major influences on academic performance and retention at the university level. Amelia Rodelo, a native San Franciscan of Mexican and Native American heritage, is an undergraduate researching marine ecology at the Romberg Tiburon Center. She explains, "In the beginning, it was the feeling of being out of place where the environment is very different. None of it is intentional, but it makes you feel uncomfortable. Many people can't get used to it, and that determines if you will make it through, and how much culture plays a role in that."

To gain some insight on how the issue of diversity is being addressed in the Biology Department, I spoke with several Biology faculty, staff and students. Most agreed that hiring more faculty of color, and putting efforts into URM student outreach seem to be important steps in making this feeling of alienation a less common occurrence.

The feeling of inclusion is important for URM students to succeed, and go to graduate school. Building a community of researchers for their expertise is essential in research, but advisors or committee members for minority students are usually not faculty of color, and may lack the understanding of cultural discrepancies. Latino graduate student Pedro Morgado shares his perspective, "It may be hard for a student to bring up issues a non-minority advisor has never experienced. Minority students may have a difficult time bringing up issues that a student of the majority may not have to deal with. For example, the money that I have made, a portion of that money has gone to my family." Supporting himself and his siblings is a cultural sacrifice Pedro is willing to make, but may not be empathized by scientists in academia.

Raynelle Rino is a Filipino-American Ecology and Systematic Biology graduate student whose future goals include a career in science writing. Her academic experiences motivated her to write about the topic of diversity.

"Language and cultural barriers between students and professors can have major influences on academic performance and retention at the university level."

The good news is that SFSU is home to a very diverse environment with ~36% of its students comprised of URM groups. (Rath et. al., 2007) Some students and faculty agree that it is the diversity of the campus that draws them here. Students in the subdisciplines of cell biology and health professions are more diverse, and may not have trouble finding similar cultural communities. These careers are familiar and ensure a sense of financial security.

The bad news is that students pursuing ecology careers may not have much support culturally. To remedy this, the department has recently hired two women, Dr. Karen Crow-Sanchez, and Dr. Bettina Engelbrecht. These women serve as role models for future minorities and women.

Department faculty also participate in student outreach programs that give financial support and guidance for URM success in the sciences. Through the National Institute of Health, Dr. Megumi Fuse works with the Bridges program which helps URM students at City College of San Francisco pursue Bachelor degrees in biomedical research at SFSU.

I believe that not only must we work towards diversification of cultures, we must also open ourselves up to the diversification of new ways of thinking and teaching. According to Dr. Fuse, "There is not enough academic support for diversity, but there is some help there. It's easy for struggling students to get lost in the cracks, and a student on probation should *have* someone who they have to see. And, we need to apply other teaching strategies to take into consideration the different types of students on campus—like those who may be more shy or timid."

Diversification serves as a major advancement of the discipline by promoting collaboration and different approaches to problem solving. "People have to work with each other to deal with global problems," said Department Co-Chair, Dr. Carmen Domingo. "In research, people come with different interests and social experiences that make them look through different lenses."

The advancement of science through increasing diversity continues at SFSU, and will serve to resonate to other less diverse institutions as our students further their careers. It is a win-win situation when both participants and the field of scientific research and education advance.

Reference: Rath, K.A., et. al. 2007. Supplemental Instruction in Introductory Biology 1: Enhancing the Performance and Retention of Underrepresented Minority Students. CBE-Life Sciences Education. Vol. 6. p. 203-216.

A remarkable student

ROBERTO BARROZO BY RAYNELLE RINO

Rob Barrozo and Dr. Steve Weinstein

Roberto Barrozo's journey through academia has been arduous, yet rewarding. Rob, the eldest of eight children, began his academic career at Skyline College majoring in Applied Health. He then transferred to SF State to complete a B.S. in Cell and Molecular Biology in 2004. He currently works with Dr. Steve Weinstein, and is at the tail end of obtaining his Master's degree in Cell and Molecular Biology.

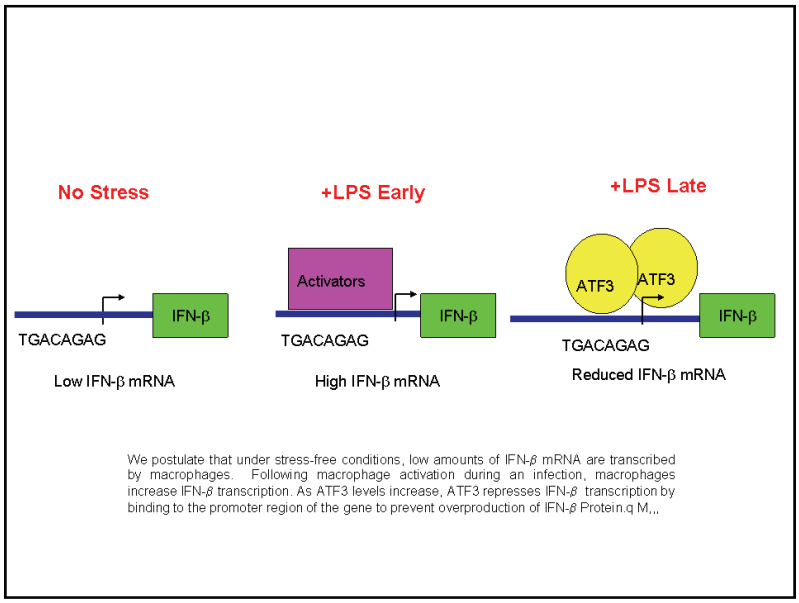
Rob's motivation for immunology research came from a toxicology lab internship at the University of Montana. In Dr. Weinstein's transcription lab, located in HH 670, Rob studies the molecular mechanisms that regulate inflammation. Specifically, he is investigating the role of ATF3 (Activating Transcription Factor 3), a protein that represses the expression of IFN-β (interferon beta) genes. These genes are always present in low levels in the body, but spike up under stressful conditions such as when the body needs defending against infection. ATF3 must come in, and repress the process of IFN-β expression because too much of an increase can lead to autoimmune diseases. The role of ATF3 as a repressor is known, but not well understood, and Rob hopes to contribute a better understanding of ATF3 through his thesis work.

As an NSF-GK12 fellow, Rob has presented his research and poster (right) at major conferences including SACNAS (Society for the Advancement of Chicanos and Native Americans), and ABRCMS (Annual Biomedical Research Conference for Minority Students).

From his graduate school experience, Rob has learned the importance of time management, critical thinking, and the benefits of collaborative research. He says that his experience has been amazing especially considering he met his fiancé while taking a BIOL 402 microbiology lab.

"SFSU has definitely been a nurturing environment, always providing me with the support I could not have received anywhere else."

Rob graduates this summer, and plans to pursue a Ph.D. in immunology at UC Davis. His ultimate goal is to remain in academia as either a university professor or researcher. Rob can be reached at rbarrozo@sfsu.edu



We postulate that under stress-free conditions, low amounts of IFN-β mRNA are transcribed by macrophages. Following macrophage activation during an infection, macrophages increase IFN-β transcription. As ATF3 levels increase, ATF3 represses IFN-β transcription by binding to the promoter region of the gene to prevent overproduction of IFN-β Protein.q M,,,

PHILANTHROPY AT SF STATE'S DEPARTMENT OF BIOLOGY

Conservation Genetics Laboratory **Scholarly travel** Science Education Partnership & Assessment Lab

Laboratory Equipment Guest lecturers **Cell and Molecular Imaging Center**

Scholarships for students in need **Graduate student fellowships** New faculty start-up

Field trips Alumni newsletters **Mycology collection**

Faculty and student research **Merit-based scholarships** Herbarium collection

Baccalaureate and Masters Ceremony IT infrastructure upgrades

Colloquium Upgrade and name a lab, office or conference room **Name the new Greenhouse**

The Department of Biology extends a heartfelt thank you for your generous contributions.

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A Newsletter for Alumni and Friends of San Francisco State University's Department of Biology

Our mission is to engage the talents and resources of alumni, students, faculty, staff and friends in the life, work and goals of the Department of Biology. We know that you are community focused on making a difference in the world. We want to hear about your achievements, read your letters to the Editor, see your photos, cartoons, crossword puzzles, and science-related book recommendations.

Submission Guidelines: We welcome articles that cover Department people, programs, activities and research. Articles can vary in length between 50-600 words. Please provide captions when submitting photographs and images. Send to bionews@sfsu.edu

Want to receive current Department, College and University news including events, seminars, workshops, course, scholarship, grant, research, employment and internship opportunities? Email silver@sfsu.edu to receive (or post announcements in) the weekly electronic "Bio Bulletin."

Advancing Global Health and the Biosphere
Educating Future Generations of
Scientists, Health Professionals, Teachers and Citizens