



BioNews

Fall 2017 Issue 23

Greetings friends!

As many of you know, I took over the reins of the Biology Department at the start of the semester. Although my first couple of months on the job have been quite a whirlwind, the new view from the chair's office has given me the opportunity to reflect on the remarkable department that I inherited from Dr. Michael Goldman.

Like many of my colleagues, I chose to be here at SF State because of the amazing students, faculty and staff I met during my interview. Today, I want to take this opportunity to brag about our amazing student-scholars. First off, our students are hands down the most resilient people that I have ever had the opportunity to know. As a long time instructor in a very large introductory course, I got a close up view of the many challenges that our students face. One of the realities of living in the Bay Area is that it is an exceedingly difficult place to make ends meet. Some of our students are struggling with homelessness and food insecurity while others are navigating illnesses and deaths in the family, domestic abuse, and deportation of their friends and families.

Despite this, our students are pushing back the frontiers of science every day. In the last 6 months, undergraduate and graduate students have co-authored publications about their research. They have also presented their work at national and international conferences and have earned well-deserved awards and fellowships.



Our students have a profound understanding of hardship, which remarkably, fosters an incredible desire to give back to their communities. On top of everything else they are doing, our students find the time to reach out to pre-K kids and elementary school kids, prepare and serve meals at Glide Memorial Church, and collect/distribute supplies for people affected by the recent North Bay Fires (*photo left*). I am inspired by the goodwill of these students, who have so little material wealth; they give me great hope in these very uncertain times. I am enormously grateful and proud.

One of our fund-raising goals for this year is to raise money to help students like Gabriela Ponce, who is featured in this issue (*page 8*), to become successful scientists and leaders. We hope that you will support us in that cause.

Dr. Laura Burrus, Department of Biology Chair

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Dr. Jason Cantley joined the Biology faculty this fall as an Assistant Professor in Plant Evolutionary Biology. Before coming to SF State he earned a Ph.D. in Botany from the University of Hawaii at Manoa and was a Burpee Post-doctoral Fellow of Plant Genetics at Bucknell University. In 2016, Dr. Cantley received the Botanical Society of America's Margaret Menzel Award for

best genetics paper "Monolithic sandstone continental islands unlock secrets of breeding system evolution in sympatrically occurring taxa of the Australian spiny *Solanum* lineage."

Dr. Cantley describes himself as a 'question-driven evolutionary botanist investigating patterns of evolution and its correlation to diversity.' He utilizes molecular phylogenetic techniques and bioinformatics to understand unique evolutionary histories for various taxonomic lineages including the factors that led to the loss or development of biodiversity. At SF State he plans to create a plant evolution focused laboratory to study California's exceptionally diverse floristic province with a focus on the interface of changing climate and biodiversity plus conservation.

"I envision projects and field research that would take place locally in California where I would develop long-term ecological and evolutionary projects."

When asked about his teaching style, Dr. Cantley replied, "the use of logical thinking as a tool to understand the workings of the natural world speaks to the ethos of my teaching style. As a teacher, I aim to equip my students with the analytical tools necessary to be successful in science, including the ability to utilize logical thinking skills to approach and solve situations that arise outside of the traditional classroom setting."

In his essay "Working My Way Out" published in *Science* Dr. Cantley wrote about his personal struggles as a LGBTQ scientist which have shaped his personal commitment as a teacher, mentor and role model who promotes human diversity in all fields of science. "Even though I know it will always be challenging to be a self-identified LGBTQ scientist, the visibility I can provide to students can — and has — positively influenced their choice to continue pursuing a career in science."

For more information about Dr. Cantley, visit: <http://biology.sfsu.edu/people/jason-cantley> or email: cantley@sfsu.edu

NEWS



Dr. Kimberly Tanner received the American

Society for Cell Biology's 2017 Bruce Alberts Award for Excellence in Science Education for her innovative contributions to science education. Dr. Tanner directs Biology's Science Education Partnership and Assessment Laboratory (SEPAL) which studies how science is taught and learned in classrooms. Her work focuses on creating positive experiences for students in science classrooms and increasing the diversity of students studying the sciences.



Graduate Physiology major and alumna **Amanda Carbajal** (BS Zoology 2016)

received a Women in Science & Engineering Scholarship (WISE) for her research focused on behavior-based neuroactive drug discovery to improve the quality of medications to treat and manage mental illnesses and neurological disease.

To learn more about past WISE Scholarship recipients, <http://cose.sfsu.edu/wise/scholarship>



**NEW COLLEGE OF
SCIENCE & ENGINEERING
INTERIM DEAN:
DR. CARMEN DOMINGO**

Dr. Carmen Domingo was appointed Interim Dean of the College of Science & Engineering in August.

Dr. Domingo joined the Biology faculty in 1997 after earning a Ph.D. in Molecular and Cell Biology from the University of California, Berkeley. She was soon recognized as an accomplished teacher, mentor and researcher focused on the cellular and molecular pathways that underlie pattern formation in the vertebrate embryo.

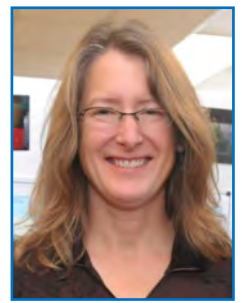
Dr. Domingo also co-founded numerous specialized graduate and undergraduate programs including the PSM-STEM Science program, SF BUILD Student Training Program, CIRM-Bridges Training Program and most recently, PINC —an undergraduate student program designed to promote inclusivity in Computer Science.



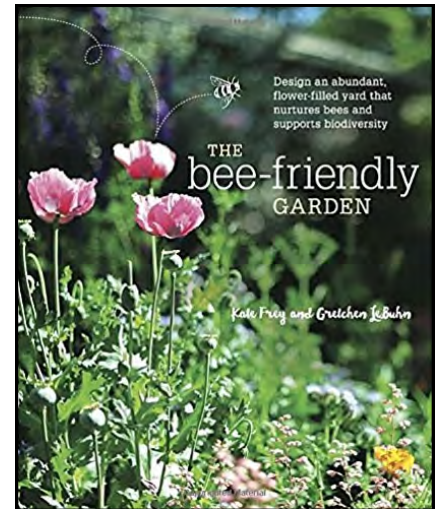
“I look forward to working with faculty across scientific disciplines to provide students with the best training opportunities that will prepare them for demands of the STEM workforce. We have amazing faculty that are changing the way we do science and the way we teach science. Our students are hard

working, smart, curious, and compassionate. Their determination to achieve great things inspires me to work hard on their behalf. An important goal as Interim Dean is to bring resources and opportunities to our faculty, staff and students so that they can continue to make significant contributions to the fields of science, technology, and health.” — Dr. Carmen Domingo

Dr. Gretchen LeBuhn’s newest book *The Bee-Friendly Garden* was selected by the American Horticultural



Society (AHS) as one of five recipients for the 2017 AHS Book Award. In her book, she debunks myths about bees, explains seasonal flower progression, provides regional plant and plants-to-avoid lists along with detailed instructions for nesting boxes and water features.



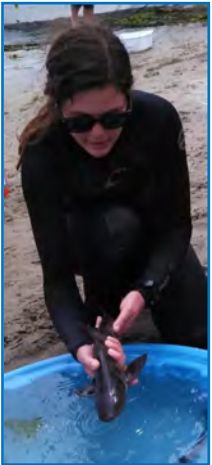
Dr. LeBuhn is also the author/editor of two other books on pollinators: *Field Guide to Common Bees of California* and *Attracting Native Pollinators*. She is the founder and director of The Great Sunflower Project, a national citizen science program designed to gather information about bee diversity and activity.

Dr. LeBuhn is currently doing research on the bees of Mt. Tamalpais and meadow birds of the Sierra funded through the Marin Municipal Water District, Golden Gate Conservancy, Marin County Parks, The Nature Conservancy and the US Forest Service.

THE FishLab



Associate Professor and Biology alumna **Karen Crow** (MS Marine Biology 1995) is the PI of “FishLab.” Her research is focused on understanding the genetic basis of body plan remodeling in fishes. Her interests include Hox genes, which are present in all animals, and the role they play in specifying regions of the body plan during embryonic development. She studies how changes in protein coding and regulatory sequences of Hox genes are associated with morphological evolution.



Recent work in FishLab has revealed insights on how the typical shark body plan was morphed into the dorso-ventrally compressed body plan of skates and rays. Graduate student **Shannon Barry** (photo left) discovered distinct roles for two Hox genes that are involved in the anterior expansion of paired fins as part of a genetic regulatory network underlying domains for distal elongation and outgrowth. These same genes that help reshape the anterior region of pectoral and pelvic fins are also implicated in the evolution and development of claspers — reproductive organs located in the posterior region of the pelvic fins of male sharks, skates, and rays. This is an example of how ‘toolkit’ or master regulatory genes that control developmental processes common to all vertebrates can be expressed in different places, times, and contexts to produce a variety of fin shapes and sizes. Shannon is the first author of a manuscript on this research which will be published in the journal *EvoDevo*.

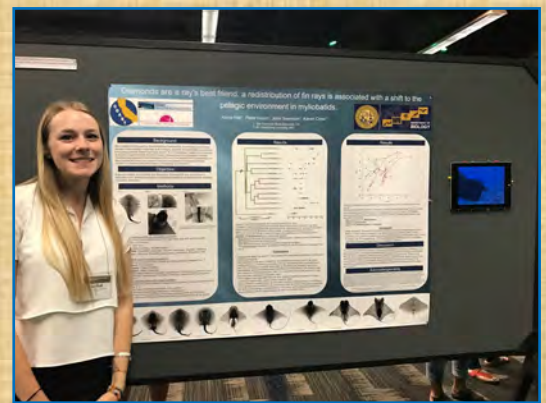


“The pectoral fin in skates and rays first expands anteriorly, and then zips up to fuse to the head at a later stage of development,” said Dr. Crow. “In the manta rays and their relatives, the pattern of the zip up is modified somewhat resulting in the cephalic (head) lobes that make them so unique.” Graduate student **John Swenson** found that cephalic lobes are modifications of the anterior pectoral fins of skates and rays based on shared expression patterns of several genes in the Hox pathway, but with slight modifications in the expression of other genes that are likely associated with the novel aspects of cephalic lobes.

FishLab researchers also study the reproductive strategies of surfperches — a group of fishes that are common off the California coast and which give birth to relatively small broods of live young. “Surperches have one of the most derived reproductive systems of all vertebrates,” said Dr. Crow, “because the young are nearly sexually mature when they are born, so they essentially give birth to teenagers.”



*FishLab graduate student **John Swenson** (center) presented a poster on ‘How the devil ray got its horns’ featuring cephalic lobe development of cownose rays at the Joint Meeting of Ichthyologists and Herpetologists in Austin, TX where he won Best Student Poster.*



*FishLab undergraduate student **Kayla Hall** presented a poster on pectoral fin remodeling in manta rays and their relatives at the Joint Meeting of Ichthyologists and Herpetologists. She is lead author of a manuscript on this work which has been submitted to the *Journal of Morphology*.*

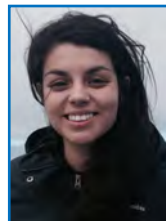


*FishLab graduate student **Michael Izumiyama** received a National Science Foundation grant to conduct research on reproductive strategies of surfperches, including the selective advantages of multiple paternity, at Osaka City University (Japan).*

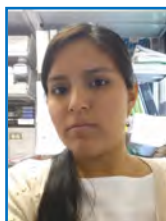
To learn more about Biology’s FishLab visit:
online.sfsu.edu/fishlab/FishLab/Welcome.html



SABINA BERA (MS Physiology 2010) is a MD in Psychiatry. She was awarded the American Psychiatric Association's Jeanne Spurlock Congressional Fellowship which provides support for early career psychiatrists with an interest in child and/or minority mental health advocacy to work in a congressional office.



ALMA CEJA (MS Marine Science 2017) is a Ph.D. candidate in UC Riverside's Geological Sciences Department where she is conducting astrobiology research funded by a Dean's Distinguished Fellowship.



BETSABEL CHICANA (MS Cell & Molecular Biology 2017) is a Ph.D. candidate in the Quantitative and Systems Biology program at UC Merced.



MOLLY KLEIN-MCDOWELL (M.S. Cell & Molecular Biology 2008) earned a MBA from the University of Michigan, Ross School of Business. She is working for Roche in the Philippines bringing novel cancer therapies to that country.



ALEXANDRA LAWRENCE (MS Ecology, Evolution & Conservation Biology 2017) is a Ph.D. candidate in Biogeography at the University of Bayreuth (Germany) where she is working on a EU-financed ECOPotential project that addresses long-term and large-scale environmental and ecological challenges.



WILLIAM VIDAVER (B.A. Biology 1958) passed away in August at the age of 96. Bill earned a Ph.D. in Biological Sciences from Stanford University then joined the Simon Fraser University faculty in 1965 where he researched photosynthesis and plant physiology. He authored and co-authored over 80 publications.



MICHAEL GOLDEN

**BS Botany 1989;
MA Ecology &
Systematic Biology 1992**

Michael Golden received the Distinguished Faculty Award from Grossmont College in El Cajon, CA.

In 1993 Michael joined Grossmont College's Biology Department, and took the campus by storm, putting his heart and soul into being an amazing, dynamic, and inclusive member of the San Diego community and the community at Grossmont College.

As a biology professor, ecologist, botanist, and activist, Michael led the way in bringing Grossmont into the 21st century by offering the first online course. He mentors students through the San Diego/Imperial County Community College Association and the Bridges Program. He participated in building a school in Chiapas, Mexico, and helped in building a greenhouse and planting native plants throughout the Grossmont campus ensuring that each plant was labeled both in Latin and in Kumeyaay — the language of the Native Americans of southern San Diego and Imperial counties.

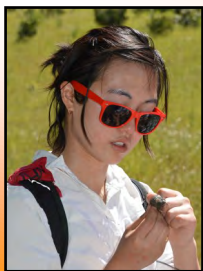
Michael has been an unstoppable force through the American Federation of Teachers and as a union member in protecting faculty and staff. He supports and advocates for people of color on campus, standing up to protect diversity and cultural studies on campus. He is a vocal advocate in support of undocumented students, and works hard to provide scholarships for DREAMers and AB 540 students. He donated his \$500 Distinguished Faculty Award as a scholarship for AB 540 students and has encouraged faculty and staff to set up a small monthly donation to continue support and protection for these students.

In his acceptance speech Michael talked about how humans migrate more than any other species. He pointed out that "we migrate from place to place in order to seek safety, shelter, family, and opportunity." As our government attempts to eradicate this natural phenomenon, it is men and women like Michael who do the work to continue to protect and support students and their families.

— Submitted by Carmela Golden

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JESSICA KWAN

MS Physiology and Behavioral Biology 2017

"I became interested in wildlife rehabilitation because of field work I did in Dr. Andrea Swei's lab (www.sweilab.com/index.html) which gave me an opportunity to interact with wild animals. I am currently interning at three different wildlife rehabilitation centers in the Bay Area: the Peninsula Humane Society (Burlingame), Lindsay Wildlife Hospital (Walnut Creek), and WildCare Solutions (San Rafael) that treat injured and/or sick animals brought in by the public and, if possible, rehabilitate them for release. The common theme of why injured wildlife come in is because of human impact. Whether it is cutting down a tree so a baby bird nest falls down or letting your cat roam outside, giving it an opportunity to catch a baby squirrel, without us, these injuries would not have occurred.

Being at a wildlife center has its perks with regards to continuing my research. Beyond animal husbandry and assisting with medical treatment, I can collect ticks from a variety of wildlife, ranging from songbirds to raptors, opossums to raccoons, and even the occasional Western fence lizard to study how blood meal affects the tick microbiome. Ticks are ectoparasites (parasites that live outside of a host) that you find on a lot of injured/sick animals that are brought into wildlife centers, and are usually a good indicator that an animal has been on the ground for a while.

At SF State, my master's thesis work looked at the tick microbiome and the environmental effects that alter it, including life stage, host blood meal, and Lyme disease infection status. My field work consisted of dragging for ticks in the field and collecting feeding ticks off of Western fence lizards. I took engorged larvae into the lab and allowed them to molt (grow) to the next life stage as nymphs. Ticks only feed once every life stage and this can help us isolate what they have fed on and more easily compare differences in microbiome composition.

With my background in disease ecology and interest in wildlife rehabilitation, I hope to become a veterinarian with a focus on both wildlife medicine and research. I have also considered teaching thanks to my time as a Biology Graduate Teaching Assistant at SF State and the wonderful students I taught.

Thank you Dr. Swei for being the best professor any grad student could work with!"

HOPE LANCERO (BS Cell & Molecular Biology 1995) worked for six years as a Life Science Research Professional at Stanford University. Her research was published in numerous scientific publications, including the Journal of Immunology. Below is her memory of Biology Professor **Janis Kuby** (photo right).

"Sometimes in life when you meet people, you have no idea of the impact they will have on you. Dr. Janis Kuby is one of those special individuals that stand out in my mind.

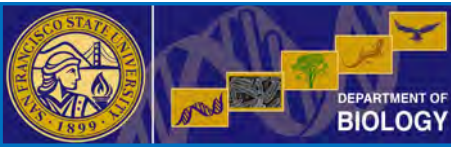


I still remember the day I was taking notes in her Immunology class. It was a difficult class. After doing miserably on the first quiz of the semester, I was sure failing the course was inevitable. But Dr. Kuby believed in me. As I was leaving the class one day, she called me over. My imagination went wild on why she was calling me over. However, she put my self doubt at ease as she went over every question on the quiz with me. Eventually she encouraged me to take another quiz. Although unsure of my abilities, I tried again. To my surprise, I actually did incredibly well. Although I was excited and she was happy, Dr. Kuby wasn't surprised. She believed I would be able to do it all along. Afterwards, she made sure I knew that she was available if I had questions, but I didn't want to bother her since she was in the middle of writing her Immunology textbook (Kuby Immunology).

After I had graduated, I worked at a basic science lab at UCSF. After a couple of years, I decided to apply for graduate school. By this time the textbook that Dr. Kuby had been working on had been published and was being used in universities across the country. I needed a letter of recommendation and Dr. Kuby was the first person who came to mind. I wanted to talk to her about my pursuit of graduate studies as well as have her sign my copy of her immunology textbook. When I called her office her secretary informed me that she had passed away after years of battling cancer. I was in shock. I knew she had cancer, but I thought she was in remission.

I always regretted not thanking her for her inspiration and encouragement. Without her unending faith in me during that immunology course, I would never have followed my ambition to pursue my doctorate degree.

Sometimes in life, you meet people who make an impact. This impact can change the course of someone's life. That's what Dr. Kuby did for me. Every time I make a donation to SFSU, I make sure to donate either to the memory of Dr. Kuby or to the Janis Kuby Memorial Scholarship Fund in the hopes that one day I can do for someone else what my professor did for me."



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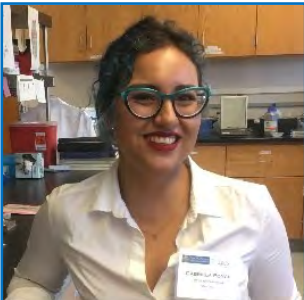
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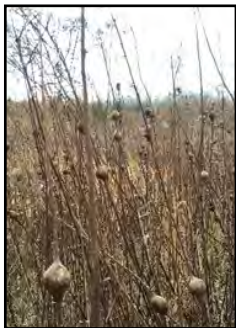
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CHANGE A LIFE BY SUPPORTING SF STATE'S DEPARTMENT OF BIOLOGY



"My name is **Gabriela Elena Ponce**. I am a bilingual/bicultural Mexican American graduate student in SF State's Ecology, Evolution and Conservation Biology program. My study interests lie in the realm of insect-plant interactions. I am currently studying the development of insect induced

tumor-like growths called galls. My work uses fluorescent antibody staining techniques to localize plant hormones within insects that they use to induce galls. The support I have received has allowed me the opportunity to focus on my research rather than having to work multiple jobs to reach my education and research goals."



Galls (left) and Gabriela (right) dissects larvae of the Goldenrod Gall Fly (*E. solidganis*)

JOIN alumni, friends and colleagues in supporting students like Gabriela by giving generously to the SF State **Biology Faculty Scholarship Fund for Students**. Your donation will directly support students recognized for exceptional abilities, achievements and financial need. This fund allows faculty the flexibility to award any student, regardless of citizenship or grade level with scholarships to ensure the success of the next generation of scientists.

Learn more about supporting the Department of Biology by contacting SF State's Development Office:

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