

BioNews

Spring 2016 Issue 20

A Letter to Alumni and Friends from Dr. Michael Goldman, Department Chair

Congratulations to our Class of 2016!

I recently had a rare chance to reflect more broadly than usual on the genesis of our discipline as I reviewed a copy of Siddhartha Mukherjee's sweeping history of genetics, *The Gene*. The history of biology seems rife with examples of groundbreaking discoveries that were somehow ignored for decades. Such was the fate of Mendel, Darwin, and the first scientists who realized the central role of DNA as the genetic material. I wondered about what it takes to recognize revolutionary transformative research and whether I would have been one of the observers who missed the point, and if I'd recognize revolutionary work today. I wonder if our model for funding research through the National Science Foundation and the National Institutes of Health is really conducive to the most innovative work. Fostering such work is what we try to do here at SF State every day. This year, we highlight some of the latest developments in our annual conference, Personalized Medicine 9.0: Gene Therapy and Genome Editing — *This changes everything!*

I was also impressed by the deep history biology has as an interdisciplinary field. Physicists who fled war-torn Europe crossed paths with biologists here in the United States. Out of their work blossomed the dynamic field of molecular biology. Today, one might argue that computer science is the discipline that contributes extraordinary new insights in biology. With this in mind, two of our professors, Drs. Carmen Domingo and Pleuni Pennings, are launching a new program to encourage biology students to pursue a certificate tailored to coding and computational skills that will prepare them to be among the most competitive in the field. This is an example of the efforts of just two of the many professors, lecturers and staff that are working tirelessly to make SF State's Department of Biology one of the most innovative in the country.

In April, more than 200 potential students visited us in Hensill Hall during our annual "Sneak Preview" day. Current students and professors were on hand to answer questions and show their work in teaching and research laboratories. For the first time we hosted our annual "Open House" event during that weekend inviting alumni back to campus to share their post-college experiences with the new generation of students. Our "Open House" event takes place every year, and we look forward to seeing more of our alumni in upcoming years.

In this issue of *BioNews* we highlight our newest faculty member, and the exciting cutting edge research that makes our department unique; with our commitment to the University's core values of Courage, Life of Mind, Equity, Community and Resilience combined with excellence in research and teaching.

Join our efforts now! Send us your news and your continued support today!



DEPARTMENT OF BIOLOGY

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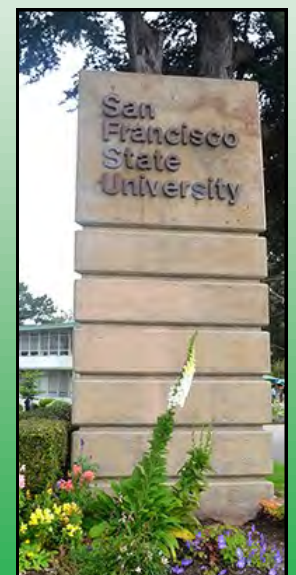
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Photo by Justin Chan

JANUARY

Undergraduate student **Bridget Hansen** received a Howard Hughes Medical Institute Exceptional Research Opportunities Program award.

Drs. Kimberly Tanner and **Shannon Seidel's** article "What if Students Revolt? Considering Student Resistance: Origins, Options and Opportunities for Investigation" was on the *Faculty Focus* "Best of" list.

FEBRUARY

Graduate student **Calvin Lee** received the Walter Carr Award for "X-Cell Tumors in Juvenile English Sole (*Parophrys vetulus*) and Immunogenetic Variation."

Graduate student **Joseph Oloo** received a Great Lakes National Scholarship for his research on treating metaplastic breast cancer.

The **Dr. Blake Riggs Lab** authored "Spatial Reorganization of the Endoplasmic Reticulum during Mitosis Relies on Mitotic Kinase Cyclin A in the Early *Drosophila* Embryo" published in *PLOS ONE*

Graduate student **Jonathan Young's** work on a Presidio lake was featured in a *Bay Nature* magazine article "From the Bottom Up at Mountain Lake."

MARCH

Drs. William Cochlan
 (photo right)
 and **Wim**



Kimmerer's
 Labs

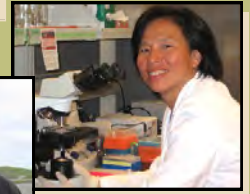
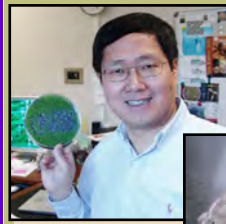
produced a KQED video "From Drifter to Dynamo: The Story of Plankton."

Graduate student **Ellen Young** won the SF State-level (in Education)/CSU Research Competition for "Student Talk in Active Learning Biology Classrooms."

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Department of Biology



**Alumni
 and friends
 like you
 help us to
 continue our
 long-standing
 tradition of
 educating
 generations
 of scientists,
 health professionals,
 teachers and
 citizens.
 Thank you!**

Undergraduate student **Torey Jacques** won the SF State-level (in Biological and Agriculture Sciences)/CSU Research Competition for “Epothilone B and Paclitaxel Display a Synthetic Lethal Interaction with SAC Comprised Cells in the *Drosophila melanogaster* Compound Eye.”

Graduate student **Jessica Kwan** won the SF State-level (in Biological and Agricultural Sciences)/ CSU Research Competition for “Comparison of *Ixodes pacificus* Tick Life Stages and Their Microbiome Diversity in Relation to *Borrelia burgdorferi* Infection.”

Dr. Pleuni Pennings’ paper “Loss and Recovery of Genetic Diversity in Adapting Populations of HIV” received Honorable Mention from the International Society for Evolution, Medicine and Public Health’s best 2015 articles on evolution in the context of medicine and public health.

Dr. Vance Vredenburg co-authored “A Century of *Batrachochytrium dendrobatidis* in Illinois Amphibians” published in *Biological Conservation* and “Early 1900s Detection of *Batrachochytrium dendrobatidis* in Korean Amphibians” published in *PLOS ONE*.

APRIL

Graduate student **Calvin Lee** received a Myers Trust Award for his work on the immunogenetics of English Sole and the relationship between parasites and contaminants.

Dr. Andy Zink authored “Kin Selection and the Evolution of Mutualisms between Species” published in *Ethology*.

Biology hosted ‘Friends of Biology’ event with Alexion Pharmaceuticals Inc. V.P. **Judith Sernatinger** (MA Cell & Molecular Biology 1987).



INTRODUCING DR. FELIPE ZAPATA

Dr. Felipe Zapata joined the faculty as an Assistant Professor of Plant Evolutionary Biology in January. Before coming to SF State, Dr. Zapata completed his Ph.D. in Ecology, Evolution and Systematics at the University of Missouri–St. Louis and the Missouri Botanical Garden where he investigated the role of geography and ecology in the diversification of South American montane plants. From there, he moved to UC Berkeley and then Brown University as a postdoctoral researcher. He has authored and co-authored numerous publications, and received the prestigious 2013 Publisher’s Award for Excellence in Systematics Research from the Society of Systematic Biologists.

Dr. Zapata’s research is focused on understanding how biodiversity has originated and evolved. This took him to South America because as he explains “the forests of this continent are the most species-rich terrestrial ecosystems in the world.” He has also collaborated in projects studying the evolutionary radiations of large groups, including those of Gastropods (snails and relatives) and Cnidaria (jellyfish and relatives). In his research, he combines traditional natural history and morphometric approaches with novel genomic analyses to discover biodiversity and infer the evolutionary history of organisms.

In Dr. Zapata’s classroom and lab, students take an active role in research projects. “I encourage their participation throughout the scientific process from brainstorming ideas, to carrying out fieldwork, troubleshooting protocols, writing computer code, to presenting their research to other colleagues, to writing, and the submission and peer-review process. As a teacher, my goal is to help students begin to think independently and critically like scientists and discover knowledge on their own.”

Dr. Zapata is an ardent proponent of diversity. “As a Hispanic scientist, I am strongly committed to broadening the participation of underrepresented minorities in the Life Sciences. I recognize the value of diversity to spark creativity in scientific research, and the significance of inclusive educational environments where everyone can thrive.”

To learn more about Dr. Zapata, visit: <http://zapatalab.info>

“I am excited about joining SF State. I am particularly compelled by the strong links the Biology Department has with the Harry D. Thiers Herbarium, the Sierra Nevada Field Campus, Center for Computing in Life Sciences, California Academy of Sciences and other Departments across the campus. The breadth and diversity of the Biology Department offers an ideal opportunity for developing an integrative and exciting research training and outreach program.”

MAY

Dr. Sarah Cohen participated in a scientific dive team in the Western Pacific’s ‘Coral Triangle’ and co-authored “The Significance and Scope of Evolutionary Developmental Biology: A Vision for the 21st Century” published in *Evolution & Development*.

Undergraduate Laboratory Manager **Amber Johnson** received a SFSU Retirement Association travel grant to sample brood stock of the blue-banded goby at Wrigley Marine Station (Catalina Island).

Drs. Tom Parker and **Mike Vasey** co-authored “A Field Guide to Manzanitas: California, North America and Mexico.”

Dr. Pleuni Pennings co-authored “Imperfect Drug Penetration Leads to Spatial Monotherapy and Rapid Evolution of Multidrug Resistance” published in *Proceedings of the National Academy of Sciences*.

JUNE

Dr. Kathy Boyer received a COAST grant for “Conservation Connections: Links Between Eelgrass (*Zostera marina*) and an Extremely Rare High Marsh Plant (*Suaeda californica*) in two California Estuaries.”

Dr. Karen Crow was awarded an ORSP grant for “The Role of Hox Limb Building Toolkit Genes in the Evolution of Novel Vertebrate Features.”



Dr. Andrea Swei (photo left) was awarded an ORSP grant for “Genotypic Variation of a Key Virulence Factor in *Borrelia burgdorferi*.”

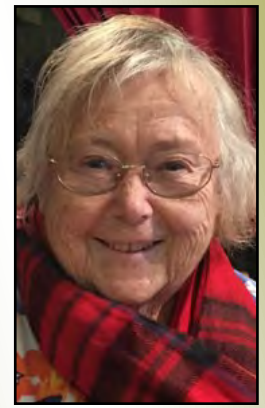
IN MEMORY: ANN AULEB

Professor Emerita and SF State Alumna **Ann W. Auleb** passed away on February 1.

Before joining the Department of Biology in 1984, Ann was a R.N. She earned both her BA in 1985 (Summa Cum Laude) and MA in 1991 at SF State.

It is estimated that during her time as a Lecturer, Ann taught over 36,000 students who enrolled in her courses: Human Sexuality, Psychology of Human Sexuality, Development of Femaleness and Maleness, and AIDS: The Biology of a Modern Epidemic. She co-authored “Laboratory Exercises for Human Biology,” “Human Sexuality” and “AIDS: The Biology of a Modern Epidemic.”

Ann was dedicated on replacing stigmas associated with HIV/AIDS with knowledge, information and humor. She created a popular “Latexhibition” in her classes to raise awareness of safe sex and make students more comfortable about condoms. Ann served as a faculty advisor for SF State Associated Student’s Educational and Referral Organization for Sexuality. She was Chair of the AIDS Coordinating Committee that wrote the AIDS Policy adopted by the CSU, and she led a team of students and faculty colleagues to three international AIDS conferences where they presented SF State’s efforts to confront HIV/AIDS.



ANN AULEB

1932-2016

“Ann poured her heart and soul into her teaching, with special interest in human sexuality and sexually-transmitted diseases.

Every single one of her many students was important to Ann. She made the most of her 83 years.”

— Dr. Michael Goldman
Department Chair

Photo by Bob Bowman



Editor’s note: Did you have Ann Auleb as an instructor while at SF State? Share your memories with other alumni.

Email silver@sfsu.edu.

If you would like to give a gift in memory of Ann, please use the enclosed envelope or visit <http://biology.sfsu.edu> Click on the “Make a Difference” link, select “Biology Department” in the drop down list and write “In Memory of Ann Auleb” in the “Comments” box.

Thank you.

JULY



Dr. Megumi Fuse’s (photo left) work with SF State’s Bridges program was the focus of a *SF State News* article ‘Bridges to the Doctorate Program Receives \$1.28M Grant.’

Dr. Jonathon Stillman and **Adam Paganini** co-authored “Biochemical Adaptation to Ocean Acidification” published in *The Journal of Experimental Biology*.

The **Vance Vredenburg Lab** and other Bay Area researchers called for a ban on importing salamanders over concerns that a fungal disease (*Batrachochytrium salamandrivorans*) killing European amphibians may reach the U.S. (Editor’s Note: In January 2016, the Fish and Wildlife Service banned salamander importation.)

AUGUST

Dr. Kimberly Tanner received a National Science Foundation award for “Investigating the Influence of Informal Understandings about Biology on Formal Learning of Biological Concepts.”



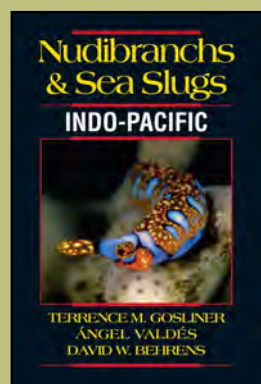
Lecturer **Gloria Nusse** (photo left) presented “From Jericho to the USA, 9000 Years of Forensic Facial Reconstruction” and “An Anatomical Review of the Medico-Legal Aspects of the Historic Ruston Criminal Case” at the International Association for Identification’s 100th Conference.

Dr. Pleuni Pennings received a National Science Foundation grant for “Cityscape Genomics of Rats in New York City.”

“I just finished reading the Fall issue of BioNews. Great issue. I especially enjoyed reading Jackie Langridge-Sahud’s article as it brought back wonderful memories of my favorite professor Margaret Bradbury and my other two favorites Bernie Goldstein and Larry Swan. Both of these guys were awesome story tellers.”



— **DAVE BEHRENS** (BA Biology 1971; MA Marine Biology 1973)



Editor’s note: Dave has co-authored a comprehensive guide “Nudibranchs and Sea Slugs—Indo-Pacific” featuring descriptions of

distinctive characteristics, natural history, size and geographic distribution of 2000 species and includes 2400 photographs.

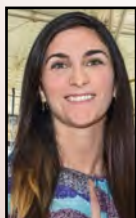
NOTABLE



EVYAN BORGNIS (MS Ecology & Systematic Biology 2013) is a restoration project manager for the California Coastal Conservancy. She authored “Salinity Tolerance and Competition Drive Distributions of Native and Invasive Submerged Aquatic Vegetation in the Upper San Francisco Estuary” published in *Estuaries and Coasts*.



CHARLOTTE CHESNEY (BS Zoology 2015) is a Ventana Wildlife Society Condor Intern.



LALEH ESMAILI COTE (BA Biology 2012) is the Undergraduate Internship Coordinator for the Lawrence Berkeley National Laboratory and the recipient of the “Women @ The Lab” award in recognition of her outreach efforts to increase diversity in STEM fields. Learn more about her work at: <https://sites.google.com/a/lbl.gov/women-at-the-lab/>



RICHARD CYR (MA Cell & Molecular Biology 1982) is a Professor of Biology at Pennsylvania State University and a Program Director at the National Science Foundation.



PAUL HANKAMP (MS Ecology & Systematic Biology 2011) is an Associate Professor of Biology at the College of San Mateo.



ELVIN LAURON (MS Cell & Molecular Biology 2014) co-authored “Rhoptry Proteins ROP5 and ROP18 are Major Murine Virulence Factors in Genetically Divergent South American Strains of *Toxoplasma gondii*” published in *PLOS Genetics*.

SEPTEMBER

Dr. Kathy Boyer received an ‘Outstanding Environmental Project Award’ at the State of the San Francisco Estuary Conference for evaluating oyster reefs and eelgrass for habitat and shoreline protection.

Dr. Sarah Cohen, alumna **Renate Eberl** (MS Ecology & Systematic Biology 2005) and graduate student **Laura Melroy** received a COAST award for “Differential Population Genetic Responses to Severe Disease in Brooding Seastars of the Species Complex *Leptasterias* spp.”



Dr. Megumi Fuse received a National Institutes of Health grant for “San Francisco State University MS/PhD Bridge to the Doctorate.”

Dr. John Hafernik (photo left) received a Distinguished Service Award from the California Academy of Sciences.

OCTOBER

Dr. William Cochlan presented his research on a fish-killing raphidophyte *Heterosigma akshiwo* at the North Pacific Marine Science Organization Annual Meeting.



Graduate student **Melissa Patten** (photo left) received 2nd place for her poster “Morphological Plasticity of a Native SAV Species in the San Francisco Estuary” at the State of the San Francisco Estuary Meeting.

Dr. Vance Vredenburg was interviewed for a *Nautilus* article “When Evolution is Infectious.”

ALUMNI

ANTHONY XAVIER LOPEZ (MS Cell & Molecular Biology 2013) is a lecturer at Pasadena City College, El Camino College and East Los Angeles College.



MARISSA MCMACKIN (MS Physiology & Behavioral Biology 2011) is a Ph.D. candidate in Molecular, Cellular and Integrative Physiology at UC Davis and the primary author of “Use of von Frey Filaments to Assess Nociceptive Sensitization in the Hornworm, *Manduca sexta*” published in the *Journal of Neuroscience Methods*.



TATIANE RUSSO-TAIT (MS Cell & Molecular Biology 2011) received a prestigious University of Texas, Austin Dean’s Scholars Fellowship to pursue a Doctorate degree in STEM Education.



TANISHA SAINI (BS Cell & Molecular Biology 2014) is a GPB Scientific Research Associate working on creating a medical device to detect breast cancer for early diagnosis and detection.



CARLA SETTE (MS Physiology & Behavioral Biology 2013) co-authored “Reconstructing Historical and Contemporary Disease Dynamics: A Case Study Using the California Slender Salamander” published in *Biological Conservation*.



NICHOLAS SILVA (BS Physiology 2011; MS Physiology & Behavioral Biology 2012) is a Ph.D. neuroscience candidate at the University of Michigan, and has been selected to teach a neuroscience course for Dickinson’s College’s Center of Talented Youth Program.



ALISON SANDERS
(BS Zoology 1996;
MA Marine Biology
1999)



Alison Sanders was appointed as SF State’s Chief of Staff to President Leslie Wong in January.

Prior to her current position, Alison served as Interim Associate Vice President and Director of the Office of Research and Sponsored Programs where she oversaw all of the functions of grant and contract administration for the University. She held other positions at SF State including Compliance Officer (2006-2009), Special Projects Manager (2007-2009), and served as the Grants Coordinator for the Romberg Tiburon Center for Environmental Studies (2003-2006).

In her prior life as a biologist, Alison worked as a research technician at the Romberg Tiburon Center, a field biologist for the Oceanic Society’s Belize Dolphin Program and as a research assistant at the San Francisco Zoo.

We want to hear from you!
The Department of Biology
values the success of our alumni.
Email silver@sfsu.edu and tell us
about your latest accomplishments.

NOVEMBER

Drs. Chris Moffatt and Megumi Fuse, graduate students **Dennis Tabuena** and **Eric Arreola** and alumna **Marissa McMackin (MS Physiology 2011)** co-authored “Use of von Frey Filaments to Assess Nociceptive Sensitization in the Hornworm, *Manduca sexta*” published in the *Journal of Neurosci Methods*.



The California Botanical Society dedicated volume 62 of *Madrono* to **Dr. Bob Patterson** (photo left) in recognition of his contributions to the California botanical community.

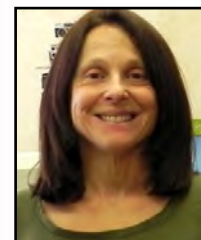
Drs. Blake Riggs and Leticia Marquez-Magana co-authored “Near-Peer STEM Mentoring offers Unexpected Benefits for Mentors from Traditionally Underrepresented Backgrounds” published in *PURM*.

Undergraduate student **Rachel Weinberg** received a COAST award for “*Didemnum vexillum* Fusion Genetics.”

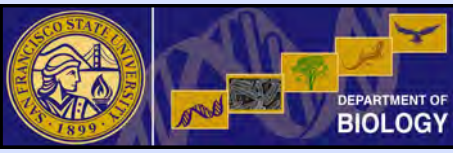
DECEMBER

Dr. Kimberly Tanner co-authored four of the top ten most read articles in *CBE: Life Sciences Education* during 2015.

Professor Emerita Jan Randall (photo right) was elected a Fellow of the American Association for the Advancement of Science for her contributions to the field of animal behavior and animal communication.



The Department’s ZomBee Watch website
was listed in SciStarter’s list of
top citizen projects for 2015!



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Personalized Medicine Conference 9.0:
Gene Therapy & Genome Editing
—This changes everything!

May 26, 2016

8:00 a.m.—6:00 p.m.

South San Francisco Conference Center
<http://personalizedmedicine.sfsu.edu>

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ALUMNUS IS ‘FACE’ OF SF STATE

Adam Paganini (BA General Biology 2008; MS Marine Biology 2013) works at the Romberg Tiburon Center (RTC) in Drs. Jonathon Stillman and Karina Nielsen’s labs where he is a Research Technician but, according to Adam, “I am not your average one.”

“I decided to work at RTC,” explained Adam, “because my interest in animal physiology and climate change research both collide here.” In the Stillman lab, Adam works on the construction and maintenance of a +4,000 L seawater aquarium system. In the Nielsen lab, he works on a network of monitoring systems that send environmental data (water temperature, salinity, pH) to the internet (<http://sfbeams.sfsu.edu>) and on the upkeep and maintenance of RTC’s water quality and meteorological stations. He is also working on a buoy that will be placed near Angel Island to monitor carbon dioxide and measure chlorophyll levels, temperature, pH, and salinity.

While a graduate student in the Stillman lab, Adam studied the physiological responses marine organisms have in response to climate change. He was the lead-author of “Temperature and Acidification Variability Reduce Physiology Performance in the Intertidal Zone Porcelain Crab, *Petrolisthes cinctipes*” which was selected as the *Journal of Experimental Biology*’s ‘Editor’s Choice.’ His photos of porcelain crabs (photo right) were featured on two of the journal’s covers. Currently, he is building aquaria that will fluctuate in temperature and tidal height to study if and how intertidal animals behaviorally thermoregulate.

Away from the RTC labs, Adam plays guitar and sings in a Spanish-singing punk rock band “La Plebe.” The group has played in 17 countries and produced five records. He’s also making himself known around campus as a result of his face being prominently featured on banners (left) hung around SF State and San Francisco.



“Whether it’s studying how animals respond to hypoxia or seeing how CO₂ changes out on the coast after an El Niño event, I would like to continue a path at the RTC — the Bay Area’s best aquatic research center.”

