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BiotechTimes

Marianne Hunter - Editor

FEATURES:

- New NIH/Biotech Fellows
- 2014-15 Graduates Placed
- Internships Placed
- New NIH Website Launched



Annual Biotechnology Program Magazine

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The UC Davis Biotechnology Program is very busy all year long! Welcome to our annual magazine where we get to show off some of the many programs and activities that we are involved with throughout the academic year.

Have something interesting to share? Contact us so we can post it on our various social media outlets.

DEB STATISTIC

There have been 205 DEB students since 2002 that have graduated with a PhD and also received their designated emphasis in biotechnology on their diploma. That also means 205 paid internships have been successfully completed!

On the cover: 2014-15 NIH/Biotech Fellows at the 2015 Annual Biotechnology Training Retreat in Napa.

L-R Front: Anna Marie Tuazon, Nicole Nozzi, Sam Westreich, Allison Hoch, and Rosanna Kwok

L-R Back: Doug Gettel, Christopher Siltanen, Keith Dunaway, Johnathon Anderson, and Casey Boosalis

Welcome to the 2015 edition of the Biotech Times. This past year has passed by very quickly due to all of our many projects. We even hired another



administrative assistant to ease the workload. Please welcome Jacqueline Phillips to our Biotech family. She has been a wonderful addition to our team. In addition, we hired a part time budget analyst to assist us with high level analysis and forecasting. Ms. Kelly Meade's first

day was September 1, 2015. She has a degree in accounting from Sacramento State. We plan to keep her very busy!

Our stellar Designated Emphasis in Biotechnology (DEB) program continues to grow in the number of students, faculty and graduate programs. The DEB currently has over 210 PhD students from 30 different disciplines and 18 students graduated in the 2014-15 academic year. This gives us 201 graduates since the beginning of the program in 1997. We continue to be the largest DE on campus offering a unique pre-doctoral graduate

training program that addresses the needs of the 21st Century. The DEB serves as a powerful recruitment tool for the campus. Each fall, I have the honor to talk about the DEB and the NIH T32 Biotech Training Grant at the BMCDB Colloquium as well as address the first year PhD students in the NIH IMSD Program (focused on underserved populations). We are very proud of the fact that over 20% of our DEB students are from underrepresented minority populations. I feel that the additional mentoring and the enhanced experiences help to retain these students so that they earn their PhDs.

In the 2014-15 academic year, we placed 23 students in internships (industry and campus). Most were placed in California, but some were in pharmaceutical companies on the east coast and a few were international. The College of Biological Sciences and the Biotechnology Program have a new partnership with Allergan, Inc. in Irvine, CA. A formal MOU was created to commit to taking up to two DEB students per year. We are sending our first student this fall. Without our industry and campus partners, the DEB could not continue to be such a stellar program. Please see the newsletter for more information.



Equity issues are still a concern and the Biotechnology Program wants to be a leader in this effort. In 2013, our DEB students, Jeni Lee and Nicole Chaffee led the WiL (Women in Leadership) series. In 2014-2015, Anna Marie Tuazon and Ailsa Dagliesh took over the leadership and created ESTEME (Equity in STEM and Entrepreneurship) so that it addresses issues of women and men. In 2015-2016, we have Doug Gettel and Samantha Feng leading the way. Please see the website for more information: <http://biotech.ucdavis.edu/ESTEME/index.html>

DIRECTOR'S MESSAGE (Cont)

People are noticing the DEB and the support of Leadership and Equity. On Sept. 9, 2015, I was asked to be the keynote for the Bioscience Career Track at Oregon Bio 2015 in Portland, Oregon. The focus of my presentation was on our DEB program. The title of the talk was "Maximizing Your Full Potential as a Scientist in the 21st Century". I was also part of a panel discussion on Women in Leadership in STEM. On Feb 23, 2015, I was invited to present to post-docs about careers and empowerment at the Buck Institute in Novato. Again, I used the DEB as a successful model. See blog <http://sage.buckinstitute.org/maximizing-your-full-potential-as-a-scientist/>.

Last January, I was a keynote for UC Davis WRRC's Women of Color Symposium. The title of my talk was "An Entrepreneurial Spirit- a Key to Success" (based on the DEB model). Last March, I was honored to receive one of the Chancellor's Achievement Award for Diversity and Community. It is nice to be recognized for our hard work in transforming graduate education.

Due to restructuring with the MCB (Molecular & Cellular Biology) department, our courses will have our own course codes – DEB 294, DEB 263 and DEB 282 and the Biotechnology Program will coordinate the staffing for the



courses. Marianne Hunter is overseeing this huge effort. We owe her a big thank you for her hard work. I guess the DEB graduate program is no long a pilot program; it is becoming institutionalized. We hope some funding comes with this change!

As stated last year, we received another 5 year competitive renewal of the NIH T32 Graduate Training Program in Biomolecular Technology in 2012. We even received an extra slot from NIH, so we can fund 10 outstanding scholars each year. We are in the planning stages for submitting another renewal in the spring of 2016. We will need a lot of support from our campus leaders and our industry partners so that we can continue this stellar Biotechnology Training Program. Please see the section on the

Biotechnology Training Grant in the newsletter for more information on each fellow. We are so proud of our 2015-2016 Fellows, they represent the cross disciplinary nature of our program so well. They can be found on our website at http://www.niht32.ucdavis.edu/Current_Fellows.

The Advanced Degree Program (ADP) for corporate employees is still operating, but the great recession slowed our growth. As the economy improves, we hope to add 1-3 new participants in the upcoming year. As more companies move into the region, this program will be a great vehicle for retention of excellent employees who wish to earn a doctoral degree. The magazine has more details on the participants. One of our most recent graduates of the program was Shaunese Lambel, who



DIRECTOR'S MESSAGE (Cont)

received her PhD in Genetics. She works at Harris Moran Seed Co and her corporate mentor was Eileen Kabelka and UC Davis mentor was Prof. Roger Chetelat. Brooks Hayes from Expression Systems received his PhD in Biochemistry, Molecular, Cellular & Developmental Biology and his corporate mentor was Thera Mulvania and UC Davis mentor, Professor Bruce Hammock.

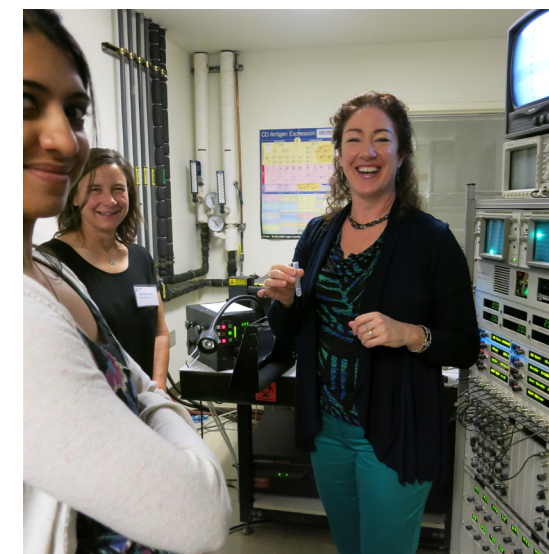
We offered two short courses over the summer, Flow Cytometry and Proteomics. We are fortunate to have two wonderful instructors for these intensive classes who received stellar reviews from the participants at the end of instruction. Thank you Bridget McLaughlin, director of the FACS facilities on the Davis and Sacramento campuses and to Dr. Brett Phinney, director of the Proteomics Core Facility in the Genome Center!

A big thank you also goes to Dr. David Hedin, the CEO and Founder of Expression Systems who is a wonderful industry partner. Without his generous support, our Train the Trainers course offered for



free to high school and community college instructors would not exist! We depend on the generosity of our life science industry partners to serve our community of researchers and teachers.

Community Outreach activities are an important part of our efforts to pay it forward. The BioTech SYSTEM, Teen Biotech



on Pharmaceutical R&D and Manufacturing in California at the State Capitol in regards to the effects of NIH sequestration on university biomedical research and training. I urged the committee to increase funding to UC so we could continue to be a leader in biotechnology-related research. Last fall, I was selected as an Inspirational Mentor for the **One UCDAVIS Banner Campaign**. I love mentoring students (high school to PhD level). Please check out the banner at <http://ucdavis.edu/one/stories/mentors/kjelstrom-sahota.html>.



Challenge, CIRM Creativity Grant, Picnic Day Biotech Event, advisory roles for High School Biotech Academies and the Power House Science Center, Science Communication Fellows, Dinner with a Scientist, presentations and campus tours keep Denneal, the DEB students and me very busy. On February 12, 2014, I was asked to testify on behalf of UC Davis to the Assembly Select Committee on Biotechnology Hearing

Since 2012, Denneal and I have served on the Education Committee for the new PowerHouse Science Center in Sacramento. This summer, I was asked to chair the Education Committee as we get closer to breaking ground for the new science center on the Sacramento River. I continue to serve on the Executive Board of Directors so that UC Davis has a strong presence



on this important project. This promises to be a wonderful regional hub for STEM research, education and career explorations. In 2012, the Powerhouse Science Center was selected as one of 10 NSF funded PopNet (Portal to the Public) centers in the U.S. for informal science training. I recommended 10 PhD students to be trained as the inaugural Science Communication Fellows. Since then, another 25 DEB students have been trained as Science Communication Fellows. This is a wonderful program for learning how to effectively communicate science to the public. Our communication fellows demonstrated their teaching tools at the Angels for Hearts "When I Grow Up" event again this summer and were a big hit. As a result of our successful Teen Biotech Challenge competition, Dr. Jan Nolta and Dr. Gerhard Bauer from the Institute of Regenerative Cures in the School of Medicine and the Biotechnology Program wrote a Creativity grant to the California Institute for Regenerative Medicine (CIRM). We are in the last year of a three year grant to provide 10 TBC winners with a paid summer research experience in stem cell biology. We are submitting a new CIRM Creativity grant proposal this fall. We hope to be renewed by CIRM because these high school students love this opportunity to do research and present a scientific poster at the annual conference.

Denneal and I continue to be involved in leadership and mentorship issues, especially for women in STEM. There is a

need for strategic career planning, entrepreneurship and advanced level network development. I continue to join my Leadership California alumnae in meetings with delegations of women leaders and entrepreneurs from all over the world. These women are part of the U.S. Department of State's "100 Women Initiative: Empowering Women and Girls through International Exchanges". It is an honor to share our Best Practices in education, equity, technology and business development as well as leadership. Denneal has been very active with the UC Davis ADVANCE Program to advance opportunities for women faculty. Last year, two of our DEB students, Jeni Lee and Nicole Chaffee did a fantastic job in organizing the Women in Leadership (WiL) STEM series. Last spring, we led a panel discussion on Women in Leadership for the U.S Embassy Staffer in cooperation with the Northern California World Trade Center and Leadership California. Denneal, Professor Karen McDonald, Jeni, Nicole and I spoke candidly about equity in STEM disciplines. By the way, Denneal is completing her year of California Issues and Trends Program this year, so she will be an alumna of Leadership California in 2016. The journey in leadership is an ongoing effort.

Enjoy our magazine.

Dr. Judy Kjelstrom



2015-16 NIH/ BIOTECH TRAINEE RECIPIENTS

Congratulations to the outstanding students who were selected as the **2015-2016 NIH and Biotech Fellows**. There were 28 fellowship applicants this year and all were exceptional candidates!

NIH

Karan Agrawal, Pharmacology & Toxicology (John Newman, Preceptor). Using metabolomics to develop non-invasive diagnostic methods for inflammatory skin diseases.

Jasmine Corbin, Chemical Engineering (Karen McDonald, Preceptor), Process Development for the Production of a Heterologous Glycoprotein in Transgenic Rice Cell Culture.

Rosanna Kwok, Entomology (Joanna Chiu, Preceptor). Temporal Dynamics of Epigenetic Landscape Enable Fine-Tuning of Circadian Transcription in *Drosophila*

Nicole Nozzi, Chemistry (Shota Atsumi, Preceptor). Developing Production of a Plant Alkaloid in a Microbial Host.

Anna Marie Tuazon, Biochemistry, Molecular, Cellular and

Developmental Biology (Luis Carvajal-Carmona, Preceptor). Population Isolates From Columbia Enable Identification of Novel Breast Cancer Risk Genes.

Sana Vaziri, Computer Sciences (Sharon Aviran, Preceptor). Data Driven Integration of Multiple Probe Measurements.

Biotech

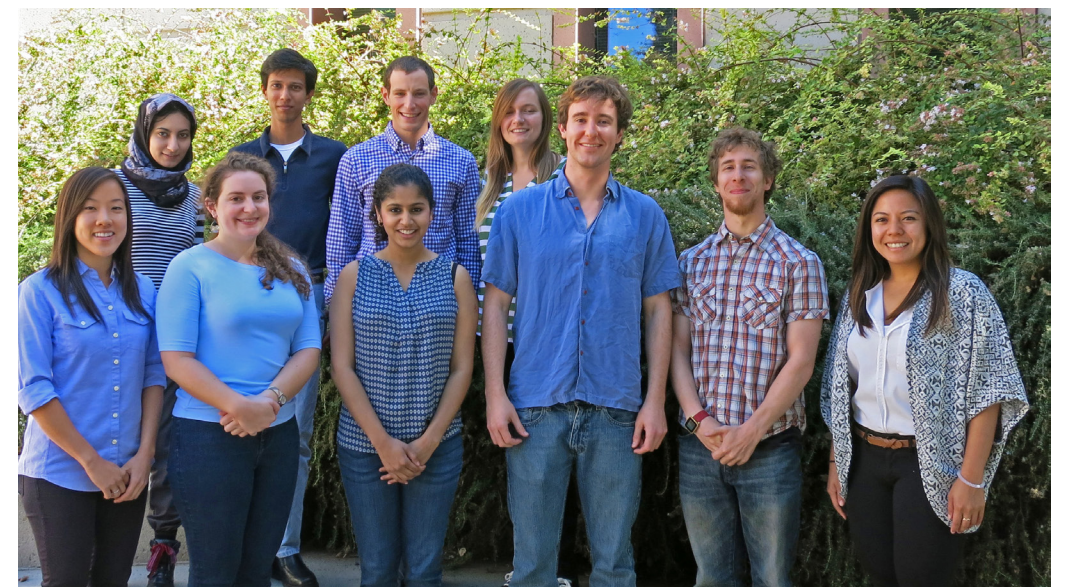
Joshua Cohen, Food Science (Daniela Barile, Preceptor). Cloning Bifidobacterial Enzymes to Release Bioactive Glycans.

Daniel Lewis, Integrative Genetics & Genomics (Cheemang Tan, Preceptor). Competitive Regulations Modulate Topology of Gene Networks.

Debika Mitra, Biomedical Engineering (Kent Leach, Preceptor). Interrogating Collagen Crosslinks in Engineered Matrices as a Model for Bone Repair in Diabetic Patients.

Sam Westreich, Integrative Genetics & Genomics (Ian Korf, Preceptor). Novel Methods in Metatranscriptomics: Examining the Gut Microbiome of Idiopathic Chronic Diarrhea.

We are grateful to Monsanto for their industry fellowship as well as to the campus for their NIH fellowship matching support!





- To allow cross-disciplinary training and trainee experience in a biotechnology company or cross college laboratory.

This program supplements a student's Ph.D. curriculum and those completing the DEB Program will obtain an official designation on their diploma and transcript indicating

THE DESIGNATED EMPHASIS IN BIOTECHNOLOGY (DEB)

graduate program is an inter-graduate group program that allows Ph.D. students to receive and be credited for training in the area of biotechnology.

There are approximately 230 students from 30 different graduate

groups. The UC Davis Biotechnology Program is the administrative home for this program.

The DEB provides a nurturing, interactive environment to promote integration of multiple disciplinary approaches to conduct research and to promote learning in biotechnology.

The DEB helps:



- To provide well-coordinated, cross-disciplinary training of graduate students in critical areas of biomolecular technology research.

- To promote interdisciplinary research environments that integrate basic biological science, engineering and computational disciplines.

a qualification in biotechnology.

Course requirements are covered on the DEB website..



ON MARCH 14TH, THE BIOTECHNOLOGY Program held their 24th Annual Training Retreat for fellowship recipients and their mentors, industry affiliates and our DEB students and faculty members. The retreat is held each Winter or Spring Quarter at the Christian Brothers Retreat and Conference Center in the Napa Valley. Mark your calendars for the 2016 Retreat which will be held on March 5th!

During the retreat, the fellows and invited industry affiliates gave oral presentations on their research. In addition to these oral presentations, poster sessions (open to all attendees) are held to stimulate one-to-one interactions, provide networking opportunities, and possible collaborations.

Every retreat, a bioethics question is presented, followed by answers and discussions. Dr. Denneal Jamison-McClung, the Associate Director of the Biotechnology Program presented her ethics discussion on, "ZMapp Can Zap Ebola!... Or, Can It? Mobilizing a Global Response to a Public Health Crisis", in which a very lively discussion followed with excellent answers!



Thank you to Dr. Timothy Conner (Monsanto), Dr. Christopher Muriel (OncoMed Pharmaceuticals), Dr. Alice Yam (Sutro Biopharma, Inc.); Dr. Jeannie Giacchino (Bavarian Nordic, Inc.), and *Dr. Gian Oddone (Agrinos, Inc.) for joining us to share information about the latest from their companies and to meet our fellows!

*Gian Oddone was a DEB graduate student as well as an NIH Fellow! It's great to have former students keep in touch!

THE ADVANCED DEGREE PROGRAM (ADP) for Corporate Employees is a program that allows the working professional to complete a doctorate in a number of graduate programs within the Biological Sciences and Engineering programs. The ADP is coordinated by the Biotechnology Program in conjunction with Graduate Studies, the College of Biological Sciences, and the College of Engineering.

The ADP is a very successful academic-industry partnership and one of the highlights of the year is our annual luncheon in which the faculty and administrators interact with ADP students and the corporate mentors. It is also a time to introduce the program to prospective company employees.

Congratulations go to:

Brooks Hayes (BMCDDB Graduate Group) from Expression Systems who received his PhD in 2014. Brook's industry mentor was Dr. Thera Mulvania and his UCD mentor was Professor Bruce Hammock.

Shaunese Lambel (Genetics Graduate Group) from HM Clause who received her PhD in 2014. Her industry mentor was Dr. Eileen Kabelka and her UC Davis mentor was Professor Roger Chetelat.



"26 DEB grads, 2014-15 academic year"

THROUGHOUT THE 2014-2015 academic year, there were 26 students in the DEB Program who received their PhDs along with a Designated Emphasis in Biotechnology. These exemplary students took the full DEB coursework, including the 3 – 6 months internship (MCB 282). The Biotechnology Program is very proud of the hard work they put in to achieve their goals and would like to recognize them in this magazine.

Lisa Anderson (PI: Annaliese Franz) PhD Chemistry, now a postdoc in the Prather chemistry lab at Massachusetts Institute of Technology

Jesse Bakke (PI: Fawaz Haj) PhD Nutritional Biology, now a postdoc at Saint Jude Children's Research Hospital.

Patricia Castillo (PI: Charles Bevins) PhD Immunology, postdoc at UC Davis department of Medical Microbiology & Immunology.

Arnold Chen (PI: Tingrui Pan) PhD Biomedical Engineering, now a R&D Scientist Agilent Technologies.

Elieke Demmer (PI: Marta van Loan) PhD Nutritional Biology, now RD Manager Nutrition Research at Dairy Management, Inc.

Anna Erickson (PI: Anna Fisher) PhD Biochemistry, Molecular, Cellular & Developmental Biology, now Postdoctoral Fellow at Stanford University.

Erin Fong (PI: Rajeevan Amirtharajah) PhD Electrical &

Computer Engineering, now an electrical engineering postdoc Fellow at Lawrence Berkeley National Lab.

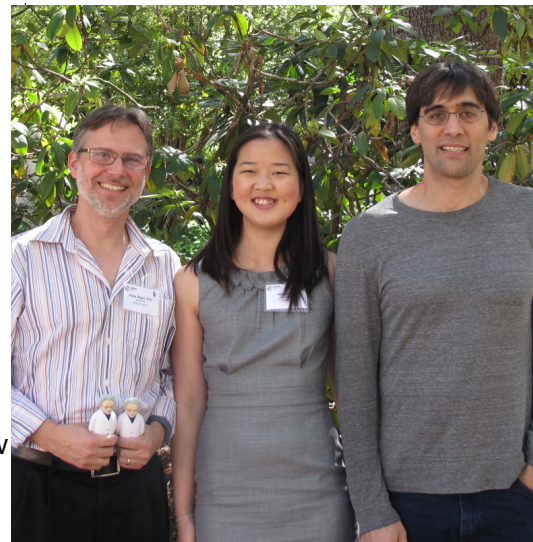
Siobhan Halloran (PI: Bill Ristenpart) PhD Chemical Engineering, a postdoctoral fellow at Icahn School of Medicine at Mount Sinai School of Medicine.

Allison Hoch (PI: Kent Leach) PhD Biomedical Engineering, now a Clinical Science Consultant at Boehringer.

Vicki Hwang (PI: Robert Weiss) PhD Integrative Genetics & Genomics, now Postdoc at UC Davis' Internal Medicine, Nephrology, Robert Weiss Lab.

Rachel Kerwin (PI: Dan Kliebenstein) PhD Plant Biology, now postdoc in the Sweigart Lab, Dept of Genetics at the University of Georgia in Athens, GA

Jennifer Lee (PI: Kyriacos



Athanasios) PhD Biomedical Engineering, co-founder of ViVita Technologies.

Karen LeGrand (PI: Glenn Young) PhD Microbiology, now US Borlaug Global Food Security as a Graduate Research Fellow at US Agency for International Development (USAID).

Alan Lombard (PI: Maria Mudryj) PhD Biochemistry, Molecular,

FAST DEB FACTS

Average time for a DEB student to graduate with a PhD and DEB on their diploma is 5 years, 1 quarter.

The percentage of DEB male and female students is practically the same. There are only 14 more female students.

More DEB students come from the Biochemistry, Molecular, Cellular & Developmental graduate group than any other.

There have been over 605 DEB students enrolled in the program since 2000.



Cellular & Developmental Biology, now Post-doc - Allen Gao's lab at UC Davis.

Kevin Martin (PI: Jared Shaw) PhD Chemistry, now postdoc fellow at California Institute for Biomedical Research & Scientific Collaborator at Scripps Research Institute.

Jared Moore (PI: Jared Shaw) PhD Chemistry, now a NIH Postdoctoral Fellow at Caltech.

Meghan Murphy (PI: Kyriacos Athanasios) PhD Biomedical Engineering, now a biomedical engineer at The Shop Innovation Lab, VSP Global, Sacramento.

John Oliver (PI: Shota Atsumi) PhD Chemistry, now Post doc at Harvard Medical School and the Wyss Institute with Pamela Silver.

Nadia Ono (PI: Li Tian) PhD Biochemistry, Molecular, Cellular & Developmental Biology. Dipali Patel (PI: Alexander Revzin), PhD Biomedical Engineering.

Jonathan Pham (PI: Scott Dawson), PhD Microbiology, now a postdoc at Novozymes.

Gabriel Rodriguez (PI: Shota Atsumi), PhD Chemistry, now postdoc at Clemson university, South Carolina.

Amy Schroeder (PI: Marty Privalsky), PhD Biochemistry, Molecular, Cellular & Developmental Biology, now at Genentech; Regulatory Affairs Intern supporting HER2 group.

Chelsea Snyder (PI: Marty Privalsky), PhD Microbiology, now a Research Scientist at Gilead Sciences.

Katherine Walker (PI: Simon Cherry), PhD Biomedical Engineering.

Abigail Yu (PI: Ian Korf & David Segal), PhD Integrative Genetics & Genomics, now Associate Research Scientist at Sutro Biopharma, SF.

Nancy Zeng (PI: William Ristenpart), PhD Chemical Engineering, now Process Engineer at Intel Corporation, Sacramento, CA.

One of the requirements of the Designated Emphasis in Biotechnology graduate program is interning for at least three months at a cooperating biotechnology company, government agency or a cross-college site. Many DEB students have completed their internships over the past year and several have started this fall. We are sending our students to diverse locations, even international sites.

We wish to thank all of our industry partners who offered internships for our DEB students. See where our students interned during the 2014 -2015 academic year:

Agilent Technologies, Santa Clara: Arnold Chen
American River College, Los Rios Teaching College: Geoffrey Benn

Amplimmune, Gaithersburg, MD: Alan Lombard

Amyris Biotechnologies, Emeryville: Lisa Anderson

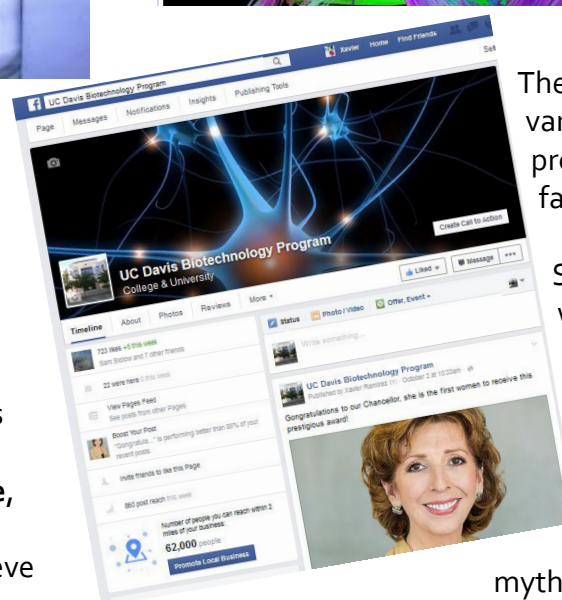
Aquilo Capital Management, SF: Jennifer Lee (also ViVita Technologies, Davis, CA)

Bayer CropScience, Berkeley, CA: Ben Golomb

Bayer HealthCare, Berkeley, CA: Wade Zeno
Celgene: Brian Avanzino,



Genentech Facility in South San Francisco



The Biotechnology Program uses various forms of social media to promote its program, students, faculty, and many activities.

See below for some of the tools we use to get our messages across.

- Celgene (cont):** Kateryna Feoktistova
- Emory University:** Kevin Martin
- Genentech, SF:** Chelsea Snyder, Shailise Ross, Allison Hoch, Brandon Brown, Tin Ngo, Siobhan Halloran, Christian Siltanen, Marjannie Eloi-Akintunde
- Glaxosmithkline:** JohnPatrick Rogers
- IBM Research, SF:** Kristen Beck
- International Rice Research Institute, Philippines:** Daniel Caddell
- Mendota Bioenergy LLC, Fresno:** Steve icari
- Monsanto, Calgene Campus:** Marta Bjornson, Natasha Worden, Hossein Gouran
- Novozymes, Davis, CA:** Jonathan Pham, Silvia Hilt, Jordan McEwen
- Oculeve, SF:** Nithin Dhananjayan
- OPX Biotechnologies, Inc., Boulder, CO:** Gabriel Rodriguez
- Seminis Seed, Woodland:** Timothy Butterfield
- Small Molecule Discovery Center (SMDC), UCSF:** Sucheta Mukherjee
- Sutro BioPharma, SF:** Abigail Yu
- The Shop Innovation Lab, VSP Global, Sacramento:** Meghan Murphy
- UCD Innovation Access:** Nadia Ono
- US Army Corps of Engineers:** Jessica Moore

- UC Davis Biotechnology Program's Facebook Page
- Twitter (@JKjelstrom, @yggdrasil13751, @mythodology)
- LinkedIn Groups: "UCD Biotechnology Program" Group, "UC Davis Biotechnology Program NIH Fellows" Group, Other: Judy Kjelstrom, Denneal Jamison-McClung, Marianne Hunter

- Google+
- Biotechnology Program's website
- DEB website
- Biotechnology Program's NIH Training T32 website
- BioTech System website
- TBC website



This hallmark event has been designed to showcase and celebrate the richness of campus life, the diverse achievements of UCD students, staff and faculty to provide a day of education, information and entertainment to all who attend. The Biotechnology Program Event allows the general public to have a hands-on experience in various biotech-related experiments, including cheese making, DNA extraction, and the new developments for stonewash jeans dye.

To see more photos, click on the link for this year's Picnic Day Biotech Event.



We wish to express our appreciation to all our industry partners for their donations, as well as the DEB graduate students for running the experiments. Industries who donated to the event included: Genentech, Monsanto-Calgene Campus, and Novozymes.



Our very own DEB students ran all the experiments and were wonderful UC Davis and DEB ambassadors. Thank you: Johnathon Anderson,

Mina Azimi, Kristen Beck, Daniel Caddell, Annie Chiu, Adam Contreras, Maher Elsheikh, Samantha Feng, Jena Gallegos, Doug Gettel, Hyrum Gillespie, Hyun Tae Hwang, Angelica Kowalchuk, Rosanna Kwok, Malgorzata Liro, Alice Martinic, Lucas McKinnon, David Merriam, Akshata Mudinoor, Gulustan Ozturk, Ali Rahimian, Sonia Reveco, Juan Reyes, Cintia Helena Duarte Sagawa, Chelsea Snyder, Allison Stevens, Jessica Stolfi, Scott Strobel, Brandon Tautges, Wade Zeno!

BioTech SYSTEM Update
Academic Year 2014-2015
By Denneal Jamison-McClung, PhD

BioTech SYSTEM is a regional K-14 STEM outreach consortium administered by the UC Davis Biotechnology Program. With deep appreciation for their generosity, we rely on the volunteer efforts of Designated Emphasis in Biotechnology (DEB) doctoral students to engage students, teachers and community members in informal science learning. DEB students share their passion for scientific discovery and innovation, providing participants with the latest information on biotechnology career paths and research directions. BioTech SYSTEM activities, such as the Teen Biotech Challenge, would not be possible without the support of the region's business community and biotech industry partners, including Expression Systems, Genentech, Bayer CropSciences, Novozymes and Monsanto.

In 2014-2015, the BioTech SYSTEM engaged hundreds of California students, teachers and community members in informal science learning activities via Biotech Tour Days, HS student e-mentoring programs, career fairs, science fairs, special outreach events hosted by collaborators (e.g. Angels for Hearts, Dinner with A Scientist, Expanding Your Horizons, Powerhouse Science Center), the annual Teen Biotech Challenge (TBC) web design competition and the Modern Farming Workshop for High School Teachers. We also teamed up with eminent UC Davis stem cell biologists and clinicians, led by Gerhard Bauer, to offer Research Scholar Awards to ten of the region's high school students.

Biotech Tour Days

Science communication to non-specialist audiences is a great skill to acquire during grad school and our DEB volunteers had many opportunities to hone their presentation skills during Biotech Tour Days. In 2014-2015, we hosted biotech seminars



and walking tours for ~200 Northern California high school students interested in learning more about life sciences and engineering career paths. Many thanks to the DEB volunteers who prepared "elevator pitch" talks and led campus tours: Hannah Aizad, Brittany Anderson, Matthew Blain-Hartung, Destiny Davis, Zachary Fogassy, Jenna

Gallegos, Doug Gettel, Vu Lam, Jeni Lee, Jordan Mancuso, Alice Martinic, David Merriam, Debika Mitra, Allison Stevens, John Uhrig, Erica Vonasek, Donnelly West, and Eric Zheng. Participating high schools included: American Canyon HS, Antelope HS, Colusa HS, Einstein MS (Sacramento), James Enochs HS (Modesto), Piner HS (Santa Rosa) and Sheldon HS (Elk Grove).

Teen Biotech Challenge

The 2015 Teen Biotech Challenge web design competition was a hit with the region's high school teachers and students once again. An all-time high of 796 students submitted registrations for 414 preliminary websites, with 195 students and 113 websites advancing to the final round of judging by DEB volunteers. Ultimately, we awarded the 62 winning websites across seven focus areas: Agricultural Biotechnology; Computational & Systems Biology; Drug Discovery & Biomanufacturing; Environmental Biotechnology; Nanobiotechnology; Personal Genomics & Human Health; and Regenerative Medicine. To view the winning websites, visit <http://teenbiotechchallenge.ucdavis.edu/index.html>.

Biotech Program staff and DEB volunteers for website judging and event hosting made TBC2015 possible! Many thanks to our team, Marianne Hunter, Jacki Balderama and Jacqueline Phillips, as well as the DEB volunteers. TBC Judges included doctoral student experts across the seven competition focus areas: Brittany Anderson, Mina Azimi, Kristen Beck, Daniel Caddell, Destiny

Heeney, Hyun Tae Hwang, Malgorzata Liro, Rita Luu, Amory Meltzer, Akshata Mudinoor, Nicole Nozzi, Esther Shin, David Silberstein, Scott Strobel, Tang Tang, Denise Trans, Kim Truong, and John Uhrig. TBC Event Hosts sacrificed a Friday night (likely of lab research!) to ensure that the award celebration was a welcoming experience for student winners and their loved ones (for some guests, TBC2015 offered an opportunity for their first visit to a university campus): Johnathon Anderson, Liz Anthony, Doug Banda, Cintia Helena Duarte Sagawa, Keith Dunaway, Doug Gettel, Angelica Kowalchuk, Lauren Matelski, Debika Mitra, Chuong Nguyen, Nicole Nozzi, Gulustan Ozturk, Esther Patchin, Tang Tang, Kim Truong, Toni West, Abigail Yu, and Ray Zhang.

Finally, TBC2015 community sponsors of student prizes and the award reception were: Bayer CropScience, Novozymes, Element Realty and the UC Davis Biotechnology Program.

Research Scholar Awards

An ambitious subset of the TBC2015 student participants applied for Research Scholar Awards funded by a California Institute of Regenerative Medicine (CIRM) Creativity Award. Ten awarded students dedicated their summer vacation to an intensive stem cell biology research training program headed by Gerhard Bauer at the UCDMC Institute for Regenerative Cures. The hands-on learning experience culminated in the CIRM Creativity Day research conference featuring presentations by trainees from Children's Hospital Oakland Research Institute (CHORI), City of Hope, Gladstone Institutes, Stanford University, UC Davis, UC San Francisco, UC Santa Barbara and the University of Southern California.

E-Mentoring & Career Fairs

DEB volunteers share their personal academic journeys, career advice and knowledge of STEM opportunities with hundreds of high school and middle school students in the region every year through e-mentoring and career fair participation.

In fact, DEB volunteers compose a significant fraction of STEM e-mentors recruited by the biotech academies at Sheldon HS (Elk Grove) and Vallejo

HS each spring. The mentoring programs last eight weeks and culminate with a mentor-mentee mixer. E-mentors in the spring of 2015 included:

Nicholas Aguirre, Johnathon Anderson, Leif Anderson, Liz Anthony, Brian Avanzino, Nicole Chaffee, Adam Contreras, Amanda Dang, Destiny Davis, Shuchi Desai, Marjannie Eloi, Jenna Gallegos, Anupama Ganesh, Aiza Go, Dustin Heeney, Silvia Hilt, Pui Yan Ho, Gena Hoffman, Vicki Hwang, Mittal Jasoliya, Alan Sophie Kiss, Rosanna Kwok, Jeni Lee, Malgorzata Liro, Alan Lombard, Simon Jesse Lopez, Amelia Manlove, Lucas McKinnon, Emily Mills, Debika Mitra, Chuong Nguyen, Leslie Nickerson, Alan Nguyen, Nicole Nozzi, Juan Reyes, Megan Showalter, Natasha Shroff, Scott Strobel, Linda Su-Feher, Emily Thompson, Kim Truong, Kacey VanderVorst, Toni West, Sam Westreich, Le Yee, Garrick Yuen, Eric Zheng, and Steve Zicari.

In addition to e-mentoring, the BioTech SYSTEM supported regional career fairs, including Douglass MS (Woodland), Lee MS (Woodland) and the regional Expanding Your Horizons (EYH)* event for middle school girls, held at Sacramento State University. Thanks to DEB volunteers who dedicated time to STEM outreach via career fairs: Ailsa Dalglish, Jenna Gallegos, Pui Yan Ho, Jeni Lee, Akshata Mudinoor, Natasha Shroff, Kay Watt and Natasha Worden.

Picnic Day & Hands-On Demonstrations

One of the best ways to learn is by "doing" and many of the DEB students look forward to Picnic Day each



(Navneet Sandhu, Research Scholar from Antelope HS)



year, when we help hundreds of community members extract DNA from strawberries and better understand the use of industrial biotech enzymes in our everyday lives (cheesemaking and textile processing!). All hands on deck for Picnic Day 2015 included our reagent/supply preparation crew: Annie Chiu, Jenna Gallegos, Alice Martinic, Gulustan Ozturk, Chelsea Snyder and Wade Zeno. Teaching the fine art of pipetting and running the experimental stations at the event were: Johnathon Anderson, Mina Azimi, Kristen Beck, Daniel Caddell, Adam Contreras, Cintia Helena Duarte Sagawa, Maher Elsheik, Samantha Feng, Doug Gettel, Hyrum Gillespie, Hyun Tae Hwang, Angelica Kowalchuk, Rosanna Kwok, Malgorzata Liro, Lucas McKinnon, David Merriam, Akshata Mudinoor, Ali Rahimian, Sonia Reveco, Juan Reyes, Allison Stevens, Jessica Stolfi, Scott Strobel, and Brandon Tautges.

For more information on the BioTech SYSTEM, check out the latest happenings on our website <http://biotechsystem.ucdavis.edu/>.



All DEB graduate students are encouraged to present one chalk talk. It is a venue where students interact with other trainees and present their own research work and hear about the research of other DEB students. See below for the list of 2015-2016 Chalk Talks scheduled.

- FALL 2015** 10/7/2015 12:10
Justin Thomas (PI: Peter Beal) Chemistry
- 10/21/2015 12:10
Karan Agrawal (PI: John Newman) Pharmacology & Toxicology
- 11/4/2015 12:10
Nicole Chaffee (PI: Sheila David) Chemistry
- 12/2/2015 12:10
Natasha Worden (PI: Georgia Drakakaki) Plant Biology
- WINTER 2016** 1/27/2016 11:10 S
Sana Vaziri (PI: Sharon Aviran) Computer Science
- 2/3/2016 11:10
Christopher Chapman (PI: Erkin Seker) Biomedical Engineering
- 2/24/2016 11:10
Chandrima Majumdar (PI: Sheila David) Chemistry
- SPRING 2016** 4/6/2016 12:10
Scott Strobel (PI: Tina Jeoh) Biological Systems Eng.
- 4/20/2016 12:10
Adam Contreras (PI: Min Zhao) Biochemistry, Molecular, Cellular & Developmental Biology
- 4/27/2016 12:10
Jenna Harvestine (PI: Kent Leach) Biomedical Engin.
- 5/4/2016 12:10
Nicole Nozzi (PI: Shota Atsumi) Chemistry
- 5/18/2016 12:10
David Merriam (PI: Dennis Hartigan-O'Connor) Microbiology

FALL BIOTECH FRIDAY SEMINARS, MCB/ECH 294 (OPEN TO THE PUBLIC)

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| 11:00 AM 1022 LS | Organizational Meeting Dr. Judy Kjelstrom (Biotechnology Program & DEB program coordinator) Prof. Karen McDonald (ECH) – (instructor) Prof. Ray Rodriguez (MCB) – (instructor) | September 25 |
| 11:00 AM 1022 LS | Big Bang Kickoff Niki Peterson – Program Manager, UCD Child Institute for Innovation and Entrepreneurship Sensozyme presentation (2015 Big Bang! People’s Choice Winner) Scott Strobel and Akshata Ramnath Mudinoor , DEB Students | October 2 |
| 11:00 AM 1022 LS | What is Intellectual Property? Nancy E. Rashid, Ph.D. Intellectual Property Officer, Technology Transfer Services UC Davis InnovationAccess | October 9 |
| 11:00 AM 1022 LS | Commercialization Opportunities and Challenges in the Microbiome Colleen Cutcliffe, PhD Co-Founder and Chief Executive Officer Whole Biome, S.F. | October 16 |
| 11:00 AM 1022 LS | Considerations when starting a company as a Graduate Student or Post-Doc Zane Starkewolfe, PhD Associate Director-New Venture Resources Venture Catalyst, UC Davis Former DEB Student | October 23 |
| 11:00 AM 1022 LS | Biotech Everywhere: How Lean Biotech Will Change the World Ron Shigeta, PhD Chief Science Officer IndieBio | October 30 |
| 11:00 AM 1022 LS | Venturing into the Marketplace: What Does it Take to Get There? Tania Fernandez, PhD Founder DreamCatcher Ventures, SF | November 6 |
| 11:00 AM 1022 LS | The Story of Inserogen Karen McDonald, PhD & Lucas Arzola, PhD (former DEB Student) Inserogen | November 13 |
| 11:00 AM 1022 LS | GRAMMR Gene Shuffling for Directed Evolution of Protein Function and Expression Yields Hal S. Padgett, Ph.D. CEO & CSO Novici Biotech LLC | November 20 |
| 11:00 AM 1022 LS | Thanksgiving Holiday | November 27 |
| 11:00 AM 1022 LS Evaluations | Harnessing Natural Antibodies to Fight Disease Rena Mizrahi, Ph.D. Senior Scientist GigaGen | December 4 |



with Dr. Judy Kjelstrom) for the wonderful tour and real-world biomanufacturing information provided during the course.



This seminar series is open to the public and will be offered Winter quarter, 2016.

This course is designed to provide a unique opportunity to gain insight into basic and applied biotechnology at the industrial level. Lectures will be presented by senior scientists/engineers from **Novozymes, Inc.** in Davis California. Appropriate for graduate students in all areas of biology, engineering and agriculture, especially those in the Designated Emphasis in Biotechnology Program. MIC 292 is an approved seminar elective for the DEB program.

MIC 292, held every other winter quarter, commences with a tour of the Novozymes site. We are very grateful to the director, **Dr. Debbie Yaver** (co-instructor along

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| 12:10-1:00 PM Room 1022, Life Sciences | <i>Organizational Meeting: Course Overview and Scientific Foundations of Industrial Enzymes</i> (Kjelstrom, Yaver) | Jan 4, 2016 |
| 12:10- 1:00 PM | <i>Discovery of enzymes from nature and improvement of enzymes by protein engineering</i> (Aubrey Jones, Scientist) | Jan 11, 2016 |
| | Holiday No class | Jan 18, 2016 |
| 12:10- 1:00 PM | <i>Bacillus Expression Hosts</i> (Bill Widner, PhD, Staff Scientist) | Jan 25, 2016 |
| 12:10- 1:00 PM | <i>Fungal Expression Hosts and Yield Improvement</i> (Sandy Merino, PhD., Senior Scientist) | Feb 1, 2016 |
| 12:10- 1:00 PM | <i>Development of Bioprocessing Procedures</i> (Audrey Diano, PhD, Group Leader) | Feb 8, 2016 |
| | Holiday No class | Feb 15, 2016 |
| 12:10- 1:00 PM | <i>Enzymology & Application Chemistry of Bioengineered Enzymes</i> (Alex Berlin, PhD, Director) | Feb 22, 2016 |
| 12:10- 1:00 PM | <i>Phylogenomics and synthetic biology as discovery tools in bioenergy applications</i> (Paul Harris, PhD, Senior Staff Scientist) | Feb 29, 2016 |
| 12:10-1:00 PM Evaluations due | <i>Production of chemicals by microorganisms i.e. metabolic engineering</i> (Steve Brown, PhD, Senior Staff Scientist) | March 7, 2016 |
| 12:10-1:00 PM | <i>The Business of Enzyme Production & Future Developments</i> (Debbie Yaver, PhD, Director) | March 14, 2016 |



MARK YOUR CALENDARS: 2016

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| February 15 | Retreat Attendance Forms Due |
| February 22 | Retreat Abstracts & Oral Presentations Due |
| March 5 | 25th Annual Biotechnology Training Retreat in Napa |
| April 16 | Picnic Day: Biotech Event in 148 Briggs Hall |
| April 22 | NIH Biotech Training Grant Fellowship Applications Due |
| May 20 | Annual Teen Biotech Challenge |
| July ~25 - 29 | Flow Cytometry Course |
| August ~8 - 12 | Proteomics Course |



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