

The Biotech Times

An Annual Magazine From the
UC Davis Biotechnology Program

Marianne Hunter, Editor



In this issue

Biotechnology Training Retreat in Napa

Internships

DEB Student Articles

Fall 2013 Issue

A Message From The Director



Back after a brief hiatus in 2012, this edition of the Biotech Times will cover two academic years. In keeping with the experience of most campus programs, the last few years have presented us with unique challenges, as well as new opportunities. As I write this 2013 update message, I am happy to proclaim that the Biotechnology Program is doing very well. We are currently partnering more closely with the Genome Center, the School of Medicine and the Office of Graduate Studies to enhance the graduate experience, as well as interact more effectively with K-14 schools and the life science industry. Although we are always in need of more staff, we continue to grow our successful programs due to our committed Biotech Team: Denneal, Marianne and Jacki. For those of you who knew Demian Sainz, he is now the graduate program advisor for Genetics and Plant Biology. His office is right across the hall, so we continue to work together. We are able to accomplish many of our outreach efforts due to the generosity of our DEB graduate students and affiliated DEB faculty. A shared vision to promote STEM education and serve others are powerful motivators.

The Designated Emphasis in Biotechnology (DEB) program continues to grow in the number of students, faculty and graduate programs. The DEB currently has over 230 PhD students from 30 different disciplines and 140 graduates. We added two new graduate programs last year, Biostatistics and Computer Science, which will be great new partners as we move into the Big Data phase of Biotechnology. We continue to be the largest DE on campus offering a unique pre-doctoral graduate training program that serves as a powerful recruitment tool for the campus. The DEB underwent a Program Review in 2011-12. We received a very positive evaluation, with the Program Review Committee stating that we are one of the **“jewels of graduate education at UC Davis.”** In October 2012, our paper on the DEB and its ecosystem for entrepreneurship, **“The University of California, Davis - Collaborative Model for Biotechnology Education and Training”** was published in the Journal of Commercial Biotechnology. In 2012, our program was also featured in a couple of articles in Science Careers and C&EN, **“Biotech Training Programs Expand Employment Options”** by Clifford Mintz in Science Careers, and **“Closing The Skills Gap”** (Biotech jobs are going begging because new Ph.D.s lack the industry experience that companies want) by Linda Wang from C&EN (Chemical & Engineering News). In 2012, I was asked to serve on the State of California’s Employment Development Department (EDD) - LMI (Labor Market Information) Advisory Board and advise the updated **EDD’s Biotechnology Careers in California** website. Denneal and I were able to add our insights in regards to technical, as well as soft skills, and were cited on the website.

A competitive renewal of the **NIH T32 Graduate Training Program in Biomolecular Technology** was submitted in May 2011 and was funded for another 5 years (2012-2017). It is amazing that we have had this training grant since 1992. The renewal took a lot of hard work to assemble (over 500 pages). A special thanks goes out to Marianne Hunter for her dedication to assembling the many tables. Please see the newsletter for more information on our wonderful fellows. We are so proud of them.

In May 2013, the Biotechnology Program was part of an innovative grant proposal in response to the call: NIH Director’s Biomedical Research Workforce Innovation Award: Broadening Experiences in Scientific Training (BEST). In response to this national need, the University of California, Davis (UC Davis) proposed an

A Message From The Director (Cont.)

innovative new program, **Frontiers of University Training to Unlock the Research Enterprise (FUTURE)** and it was one of 10 proposals which were funded this September (5 year award). Working with the School of Medicine, Graduate School of Management and the Office of Graduate Studies, the Biotechnology Program will build on our trajectory of experience and success to broaden the professional development opportunities offered to biomedical sciences graduate students and postdoctoral researchers. I will direct the Biotechnology Industry Internship part of this grant. PhD students and post-doctoral scientists in this program may earn a **Professional Enhancement Beyond Academia (PEBA) Certificate**.

The **Advanced Degree Program (ADP)** for corporate employees is still growing in its numbers of participants as well as company affiliates. As more companies expand in the region, this program will be a great program for retention of excellent employees, who wish to earn a doctoral degree. The magazine has more details on the participants.

Our community outreach activities keep expanding. The BioTech SYSTEM, Teen Biotech Challenge, Picnic Day Biotech Event, advisory roles for High School Biotech Academies and Science Centers, presentations and campus tours keep us very busy. In February 2012, I was an invited speaker on STEM education for the Annual California Biomedical Innovation Night, sponsored by California Healthcare Institute (CHI) and BayBio. I stressed that our academic institutions need the support of our industry partners. See the [CHI blog](#).



2013 Teen Biotech Challenge volunteers (DEB students)

Since 2012, Denneal and I have served on the Education Action Team for the new PowerHouse Science Center in Sacramento. In addition, I was asked to serve on the Executive Board of Directors so that UC Davis has a strong presence in 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 of one of 10 NSF funded **PopNet (Portal to the Public)** centers in the U.S. for informal science training. I recommended 10

A Message From The Director (Cont.)

PhD students (8 DEB students and 2 HHMI IMBS scholars) to be trained as the inaugural **Science Communication Fellows**. This led to being invited to the **Angels for Hearts** event at the M.I.N.D. Institute. See Donnelly West's article. This fall another cohort of 9 DEB students were chosen. This is a wonderful program for learning how to effectively communicate science to the public.

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 received a 3 year grant in early 2012 to provide 10 TBC winners with a paid summer research experience in stem cell biology. This spring, the School of Veterinary Medicine attended the TBC banquet. They are very anxious to be a sponsor as well as provide paid summer research positions.

As I mentioned previously, Denneal and I continue to become more and more involved in leadership and mentorship issues, especially for women. There is a need for strategic career planning, entrepreneurship and advanced level network development. Over the past two years, I have been part of the Leadership California team who met with delegations of women leaders and entrepreneurs from the developing world at the State Capitol. These women were part of the U.S. Department of State's "100 Women Initiative: Empowering Women and Girls through International Exchanges". It is an honor share our Best Practices in education, technology and business development as well as leadership. Our DEB students have been active too. Kristen Beck was selected to be the lead instructor for **Girls Who Code** this summer. This Intel sponsored program is focused on recruiting more women in computer science. Jeni Lee and Nicole Chaffee have done a fantastic job in organizing the **Women in Leadership** (WiL) series this fall. In partnership with the Biotechnology Program, the UC Davis ADVANCE Program, AWIS and other groups, we hope to raise awareness of the issues of equity for women, especially in the STEM fields. Read more about this in the newsletter.

With warmest wishes,

Dr. Judy Kjelstrom



Biotechnology TIMES

An Annual Magazine From the
UC Davis Biotechnology Program

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NIH-NIGMS TRAINING PROGRAM IN BIOMOLECULAR TECHNOLOGY BIOTECHNOLOGY TRAINEE FELLOWSHIP RECIPIENTS



Kristen Beck



Nicholas Bokulich

Congratulations to the outstanding students who were selected as the 2013-2014 NIH and Biotech Fellows. There were 33 fellowship applicants this year and all were exceptional candidates!

NIH

Kristen Beck, Biochemistry, Molecular, Cellular & Developmental Biology (Ian Korf, Preceptor). Novel Methods in Proteomics and their Application to the Comparison of Primate Milks

Nicholas Bokulich, Food Sciences (David Mills, Preceptor). High-Density Biosurveillance of the Food Processing Chain Built Environment

Casey Boosalis, Molecular, Cellular & Integrative Physiology (Randen Patterson, Preceptor). Mixed Population Neurochips: Improving Learning and Memory

Jennifer Lee, Biomedical Engineering (Kyriacos Athanasiou, Preceptor). A Modular Approach to Articular Cartilage Engineering With Human Embryonic Stem Cells

Amelia Manlove, Chemistry (Sheila David, Preceptor). Synthetic DNA Base Analogs Demonstrate Surprising Substrate Requirements for MutY-Mediated Repair in Cells

Abigail Yu, Genetics (Ian Korf/David Segal, Preceptors). Using Artificial Transcription Factors as Novel Tools for Malaria Treatment



Jennifer Lee



Amelia Manlove



Abigail Yu



Siobhan Halloran

Biotech

Christopher Chapman, Biomedical Engineering (Erkin Seker, Preceptor). Engineering the Neuron-Electrode Interface for Advanced Drug Screening Platforms

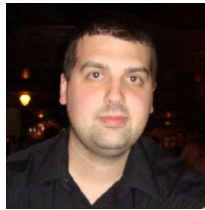
Siobhan Halloran, Chemical Engineering (William Ristenpart, Preceptor). Airborne Disease Transmission Via Expiratory Aerosols

Allison Hoch, Biomedical Engineering (J. Kent Leach, Preceptor). Novel 3D Bioreactor Expansion of Bone Marrow Aspirate Preserves Stemness and Multipotency of Mesenchymal Stem Cells

Keith Dunaway, Genetics (Janine LaSalle, Preceptor). Epigenomic Effects of Persistent Organic Pollutants



Allison Hoch

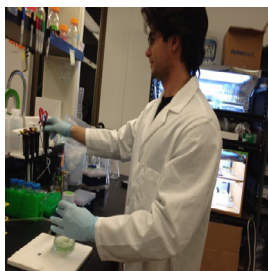


Keith Dunaway

Not Pictured: Casey Boosalis,
Christopher Chapman



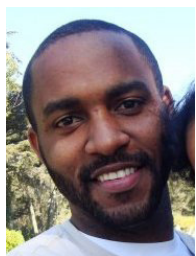
NIH-NIGMS TRAINING PROGRAM IN BIOMOLECULAR TECHNOLOGY BIOTECHNOLOGY TRAINEE FELLOWSHIP RECIPIENTS (CONT.)



Gabriel Rodriguez



Jennifer Lee



Brandon Brown



Amelia Manlove



Abigail Yu



Alan Lombard



Siobhan Halloran



Kristen Beck



Jesse Bakke

Listed below were the 2012-13 NIH/Biotech Fellows that were stellar examples of graduate researchers!

2012 – 2013 NIH/Biotech Fellows

Gabriel Rodriguez, Chemistry (Shota Atsumi, Preceptor)
Jennifer Lee, Biomedical Engineering (Kyriacos Athanasiou, Preceptor).

Brandon Brown, Pharmacology & Toxicology (Heike Wulff, Preceptor)

Amelia Manlove, Chemistry (Sheila David, Preceptor)

Abigail Yu, Genetics (Ian Korf/David Segal, Preceptors)

Alan Lombard, Biochemistry, Molecular, Cellular & Developmental Biology (Maria Mudryj, Preceptor)

Siobhan Halloran, Chemical Engineering (William Ristenpart, Preceptor)

Kristen Beck, Biochemistry, Molecular, Cellular & Developmental Biology (Ian Korf, Preceptor)

Jesse Bakke, Nutritional Biology (Fawaz Haj, Preceptor)



BIOTECHNOLOGY INTERNSHIPS, MCB 282



Left: Dr Judy likes Herb and Bob's ideas

Right: University of Genentech

One of the requirements to receiving a Designated Emphasis in Biotechnology 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 (MCB 282) and several have started this fall.

We wish to thank all of our industry partners who offered internships for our DEB students. The following students have recently completed their internships in the 2011-12 and 2012-13 academic years:

2012-13 Academic Year

Amyris (Emeryville, CA): James (Mitch) Elmore

Aqua Bounty (MA): Caitlin Cooper

Biomarin Pharmaceuticals (Novato, CA): Charity Onore

The Buck Institute (Novato, CA): Barbara Bailus

Celgene (San Francisco, CA): Astra Chang, Crystal Berger

Contra Costa College (Contra Costa, CA): Priashiela Singh

Dairy Research Institute (Chicago, IL): Elieke Demmer

Genencor (Palo Alto, CA): Rena Mizrahi, Richard Osibanjo

Genentech (S. San Francisco & Vacaville, CA): Jesse Bakke, Roberto Barrozo, Diana Lac, Daniël Melters,

Jared Moore, Alice Ngo, Amy Schroeder, Chelsea Snyder, Nancy Zeng

Heretic Brewing (Fairfield, CA): Johnathan Hughes

Igenica (Burlingame, CA): Anna Erickson

Innovation Access, Office of Research (UC Davis, CA): David Olivos

Marrone Bio Innovations, Inc. (Davis, CA): Geetika Joshi

Monsanto, Celgene (Davis, CA): Anand Surendrarao Rao, Barbara Blanco-Ulate

Novozymes, Inc. (Davis, CA): Marissa Hirst, David Woessner

Nunhems USA, Inc. (Davis, CA): Fei Yian Yoong

Office of Research (UC Davis, CA): Mitch Harkenrider

OncoMed (Redwood City, CA): Dipali Patel

School of Med (UC Davis, CA): Mary Saunders

Stryker Corp. (Kalamazoo, MI): Michelle Tu

Sutro Biopharma (San Francisco, CA): Elenor Castillo

Texas Instruments: Tang Tang

Thien Sinh JSC Research and Development Center (Ho Chi Minh City, Vietnam): Karen LeGrand

University Hospital Basel (Basel, Switzerland): Allison Hoch

BIOTECHNOLOGY INTERNSHIPS, MCB 282 (Cont.)



National University of Ireland, Maynooth and Novozymes (Davis site)

2011-12 Academic Year

Agilent (Santa Clara, CA): Shuai Wu

Bayer (Berkeley, CA): Raquel Orozco-Alcaraz

BioMarin (San Rafael, CA): Dawn Fedor

Burrill & Company (San Francisco, CA): Zane Starkewolfe

CHI (CA Healthcare Institute, Sacramento, CA): Sarah Lockwood

CBST (Center for Biophotonics Science & Technology, UC Davis): Padmini Sirish

Celgene (San Francisco, CA): Erin Schwartz

Cytokinetics (San Francisco, CA): Darren Hwee

G-Con (College Station, Texas): Kittipong Rattanaporn

Genentech (San Francisco, CA): Neha Dixit, Rashida Lathan, Thomas Luu,

Maria Olubunmi Ogunyankin Marques, Joseh Ramahi, John Strum, Ambrose Williams

Isador Cohen School (Sacramento, CA): Nathaniel Kingsbury

NIBRT (National Institute of Bioprocess Research & Training, Dublin, Ireland): Michelle Lozada Contreras

National University of Ireland (Maynooth, Ireland): Lucas Arzola

Nestle (Switzerland): David Dallas

Novozymes (Davis, CA): Shannon Ceballos, Tiffany Glavan, Tu Anh Huynh

Sandia National Lab (Livermore, CA): Sean Gilmore

OncoMed (Redwood City, CA): Laura Hoang, Vu Trinh, Breanna Wallace

Pfizer (New Jersey): Zahra Kedri

Prozymes (Hayward, CA): Danielle Aldredge

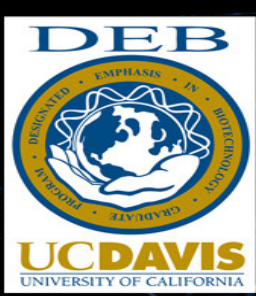
Professors for the Future (School of Ed, UCD): Collin Ellis 201005

Takeda (San Francisco, CA): Charles Nwosu

Texas Instruments: Erin Fong

University of Alabama (Birmingham, Alabama): Stephanie Crockett

University of Dublin (Dublin, Ireland): Rachel Kerwin



Designated Emphasis in Biotechnology Program (DEB)

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 currently 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 the conduct of 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.
- 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 a qualification in biotechnology.

Course requirements are covered on the [DEB website](#).



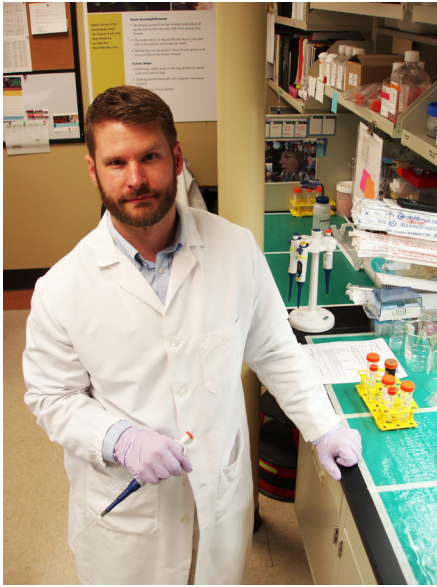
Top: Amelia Manlove, JohnPatrick Rogers, Prof. Sheila David
Below: Prof. Bill Ristenpart, Nancy Zeng, Siobhan Halloran



Top: Chris Chapman, Ozge Kurtulus, Prof. Erkin Seker, Pallavi Daggumati
Below: Kateryna Feoktistova, Brian Avanzino, Prof. Chris Fraser, Nick Mahoney



“QUANTIFYING THE INTANGIBLE” by Johnathon Anderson (DEB Executive Committee - Student Representative)



As we hiked down the boulder laden, angular face of a waterfall tucked away in the Sierra Nevada mountains, some of us took our time as we soaked in the postcard-esque views. Not Joe. Joe was a quiet guy and admittedly socially awkward, but he was a natural born athlete, eager to explore. After several minutes of calling out, in between our gasps for air, Joe slowed down enough for us to catch up to him to take quick break. Jill, despite not knowing Joe that well, wasted no time making her way to him and letting him know that leaving the group's sight was not only inconsiderate, but dangerous as well. Joe agreed to take it down a notch. About fifteen minutes into the next leg of the hike, a large rock gave way that bloodied and twisted Joe's ankle into a swelling mess. Joe started freaking out. Jill stayed calm, pulled out what seemed like a small suitcase-sized first aid kit and went to work. Lucky for Joe, Jill was an experienced nurse. Joe got out of there just fine and perhaps learned something that day.

Most scientists grow up being the smart one of the class as a child. This perhaps helps to shape our thinking in more ways than one. We end up receiving a lot of praise for flexing the calculating side of our intellect in productive ways; exam scores, scholarships, data generation in a lab. These things are easily quantifiable and easily incorporated into a CV. Yet, there is more than one type of intelligence and getting “ahead” is rarely achieved in solitude, contrary to what we learn in the earlier parts of our academic careers. No place is this more evident than in biotech companies where teams with diverse expertise have to come together and try to develop safe, efficacious and federally approved products in a cost, time and litigation efficient manner.

What class do I take to learn to work and communicate with a diverse range of people on multiple levels, building relationships on trust? What would that test look like? How do I quantify my results?

If you don't pay close attention, the DEB sort of Mr. Miyagi's you (Karate Kid reference “paint the fence”, etc). Sure, the DEB offers you coursework to expose you to the many concerns that a biotech company contends with that extend beyond the laboratory. But in all honesty, the reason I most often hear that students join the DEB is the lure of a potential industry internship, if they succeed in playing their cards right. Yet, this isn't the genius of the DEB; that takes a little more personal reflection and engagement. The genius of our Designated Emphasis in Biotechnology program is that it offers the thoughtful student an opportunity to achieve something that ambitious students from other well regarded research universities envy.

Sometimes when I try to tell new and perspective grad students about these less tangible things, they don't always get it. If you wanted to learn how to truly explain your research to a naïve audience (eg lawyer, businessman) in a manner where they viscerally “get it”, where would you go? If you wanted to take a personal tour of a thriving local biotech company to learn more about what its corporate culture, who would you talk to? If you wanted to have lunch with the CEO of your favorite biotech company so you could get

“QUANTIFYING THE INTANGIBLE” (Cont.)

some one on one time to talk with him, how would you talk him/her into this? If you thought that your research could have a great real-world application, how would you start building your team and developing a business plan? If you wanted to reach across traditional research disciplinary boundaries to cross pollinate some ideas, where would you start? If you had a great idea for how to help make your program better (eg seminar, workshop, benefit), who would you turn to for support?

All of these career development questions I just asked have at least two things in common. One, these are opportunities that are only open to you if you have the drive to actively pursue things that ring true to your passions. The DEB doesn't require that you do any of these things I've alluded to. They simply hold out a hand and say, "Let me know how I can help." I'd like to argue that this is a luxury that sharp, ambitious students around the globe pine for.

The second thing that these questions have in common is that they ostensibly speak to your self-interests. But perhaps the most rewarding experience that the DEB can offer you, is allowing you to give part of your time and energy back to the community. It's the look of wonder when a child, teenager or adult gets to extract and visualize DNA from fresh strawberries. It's the firm hand shake you get when someone is touched by the promise that your research holds for their future. It's the email thanking you for taking the time to help mentor a high school student, who maybe wasn't having the easiest time in the world with life right at that moment. It's not easy to quantify some of the intangibles qualities that the DEB instills, like personal growth. But when you shake hands during your next interview and start to show them the person behind the science that you've become, you might be surprised just how valuable all of these intangible qualities can truly be.

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Johnathon Anderson



BIOTECHNOLOGY TRAINING RETREAT

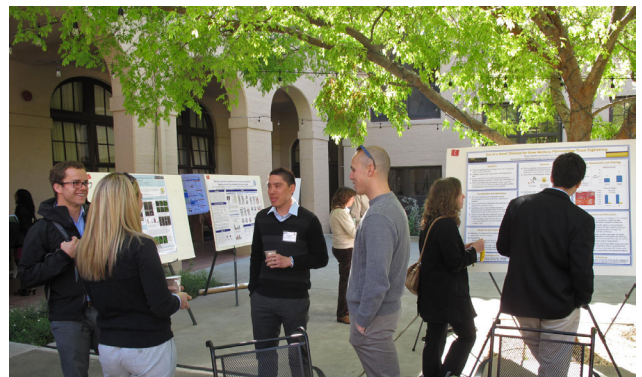
This past May, 2013, the Biotechnology Program held their 22nd annual Training Retreat for fellowship recipients and their mentors, industrial affiliates and our DEB students and faculty members. The retreat is held each Winter or Spring Quarter at Christian Brothers Retreat and Conference Center in the Napa Valley. At the retreat, the fellows and the industry affiliates give 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. We were thrilled to have **Vice Chancellor of Research, Harris Lewin** and **Associate Vice Chancellor of Research, Paul Dodd**, join us at this year's retreat!



Pictured above are 2012-13 NIH and Biotech Fellows: L-R: Jennifer Lee, Kristen Beck, Abigail Yu, Alan Lombard, Jesse Bakke, Brandon Brown, Amelia Manlove, Gabriel Rodriguez, and Siobhan Halloran



Martina Newell-McGloughlin (Co-director Training Grant), David Segal (Assoc. Dir. Genomics), VC Harris Lewin, and AVC Paul Dodd,



Poster session of the Biotech Retreat

CONGRATULATIONS TO RECENT DEB GRADUATES!

Throughout the 2012-2013 academic year, there were many students in the **DEB Program** who received their PhDs 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.

Remember – the DEB has a LinkedIn Graduate Group

Remember - Please take a moment to register on the U.C. Davis Biotechnology Career Network so that you can have access to these great resources!

Crystal Berger – PhD in Biochemistry, Molecular, Cellular & Developmental Biology, now a Technical Support Specialist for Molecular Devices

Astra Chang – PhD in Comparative Pathology

Dawn Chiniquy – PhD in Plant Biology, now a post-doc at UC Berkeley's Plant & Microbial Biology department.

David Dallas – PhD in Nutritional Biology, now a post doc with the USDA NIFA AFRI program

Collin Ellis – PhD in Nutritional Biology

Dawne Fedor – PhD in Nutritional Biology

Prasad Gawande – PhD in Chemistry, is a scientist at a private biotech company.

Tiffany Glavan – PhD in Microbiology, now a Scientist of Molecular Diagnostics at IntelligentMDX, Cambridge, MA

Dmitry Grapov - PhD in Agricultural & Environmental Chemistry, now a post-doc in Metabolomics and Bioinformatics at UC Davis

Scott (Oldham) Hamilton – PhD in Biochemistry, Molecular, Cellular & Developmental Biology, is a management consultant in the Stockton area.

Tu Anh Huynh – PhD in Food Science, is a post-doc at the University of Washington

Darren Hwee – PhD in Molecular, Cellular & Integrative Physiology now a post-doc at Cytokinetics, Inc.

Rashida Lathan – PhD in Animal Biology, now a post-doc at the Institut Pasteur, Dept of Mouse Genetics, in Paris, France

Cheng Yuk Lee – PhD in Chemical Engineering, now working as a scientist at ReLIA Diagnostic

Sarah Lockwood – PhD in Biochemistry, Molecular, Cellular & Developmental Biology, is a post-doc at UC Davis Genome Center

Kristina Mahan – PhD in Biochemistry, Molecular, Cellular & Developmental Biology

Daniël Melters – PhD in Biochemistry, Molecular, Cellular & Developmental Biology, now a post-doc in Shiv Grewal's lab at the NIH/NCI

Charles Nwosu – PhD in Chemistry, accepted a position with Pharmaceutical Product Development (PPD), WI

Maria Olubunmi Ogunyankin Marquez – PhD in Chemical Engineering, now a post-doc at the University of Minnesota

Raquel Orozco-Alcaraz – PhD in Chemical Engineering, is an engineer at Boehringer Ingelheim in Fremont, CA

Joseph Ramahi – PhD in Biochemistry, Molecular, Cellular & Developmental Biology, now a post doc Research Associate at Saint Jude Children's Research Hospital

Kittipong Rattanaporn – PhD in Chemical Engineering, now working as an intern at Caliber Biotherapeutics, LLC, Davis CA

Erin Schwartz – PhD in Biochemistry, Molecular, Cellular & Developmental Biology, is now a post-doc at Stanford University

John Strum – PhD in Chemistry, now an analytical chemist at OSHA

Shuai Wu – PhD in Chemistry, now a scientist at DVS Sciences Inc.

THE ADVANCED DEGREE PROGRAM FOR CORPORATE EMPLOYEES (ADP)

The **Advanced Degree Program for Corporate Employees (ADP)** is an innovative 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. This year the Immunology Graduate Group was welcomed as a new affiliate. 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.

Current ADP Participants and Mentors:

- **Daniel Bedinger** (MCIP Graduate Group) and **Marina Roell, PhD** (Xoma, LLC, in Berkeley). UC Davis mentor: Professor Sean Adams.
- **Brooks Hayes** (CDB Graduate Group) and **Thera Mulvania, PhD** (Expression Systems, Inc. in Woodland). UC Davis mentor: **Professor Bruce Hammock**, Entomology
- **Shaunese Lambel** (Genetics Graduate Group) and **Eileen Kabelka, PhD** (Harris Moran Seed Co., in Davis). UC Davis mentor: **Professor Roger Chetelat**, Plant Sciences.

Congratulations go to: Meiye “Mei” Wu (BMB Graduate Group) who received her PHD in 2013 and **Steven Branda, PhD** (Sandia National Labs in Livermore). UC Davis mentor: **Professor Kit Lam** (Chemistry & School of Medicine).



Top L-R: Judy Kjelstrom & AVC Dushyant Pathok, AVC Paul Dodd & Martina Newell-McGloughlin
Bottom L-R: Spyros Tseregounis and Dean Hildreth, Kristen Bennett(Monsanto) & Feng Xu(Novozymes)

BIOTECHNOLOGY EVENT AT PICNIC DAY



Left: Dr. Denneal Jamison-McClung & Dr. Judy Kjelstrom (Biotech Program)

Right: Barbara Bailus (blue shirt), Michelle Tjahjadi (yellow shirt)



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 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.





WOMEN IN LEADERSHIP SEMINAR SERIES

FALL 2013

Written by:
Nicole Chaffee, PhD Student, Chemistry with a
Designated Emphasis in Biotechnology

Jeni Lee, PhD Student, Biomedical Engineering with a
Designated Emphasis in Biotechnology

(In consultation with Dr. Judy Kjelstrom, Director,
UC Davis Biotechnology Program)



The year of the woman is upon us and much attention is focused on global issues of oppression and lack of access to education—films like *Girl Rising* and *Half the Sky* emulate these struggles seen throughout the globe. Here in the United States, we are experiencing our own battle for gender equity, as described in Sheryl Sandberg's *Lean In*. This year, Gloria Steinem will be honored with the Presidential Medal of Freedom for her impact as a leading activist during the women's liberation movement of the 1960s and beyond. Ideas of gender imbalance continue to span the decades, with current generations still seeing gender inequality in positions of leadership. For example, more women earned PhDs than men in 2010, yet male faculty members earned an average of \$87,206 while their female counterparts made \$70,600 in the 2009-10 academic year (Washington Post). Of the Fortune 500 companies, women hold less than 5% of the CEO positions (Catalyst.org).

Inspired to address these issues, we consulted with Dr. Judy Kjelstrom (Director, UC Davis Biotechnology Program) and partnered with the UC Davis Biotechnology Program, the Chancellor's Office, UC Davis ADVANCE (Advancement of Women in Academic Science and Engineering Careers) Program, the Women's Resources and Research Center (WRRC), the Office of Campus Community Relations (OCCR), and the Sacramento Valley Chapter of the Association for Women in Science (AWIS) to offer a Women in Leadership Seminar Series during the fall quarter of 2013. The series consisted of film showings of *Girl Rising*, *Half the Sky*, and *Makers: Women Who Make America*, aimed to highlight global issues in gender disparity, demonstrate what seized opportunities can mean for young girls, and illustrate the rise of female leaders. Before each film showing, we seed questions for the audience, to be discussed after the film.

Finally, the series will culminate in a panel session of extraordinary female leaders from academia, industry, and government, who will discuss the challenges and rewards of being a successful female leader. Our six exceptional panelists are: Linda Katehi, Chancellor, UC Davis; Maureen Stanton, Vice Provost Academic Affairs, UC Davis; Meg Arnold, CEO, Sacramento Area Regional Technology Alliance (SARTA); Constance McKee, CEO, Manzanita Pharmaceuticals; Lois Wolk, Senator, California State Senate; and Michele Wong, CEO, Synergex and CleanWorld.

Especially as women in science, technology, engineering, and math (STEM) fields, we have personally experienced instances of gender inequality. Armed with astounding data and inspirational stories, our overall objective for the series is to educate, advocate, and inspire women by setting the stage for in-depth discussions regarding issues of gender equity. We encouraged both women and men to join in this dialogue about gender rights, as facilitating meaningful discourse will not only encourage men to embrace their female counterparts as fellow leaders, but importantly, will empower young, bright females to pursue leadership roles. From our experience in organizing the Women in Leadership Seminar Series, we have learned to appreciate the enormity of these issues and the thirst our colleagues have for more information, as well as their desire to reach out and give back. We believe that increasing the number of women in leadership positions will ensure the presence of a female voice and will set positive examples for future generations. We hope the Women in Leadership Seminar Series will continue past its inaugural year, to push the community towards a truly equal future!

GIRLS WHO CODE PROGRAM

The “Girls Who Code” program is an organization that arose in 2012. It is a nationwide non-profit aimed at closing the gender gap in technology by inspiring and educating girls between the ages of 13 to 17 in computing science. The program began June 24th and is funded by Intel Foundation and Intel Corp. Now in its second year nationally (this is the first year at UC Davis), Girls Who Code help to educate and provide resources for these young women so that they may pursue career opportunities in computing.

Thanks to Dr. Raymond Rodriguez, a professor of molecular and cellular biology and currently the director of the Global HealthShare Initiative at UC Davis, the Girls Who Code program came to our campus, making UC Davis the first university site. Professor Rodriguez is a DEB faculty trainer and currently teaches two of the mandatory DEB courses, MCB 263 (Biotechnology Fundamentals and Applications) and MCB 294 (Co-instructor, Current Progress in Biotechnology Seminar). Professor Rodriguez and the Global HealthShare Initiative are also working on a similar program in collaboration with an agricultural college in India.

This past summer, twenty girls were selected to participate in the eight week Girls Who Code Summer Immersion Program at UC Davis. The girls received intensive instruction in computer science fundamental, robotics, mobile web app development, and website development and design. Kristen Beck, a third year DEB Biochemistry, Molecular, Cellular and Developmental Biology PhD student, donated two months of her time to inspire the Girls Who Code participants in over 320 hours of classroom instruction. Kristen is currently an NIH Biotechnology Fellow as well as a Science Communications Fellow for the Powerhouse Science Center.

The motive and rewards of increasing STEM education for girls are vast:

“Women represent 12% of all computer science graduates. In 1984, they represented 37% of all computer science graduates.”

“I’m capable of doing things I never thought I could do. I’m motivated to start my own company. I want to make a difference in my community.” - Diana, 16

“This is more than just a program. It’s a movement.” - Reshma Saunjani, Founder, Girls Who Code

“We have a crush on Girls Who Code!” - Glamour Magazine

To learn more, you can visit the Girls Who Code website at: <http://www.girlswhocode.com/>.





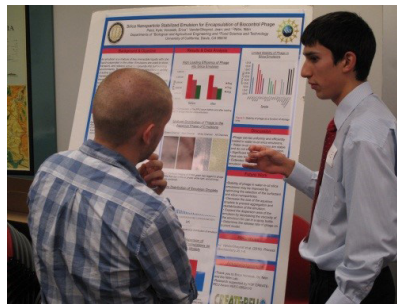
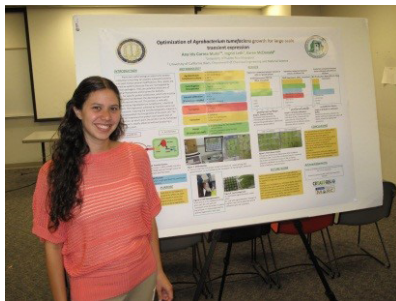
NSF CREATE-IGERT NEWS by Denneal Jamison-McClung, Associate Director

The NSF CREATE-IGERT is in its final year of funding and will finish in 2014.
<http://create-igert.ucdavis.edu/>

The NSF CREATE-REU site program in plant biotechnology came to a close during the summer of 2012. In all, we hosted a diverse group of 26 undergraduate researchers over the course of three summers, ultimately recruiting 4 transfer students and 4 doctoral scholars to UC Davis (~30%). Special thanks to PI Jean VanderGheynst, Co-PI Pam Ronald, lab instructor Dr. Larry Joh, RA's (Kayan Tam, Samantha Leung and Elenor Castillo), and research mentors across the plant sciences and engineering, including DEB/grad students (E. Castillo, Y.S. Cheng, R. Gustafson, B. Higgins, A. Hildebrand, M. Lemos, I. Leth, P. O'Dell, K. Rattanaporn, E. Vonasek, N. Worden) and scientists (P. Canlas, M. SantaMaria, M. Sharma, R. Sharma, F. Rezaei, R. Ruan, E. Szewczyk). CREATE-REU laboratories included the following DEB faculty: D. Beckles; J. Fan; O. Fiehn; K. Dehesh; G. Drakakaki; B. Jenkins, T. Jeoh; J. Labavitch; K. McDonald; F. Negre-Zakharov; N. Nitin; P. Ronald; and J. VanderGheynst. <http://create-reu.ucdavis.edu/>



2010-11 CREATE-REU Alumni



2012 Poster Session



NSF CREATE-IGERT NEWS (Cont.) by Denneal Jamison-McClung, Associate Director

In 2014, we will be wrapping up the seventh year of the CREATE-IGERT doctoral training program in plant biotechnology (<http://create-igert.ucdavis.edu>) at UC Davis and Tuskegee University. Of 27 trainees, we have 8 PhD graduates, 3 MS graduates (with 2 continuing as current PhD trainees). We expect 18 additional doctoral graduates over the next few years. In July 2013, we were pleased to hear that a member of our first cohort of trainees, Chris Simmons, PhD, had accepted a UC Davis faculty position in Food Science and Technology. We've recently welcomed Prof. Simmons as a member of our DEB faculty – full circle!

As a capstone training activity, eight doctoral trainees and three faculty recently traveled to Ireland to participate in a summer short course on GM crop regulations and food technologies with partner hosts and institutions, including: Prof. Charlie Spillane at NUI Galway; Prof. Fergus Shanahan at University College Cork; Dr. Ewen Mullins at Teagasc Oak Park Research Center; Prof. Dave McConnell at Trinity College; and Prof. Jim Burke at University College Dublin.





BIOTECH SYSTEM NEWS by Denneal Jamison-McClung, PhD



Directing the BioTech SYSTEM brings me into contact with dedicated teachers, curious students and some of the most generous industry scientists and business people one could hope to meet. Our mission as a consortium is to bring the knowledge created at the university to California's K-14 classrooms, aiming to educate, inspire and encourage the next generation of scientists and engineers. With zero cash in the coffers at the start of each academic year, I am always amazed at what we can do through the volunteer spirit and generosity of the greater biotech community.

We certainly would not accomplish much without the help of our DEB graduate student volunteers, the undergraduate BioBoosters Club and the undergraduate Biotechnology Club. These early career scientists and engineers bring the excitement of research and discovery to middle school and high school students through BioTech SYSTEM activities, including: **Biotech Tour Days**, **E-mentoring**, **Career Fairs**, the **Biotech Expo** poster competition and the annual **Teen Biotech Challenge (TBC)** web design competition.

Biotech Tour Days

In 2011-2012 and 2012-2013, we introduced **over 350 Northern California students** to campus and the "culture of research science". On a typical tour day, I give teachers and students a seminar on the latest and greatest in biotech research, with the occasional "College of Biological Sciences Jeopardy!" game hosted by the BioBoosters. After the seminar, students and teachers break up into small groups for personalized walking tours led by DEB volunteers. We reconvene for lunchtime at the CoHo, which provides a glimpse into campus life. The visit is eye-opening for many students and is often their first exposure to laboratory science in a university setting. Visiting schools and youth programs over the last two academic seasons have included a diverse mix from across Northern California: American Canyon HS (Napa); Antelope HS; Benicia HS; Rodriguez HS (Fairfield); Huckleberry Youth Program (San Francisco); Piner HS (Santa Rosa); Sheldon HS (Elk Grove); Colusa HS; and Enochs HS (Modesto).

E-Mentoring & Career Fairs

Mentoring is a great skill, whether pursuing a career in academia or industry. Through e-mentoring and career fairs, we call upon DEB students to 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. Annual e-mentoring efforts are undertaken through the **Cordova Cyber Buddy Program**, the **Sheldon HS Biotech Academy**, and the **Vallejo HS Biotech Academy**. Annual career fairs include **Douglass MS** (Woodland), **Einstein MS** (Sacramento), **Lee MS** (Woodland), **Hiram Johnson HS** (Sacramento) and the regional **Expanding Your Horizons** event for 5th and 6th grade girls, held at Sacramento State University. In 2012, we were also invited by Prof. Mitch Singer to participate at the **Festival de Ciencias**, a great event to introduce hands-on science to primary students at Chavez Elementary School (Davis).

Teen Biotech Challenge & Biotech Expo

The Teen Biotech Challenge is a web design competition for high school students, with annual participation of ~400 high school students across ~20 California high schools. Students are asked to research a topic and develop an education webpage in one of seven biotech focus areas: Agricultural Biotechnology; Computational & Systems Biology; Drug Discovery & Biomanufacturing; Environmental Biotechnology; Nanobiotechnology; Personal Genomics & Human Health; and Regenerative Medicine. In 2013, over 430 students from 21 California high schools participated in TBC.

Thanks to the on-going support of **Community Sponsors** (Bio-Rad, DCA Partners, Ernst & Young LLP, HDR Architecture, ioSafe, Dan Koellen, Monsanto, Roger Niello, Novozymes, North Valley Biotech Center at American River College, Gary Simon, Synergex, Velocity Venture Capital, WorldBridge Partners) and **Event Partners** (Genentech, Chevron, Rotary Club of Sacramento, SARTA, UC Davis Biotechnology Program), we were able to host the TBC Awards Banquet & Symposium, and provide over \$10,000 in cash prizes and awards to participants in 2012 and 2013.

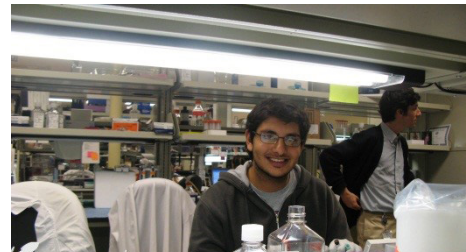
BIOTECH SYSTEM NEWS (Cont.) by Denneal Jamison-McClung, PhD



Twenty TBC 2012 and TBC2013 winners were selected to participate in a stem cell biology summer research program funded by the **California Institute of Regenerative Medicine Creativity Award** and offered through the **UCDMC Institute for Regenerative Cures (PI – Gerhard Bauer)**

Left: TBC Awards Banquet at Freeborn Hall

Below: Teens interning at UCDMC Institute of Regenerative Cures and lastly, the 2013 CIRM Poster Symposium (San Francisco)



In 2012, the Biotech Expo poster competition hosted ~80 Northern California middle school contestants from Einstein MS (Teacher - Yong Lor, Sacramento) and Mistletoe School (Teacher – Jana Hult, Redding). Poster entries included topics in Ag Biotech, Biofuels, Biomanufacturing, Biomedical Engineering & Nanotechnology, Forensics and Stem Cells. While posters were judged and awarded, the middle school students participated in a biotech seminar, campus tours and enjoyed a pizza dinner (kindly provided by the North Valley Biotechnology Center at American River College). Thanks to the UC Davis undergraduate Biotechnology Club for helping to organize and judge the Biotech Expo Middle School Poster Competition in 2012.

(**Note:** Unfortunately, Biotech Expo was shelved in 2013 due to lack of resources and bandwidth...but, if/when I figure out how to clone myself and grow money on trees... it may rise like a phoenix from the ashes...)

Personal Genomics Workshop for Educators

One of the best ways to disseminate the information on the latest scientific discoveries is to keep secondary and post-secondary teachers up to speed. Thanks to a generous contribution by **David Hedin of Expressions Systems**, we were able to offer a “train-the-trainers” Personal Genomics Workshop for Educators for ~20 regional secondary and post-secondary life science instructors in 2012 and 2013. Over the course of 3 days in July, I introduced participants to free online genomics tools, open access primary literature, the use of social media in the classroom and related resources (NCBI, ClustalW, PLOS, Twitter, 23andme, etc...). Together we developed and beta-tested new activities and story-centered curricula tailored to instructor classrooms. The course is free of charge to regional life science teachers and will be offered again in summer 2014 (July 17-19th).

SCIENTISTS, IMPOSTERS AND THE FUTURE

by Donnelly West, DEB Genetics PhD Student

When it comes to science, mediocre classes and misleading news articles abound, but facilities like Powerhouse Science Center in Sacramento boost opinions on science and technology every day. I had the good fortune of participating in a National Science Foundation program called, “Portal to the Public”, entailing a series of workshops on addressing the public and ‘translating’ research into simple, approachable concepts.



If you're like me, then you love data, and studies have shown that when real experts give answers and facts directly to the public, it increases curiosity and decreases fear and uncertainty about research. As a graduate student, I have struggled with research setbacks and the fear of inadequacy (often referred to as Imposter's Syndrome) but participating in programs like Portal to the Public resets my calibration for how exceptional scientific research truly is. Furthermore, considering the discrepancy between scientific coursework and research reality, enticing future generations to explore and innovate must be encouraged outside of the classroom.

Outreach opportunities like this lead to other networking and educational opportunities and prevent researchers from stifling their own creativity by succumbing to intellectual isolation. Portal to the Public, therefore, serves not just the public but also the greater scientific community by improving public perceptions of science and encouraging present and future scientists.

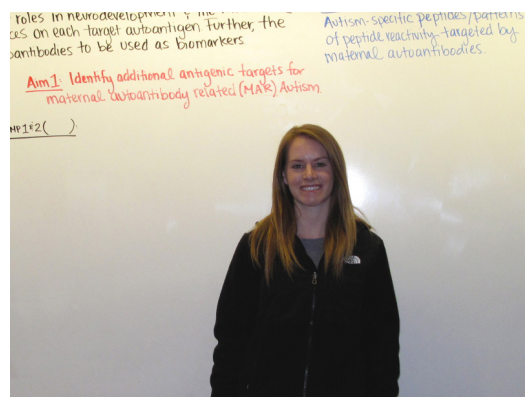


DEB PIZZA CHALK TALKS

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 2013-2014 **Chalk Talks** scheduled.

Chalk Talks are strictly for DEB Students and Faculty members.

- Oct. 9, Elizabeth Fox, Immunology
Mentor: Prof. Judy Van de Water
- Oct. 23 Marjannie Eloi Akintunde
Mentor: Prof. Judy Van de Water
- Nov. 6 Lisa Anderson, Chemistry
Mentor: Prof. Annaliese Franz
- Nov. 20 John Uhrig, Microbiology
Mentor: Prof. Angie Gelli
- Jan. 15 Gordon Walker, Biochemistry, Mol, Cell & Dev. Biology
Mentor: Prof. Linda Bisson
- Jan. 29 Emily Mills,
Mentor: Prof. David Pleasure
- Feb. 12 Kevin Martin, Chemistry
Mentor: Prof. Jared Shaw
- March Gabriel Rodriguez, Chemistry
Mentor: Prof. Shota Atsumi
- April 9 Siobhan Halloran, Chemical Engineering
Mentor: Prof. Ristenpart
- April Candace Burke, Immunology
Mentor: Prof. Lisa Miller
- May 7 Anna Erickson, Biochemistry, Mol, Cell & Dev. Biology
Mentor: Prof. Andrew Fisher



Elizabeth Fox, Immunology

All DEB students are encouraged to present one chalk talk.

BIOTECH SEMINAR SERIES (MCB 294)



Left: Judy Kjelstrom with Kimberly Barnholdt (23andMe)



Right: Rachel Chickwamba (CSIR)

One of the DEB course requirements is the successful completion of at least two quarters of MCB/ECH 294 (Current progress in Biotechnology Seminar Course). This seminar course is also open to the public. Here is a brief summary of the lecturers for fall quarter (held in 1022 LS from 11:00 am – noon).

2013 Fall Seminars

September 27 Organizational Meeting

Dr. Judy Kjelstrom (Biotechnology Program & DEB program coordinator)

Prof. Karen McDonald (ECH) – (instructor)

Prof. Ray Rodriguez (MCB) – (instructor)

October 4 Big Bang Kickoff

Niki Davisson – Program Manager, UC Davis Child Institute for Innovation and Entrepreneurship

Edward Silva – Program Coordinator, Sustainable AgTech Innovation Center, UC Davis

ViVita Presentation (2012 Big Bang! Winning Team), Maelene Wong, Jeni Lee and Gina MacBarb

October 11 Towards a Sustainable Future with Industrial Biotechnology

Boonchai Boonyaratanakornkit, PhD Fermentation Engineer, Dupont UCD Alum

October 18 Immunotherapy of Cancer

Jim Breitmeyer, M.D., Ph.D., President, Bavarian Nordic, Inc.

October 25 Life sciences: Are we all social impact investors now?

Constance McKee, MBA, President & CEO, Manzanita Pharmaceuticals, Inc.

November 1 An Aggie Biochemist who Went to Law School Answers: How Are Biotech Discoveries Patentable?,

Shane Smith, PhD, Associate, McDermott Will & Emery LLP UCD Alum

November 8 A Metabolomics Approach for Biomarker Discovery in Plants and Human Disease

John Ryals, PhD, CEO, Metabolon

November 15 History of a Paradigm-Busting Therapy for Breast Cancer...Herceptin

H. Michael Shepard, PhD, Chief Scientific Officer, Halozyme Therapeutics, Inc. UCD Alum

November 22 From Bench Scientist to CEO: Different Roles, Same Strategy

Julie Cherrington, PhD, President and CEO, Pathway Therapeutics

UCD Alum

Thanksgiving Holiday

November 29

December 6 Bayer Biologics: Developing Microbe Based Sustainable Solutions for Agricultural Pest Management and Crop Improvement

Damian Curtis, PhD, Senior Scientist Microbiology and Adrian Duel, PhD, Scientist II, Department of Invertebrate & Pathogen Biology - Bayer CropScience

Seminar Series is Open to the Public

MIC 292 FROM DISCOVERY TO PRODUCT - WINTER 2014

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. (<http://www.novozymes.com>) 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 (CRN #42595).

Seminars are held from 12:10-1 PM in Room 1022, Life Sciences building

Jan 6, 2014 Organizational Meeting: Course Overview and Scientific Foundations of Industrial Enzymes (Kjelstrom, Yaver)

Jan 13, 2014 Discovery of enzymes from nature and improvement of enzymes by protein engineering

Jan 20, 2014 **Holiday** No class

Jan 27, 2014 Bacillus Expression Hosts
Bill Widner, PhD, Staff Scientist

Feb 3, 2014 Fungal Expression Hosts and Yield Improvement
Speaker: TBA

Feb 10, 2014 Development of Bioprocessing Procedures
Audrey Diano, PhD, Group Leader

Feb 17, 2014 **Holiday** No class

Feb 24, 2014 Enzymology & Application Chemistry of Bioengineered Enzymes
Alex Berlin, PhD, Senior Research Manager

Mar 3, 2014 Phylogenomics and proteomics as discovery tools in bioenergy applications
Paul Harris, PhD, Staff Scientist

Mar 10, 2014 Production of chemicals by microorganisms i.e. metabolic engineering
Steve Brown, PhD, Staff Scientist

Mar 17, 2014 The Business of Enzyme Production & Future Developments
Debbie Yaver, PhD, Director



This seminar series is open to the public

MARK YOUR CALENDARS

Women in Leadership Seminar Series (See article for details):

October 9	Girl Rising, Genome Cntr Auditorium, 5-7pm RSVP Here
October 16	Half the Sky: P1, Genome Cntr Auditorium, 5-7pm RSVP Here
October 23	Half the Sky: P2, Genome Cntr Auditorium, 5-7pm RSVP Here
October 30	Makers: P1, Genome Cntr Auditorium, 5-7pm RSVP Here
November 6	Makers: P2, Genome Cntr Auditorium, 5-7pm RSVP Here
November 13	Makers: P3, Genome Cntr Auditorium, 5-7pm RSVP Here
December 2	WIL Panel Discussion, Conference Cntr Ballroom 3:30-5pm RSVP Here

March 3	Retreat Attendance Forms Due
March 7	Retreat Abstracts & Oral Presentations Due
March 22	23rd Annual Biotechnology Training Retreat in Napa
April 12	Picnic Day: Biotech Event in 148 Briggs Hall
April 23	NIH/Biotech Training Grant Fellowship Applications Due
May 23	TBC 2014 (Teen Biotech Challenge)
July 21 - 25	Flow Cytometry Intensive Course (Approx. Date)
August 4 - 8	Proteomics Course (Approx. Date)





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