



BIOTECHNOLOGY TIMES

Winter 2007

An annual newsletter from the UC Davis Biotechnology Program

Marianne Hunter, Editor

Also posted at: www.biotech.ucdavis.edu and www.deb.ucdavis.edu

A MESSAGE FROM THE DIRECTOR

Happy New Year! We have been extremely busy and productive, so 2006 was just a blur. We submitted the competitive renewal for the Training Grant in Biomolecular Technology in May, had a site visit in November and received a very positive review in late December. We are hoping that our score is good enough for continued funding. Please join us in Napa on March 31, for the Training Program Retreat so you can meet our 2006-07 Fellows.

As many of you already know, I was named as a Co-Director for the Howard Hughes Medical Institute's Integrating Basic Science into Medicine (IMBS) Training Grant (Ann Bonham, Director). We selected 8 outstanding scholars in May 2006 for the inaugural class of translational researchers. Three of our DEB students were selected and will also receive a Designated Emphasis in Translational Research. We will select our 2007-08 scholars in May.

Speaking of the Designated Emphasis in Biotechnology (DEB), we are rapidly growing! 2006 was our largest recruitment year and we now have 115 students. Many students join the DEB as soon as they come on campus. They tell me that they came to UC Davis because of this unique program. Our website is turning out to be a good recruitment tool. In addition, the Applied Science graduate program has requested affiliation. This brings our number to 24 graduate programs affiliated with the DEB. Many of our DEB students are learning more about business through the Little Bang and Big Bang as well as the Business Development certificate program. The DEB was featured at the 2006 Chancellor's Fall Conference as a successful graduate program. Prof. Abhaya Dandekar, Suzanne Barber (DEB student), Dr. Alberto Iandolo (DEB grad) and I were on the panel. Prof. Karen McDonald was the moderator. It was a very proud moment for us.

In regards to Biotechnology Program personnel, we said farewell to Assistant Director Carey Kopay in November. She was recruited to be the Executive Director of the Edward Teller Center (jointly run by LLNL and the UCD School of Education). We wish her much success in her new position.

Dr. Judy Kjelstrom, UC Davis Biotechnology Program Director



We were able to fill her position on an interim basis with Dr. Denneal Jamison-McClung. She received her PhD in Genetics with a Designated Emphasis in Biotechnology in 2003 and has been teaching as an adjunct faculty member at CSU, Sacramento and as a lecturer at UC Davis, section of Plant Biology. She is doing an outstanding job in overseeing the BioTECH SYSTEM, the Teen Biotech Challenge and the summer short course planning. The search for the permanent Associate Director will be done in the next few months.

On behalf of all of the faculty, students and staff affiliated with the Biotechnology Program, I would like to extend our heartfelt thanks to Prof. Gary Anderson (Animal Science) for his dedicated service to the Biotechnology Advisory Committee, the Biotechnology Training Grant, and the numerous other projects. Although he is retiring and moving back to his farm, he will always be with us in spirit. He is a true pioneer in the area of animal biotechnology and cloning techniques. Personally, I appreciate his dry sense of humor, humble demeanor and sense of fairness. I will miss my nordic friend very much.

Speaking of farewells, two of our long time industry partners, Scios (Fremont location) and Berlex Biosciences in Richmond were shut down in 2006. I would like to personally thank Dr. Linda Higgins, Dr. Aaron Nguyen (DEB grad) and Dr. Edwin Hagnazari (DEB grad) from Scios and Dr. Rick Harkins from Berlex for their commitment to the educational programs at UC Davis. Hopefully we can reconnect with them when they get re-settled. The Advanced Degree Program will never be the same without our outstanding Berlex students.

We welcome some new industry friends: Amyris; BioMarin Pharmaceuticals; Novartis (Vacaville site); Genomatica and others. We want to thank them for offering DEB internships and speakers for the seminar series.

Our community outreach programs continue to expand through the BioTECH SYSTEM. The Teen Biotech Challenge is one of our biggest efforts. Please consider being a volunteer or a financial sponsor. Don't forget the Biotech Exhibit on Picnic Day.

BIOTECHNOLOGY TRAINEE FELLOWSHIP RECIPIENTS FOR 2006-2007 SCHOOL YEAR

We received many outstanding applicants for the Biotechnology Trainee Fellowship awards and had a challenging time deciding on the recipients. The final recipients for the 2006-2007 school year were:

NIH Fellows:

Suzanne Balko Barber, Chemical Engineering (Tonya Kuhl; Preceptor) “Investigating the Interaction Forces between Reversibly and Covalently Complementary Functionalized Surfaces”

Allison Dickey, Chemical Engineering (Roland Faller; Preceptor) “How Small Molecules Modulate the Interactions Between the Nicotinic Acetylcholine Receptor and a Model Membrane”

Corey Dodge, Chemical Engineering (Professor Karen McDonald; Preceptor) “Metabolic Control of Recombinant Gelatin Post-Translational Modification in Rice Cell Culture”

Dominik Green, Biochemistry & Molecular Biology (R. Holland Cheng; Preceptor) “Structural Studies of the Catalytic Cycle of Heavy Riboflavin Synthase”

Jennifer Warren, Civil and Environmental Engineering (Stefan Wuertz; Preceptor) “Establishment and Maintenance of Novel Genes in Bacterial Populations by Conjugative Horizontal Gene Transfer (HGT)”



Corey Dodge, Suzanne Barber & Allison Dickey



Dominik Green & Jennifer Warren

The Biotechnology Program would like to thank Genentech, Monsanto and Scios, Inc. Each provided a \$20 - \$25K fellowship for the 2006-2007 school year in support of the Training Program.

Biotech Fellows (Funded by campus & industry):



Michael Howland, Biochemistry and Molecular Biology (Atul Parikh; Preceptor) “Engineering genetic switches based on RNA interference”



Michael Howland



Vannarith Leang

Vannarith Leang, Chemical Engineering (Robert Powell; Preceptor) “Empirically Finding the Rate of Coalescence in Various Biosystems”



Riccardo LoCascio

Riccardo LoCascio, Microbiology (David Mills; Preceptor) “Metabolism of Flavonoids by Probiotic Lactic Acid Bacteria and Bifidobacteria Strains and Their In Vivo Effects”

Vu Bao Trinh, Biochemistry & Molecular Biology (Yohei Yokobayashi; Preceptor) “RNAi-based gene switches”



Vu Bao Trinh

First Year Biotech Fellows (funded by COE and CBS):

Elianna Goldstein, Plant Biology

Ben Lindenmuth, Chemical Engineering

Sarah Statt, Biochemistry & Molecular Biology

DESIGNATED EMPHASIS IN BIOTECHNOLOGY (DEB)

The Designated Emphasis in Biotechnology (DEB) is an inter-graduate group program that allows Ph.D. students to receive and be credited for training in the area of biotechnology.

The course requirements are covered on the DEB website at: <http://www.deb.ucdavis.edu/coursereqs.cfm>

BIOTECHNOLOGY INTERNSHIPS (MCB 282)

One of the requirements to receiving a Designated Emphasis in Biotechnology is interning for at least 3 months at a cooperating biotechnology company or a cross-college site. Several DEB students have already completed their internships and some are about to start theirs.

In 2006-2007, Genentech offered three internship slots in Research and may soon offer engineering slots in their Process Development Organization (PROP), for the DEB students. In 2006, the following students completed their internships (MCB 282):

Advanced Micro Devices (AMD) - **Ying Chen**, Statistics (David Rocke)

BioMarin Pharmaceuticals - **Corey Dodge**, Chemical Engineering & Materials Science (Karen McDonald)



Corey Dodge



Juan Pedro Sanchez

Genentech - **Anh Phung**, Biochemistry & Molecular Biology (Jason Eiserich); **Li Peng**, Biochemistry & Molecular Biology (Kit Lam); **Craig Blackmore**, Comparative Pathology (Patricia Wakenell)

Monsanto, Calgene Campus - **Michael Plesha**, Chemical Engineering & Materials Science (Karen McDonald); **Brad Niles**, Nutron (Carl Keen); and **Juan Pedro-Sanchez**, Plant Biology (David Gilchrist).

Novozymes, Inc. - **Aminah Ikner**, Microbiology (Kaz Shiozaki); **Rowena Romano**, Biosystems Engineering (Rhuihong Zhang) is currently interning.

Scios - **Jessica Bohonowych**, Pharmacology & Toxicology (Michael Denison)



Aminah Ikner



Rowena Romano



Mike Plesha



Brad Niles

ENTREPRENEURSHIP

The **Big Bang Business Plan Competition**, run by the MBA students in the Graduate School of Management, as well as the **Little Bang Poster Competition**, run by UC Davis CONNECT in partnership with the Biotechnology



program and other units on campus, are additional vehicles for our students to learn about business. Zane Starkewolfe, a DEB student from Chemistry (Angie Louie's lab) was on the Mesolytics team which shared first place for the 2006 Big Bang competition and received \$10,000. Dr. Kjelstrom was on their scientific advisory board.

Mesolytics hopes to give health care professionals a portable tool to quickly diagnose medical ailments using a swab of patients' saliva or drop of blood. The platform is based on nanowire technology proven to detect a single virus with laboratory sensitivity. Disposable test cartridges will target influenza, including the H5N1 "avian flu" subtype. Future efforts will address other respiratory ailments, HIV and common sexually transmitted diseases, and biosecurity hazards such as exposure to anthrax and plaque. The team hopes to set up its manufacturing in West Sacramento.



Zane Starkewolfe (team Mesolytics) tied first place in the 2006 Big Bang Competition

In the Winter 2007 UC Davis Center For Entrepreneurship; Paving the Way from Lab to Market Publication, our very own **DEB Fellow, Riccardo LoCascio** is quoted. Riccardo is one of nine hand-picked Business Development Program Fellows. This group includes researchers specializing in fields ranging from condensed matter physics, distributed computer systems and silicon nanostructures to mosquito malaria immunity, energy efficient transportation technologies and cryo-electron microscopy of proteins related to cancer.

Riccardo LoCascio is quoted in the publication as saying, "The combination of researchers and MBA students yields an explosive mix with brainstorming sessions that spark new ideas." LoCascio's research looks at how beneficial bacteria in infants' intestines interact with complex sugar found exclusively in human breast milk. His goal is to find ways to improve infant formulas.



Riccardo LoCascio with mentor, David Mills

TRACKING DEB GRADUATES

Looking back at the 2006-2007 school year, there were a number of students who graduated with a Designated Emphasis in Biotechnology along with their PhD's. These exemplary students had taken the required DEB courses as well as satisfied the requirement of interning with a biotech company or a cross college lab for at least 3 months. We recognize all the hard work they did to achieve their goals and proudly acknowledge them below:

Susanne Berglund (Microbiology) - Postdoctoral scholar in the laboratory of Dr. Zeleanna Golberg, School of Medicine.

Jessica Bohonowych (Pharmacology & Toxicology) - Accepted a position at Med. University of South Carolina (MUSC) after completing her internship last summer at Scios. She finished her dissertation and left for MUSC to work with Dr. Jennifer Isaacs.

Aminah Ikner (Microbiology) - Completed an internship at Novozymes in the spring of 2006, then accepted a position as a Postdoctoral Scholar in Molecular Oncology at Genentech in the summer.

Anh Phung (Biochemistry & Molecular Biology) - Interned at Genentech in the summer and fall.



Aminah Ikner was a wonderful volunteer for the Biotech Program. Shown above, she is instructing on pipeting for the cheesemaking experiment

Daniel Scott (Chemistry) - Recently joined a clean energy company in Hawaii, Hawaii Natural Energy Institute (HNEI) where he is a Postdoctoral Research Fellow.

Jennifer Taylor (Comparative Pathology) - Sr. Scientist at Hygieia Biological Laboratories in Woodland, CA.

Melinda Zaragoza (Microbiology) - Post-doctoral scholar working at UC Riverside in department of botany and plant sciences.

Update on past DEB grads:

Blythe Durbin (Statistics) Recently left a Post-doctoral position at UC Berkeley School of Public Health and is now working as a Biostatistician at Genentech in South San Francisco.

Amanda Fischer (Plant Biology) Now working as a Post-doctoral Researcher at Novozymes, before that was a Research Associate II at Seminis Vegetable Seeds.

Edwin Hagnazari (Biochemistry & Molecular Biology) moved from Scios to DiscoverRx, Inc. in Fremont, CA. Ed graduated in 2004.

Fatema Aziz Legrand (Comparative Pathology) joined a new start-up company as a Research Scientist II in the Bay area called BN-Immunotherapeutics.

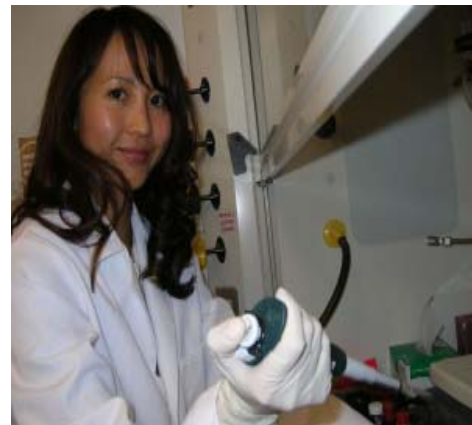
Marisa Wong-Medina (Genetics) was promoted to Research Scientist at CHORI in Oakland. She also has a new baby.

Sheetal Singh (Biochemistry & Molecular Biology) has a Post-doctoral position in Dr. Andrew Vaughan's lab (UCDMC-Radiation Oncology).

THE ADVANCED DEGREE PROGRAM (ADP)

This program is offered through the Biotechnology Program in conjunction with Graduate Studies, the College of Biological Sciences and the College of Engineering. It is designed to meet the special needs of corporate students while maintaining the campus' high standards for graduate education. Late last year, Berlex Biosciences was acquired by Bayer HealthCare and the closure was expected to result in the loss of some 300 jobs primarily in the R&D area in the Bay Area.

The Biotechnology Program is grateful for the support that Berlex has given over the years and especially their support of the Advanced Degree Program (ADP) for Corporate Employees. Our current Berlex students include: Kathy Tran, David Kiewlich, James Langstrom and Sharlene Velichko. Kathy is nearing graduation and the other two will convert over to full time graduate students.



Katherine Tran

BIOTECHNOLOGY TRAINING RETREAT

For the past 15 years, the Biotechnology Program has organized a 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 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. All first-year Biotechnology Fellows are invited to the conference. The Retreat has the reputation for outstanding interactions of both academic and industrial trainers in the many and varied disciplines of biotechnology. It also offers new perspectives on how academic research can contribute to advancing industrial biotechnology and vice versa.

Considerable time is allotted for casual interactions and discussions and at least one research project has been conceived due to such interactions.

Last year's Retreat was a huge success and we are looking forward to the 16th Biotechnology Training Retreat which takes place March 31st.



The 2005 - 2006 Fellows:

Top - Gian Oddone, Vannarith Leang, Suzanne Barber, Vu Bao Trinh

Bottom - Riccardo LoCascio, Allison Dickey, Jennifer Warren, and Corey Dodge

Not pictured: Laura Higgins

BIOTECH ON PICNIC DAY

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 exhibit allows the general public to have a hands on experience in various biotech related experiments including cheesemaking, the new developments for stonewash jeans dye, and DNA extraction. We want to thank all of our industry partners for their donations as well as the DEB students and Biotech in the Classroom for running the experiments.

Join us on April 16, 2007 in 148 Briggs Hall!



Erin Schwartz, a DEB student, teaches the cheesemaking process to eager young 'scientists'!



Laura Higgins, a 2005-06 Fellow, presenting her poster at the 2006 Biotech Retreat

HHMI -IMBS TRAINING PROGRAM

The IMBS Training Program is a Howard Hughes Medical Institute (HHMI)-sponsored initiative to provide an innovative, cost-effective, and sustainable model for training a new cadre of Ph.D. biologists and engineers who will have productive careers in clinically-relevant basic research. Please visit the website at: www.ucdmc.ucdavis.edu/imbs/

We are pleased to announce that three of our DEB students have received fellowships for the inaugural year (2006-07). They are **Astra Chang**, **Caroline Meloty-Kappella** and **Zane Starkewolfe**



Astra Chang; Molecular & Cellular Integrative Physiology



Caroline Meloty-Kappella; Cellular & Developmental Biology



Zane Starkewolfe; Chemistry

NIH and HHMI have both targeted the national need to fund research in ways that accelerate the translation of basic discoveries into novel therapies and clinical practices. The strong skill sets in team/translational science provided by IMBS training will strongly advantage its participants in preparing for successful careers in academia or industrial/pharmaceutical settings. The Biotechnology Program is very pleased to be a partner with the School of Medicine.



**Dr. Denneal Jamison-McClung
New BioTech SYSTEM Program Coordinator**

The UCD Biotechnology Program is a co-founder of the BioTech SYSTEM and serves as its administrative home. It is a new consortium for biotech education, training and mentoring for K-14 teachers and students in the Greater Sacramento Valley. It is an association formed from partnership between organizations within the Solano, Yolo and Sacramento Counties coming together to support science education and training in the greater Northern California region. **Carey Kopay** was the founding Director. She left the position in November to become the Executive director of the Edward Teller Center (ETC).

Our partners include:

High Schools: Davis; Vacaville; Marysville; Benicia; Rodriguez, Fairfield; Casa Robles, Orangevale; Del Oro, Loomis; Pioneer, Woodland; Health Professions, Sacramento; St. Hope/Sacramento ; Sheldon High School, Elk Grove; Christian Brothers, Sacramento; Loretto, Sacramento.

County Office of Education/ROP: Solano COE; Yolo COE

Community Colleges: Solano Community College; American River College; Woodland CC and North Valley & Mountain Biotechnology Center

University Partners: UC BREP; Edward Teller Education Center/Lawrence Livermore National Labs; CSU Sacramento, Natural Sciences and Mathematics
UC Davis: Biotechnology Program; College of Biological Sciences; College of Agricultural & Environmental Sciences (Barbara Soots -Biotechnology in the Classroom); Center for Biophotonics Science & Technology, Med Center; Center for Virtual Care; School of Education (Rick Pomeroy: Young Scholars Program) and Carey Kopay, etc.

Community Organizations: SACTO; SARTA

Industry Affiliates: Genentech; Monsanto/Calgene; Novozymes; BioRad and MMI Genomics, Inc.

For more information on this organization, please see the BioTech SYSTEM website at www.biotechsystem.org or contact **Denneal Jamison-McClung** at djjamison@ucdavis.edu.



2007 TEEN BIOTECH CHALLENGE

One of the main projects for the BioTech SYSTEM, will be the 2007 Teen Biotech Challenge in partnership with the UC Davis Biotech Program and the North Valley & Mountain Biotech Center at ARC. The Teen Biotech Challenge is a contest that promotes understanding of biotechnology's impact on our daily lives and rewards academic excellence in our region's teens.

Competition participants will complete a research project on a selected topic within the scope of biotechnology. Students will use this research to design a web page that illustrates and discusses major aspects of biotechnology within their chosen area of focus.

Entries will be evaluated based on quality of information and in web design, adherence to contest directions and creativity. Winners will be chosen within each topic area and awarded cash & prizes. For more information, visit the website: <http://www.teenbiotechchallenge.org>

We are looking for additional sponsors from campus units, industry, etc. and hope to get our DEB faculty and students involved in this outreach effort!



2006 Teen Biotech Challenge winners displaying their biotech web-sites

BROWSING GENES AND GENOMES WITH ENSEMBL WORKSHOP

The Biotechnology Program along with the Genome Center's Bioinformatics Core ran an ENSEMBL workshop on January 23rd that was a 4 hour intensive class taking place in one of the Sciences Lab Building's computer labs. This was a free course that provided a comprehensive and integrated source of annotation of, mainly vertebrate, genome sequences and was primarily targeted at wetlab researchers.



Dawei Lin (Bioinformatics Core), Bert Overduin (EBI) & Judy Kjelstrom (Biotech Program)

The instructor, Dr. Bert Overduin from the European Bioinformatics Institute, had worked for 4 years as a Post-doctoral scholar with Prof. David Gilchrist at the Center for Engineering Plants for Resistance Against Pathogens at UC Davis, where he studied disease-associated programmed cell death (apoptosis) in tomatoes. This workshop turned out to be a huge success, receiving excellent comments from the course evaluation questionnaires.



Bert Overduin instruction a full ENSEMBL workshop in SLB computer lab

2007 SUMMER SHORT COURSES:



Flow Cytometry (mid July)

Lead Instructors - Dr. Barbara Shacklett & Carol Oxford, School of Medicine (partner with FloCyte)

Facility - Tupper Hall



Proteomics Course (late August)

Lead Instructor - Dr. Brett Phinney

Facility - Proteomic Core Facility



DNA Microarrays Course (mid September)

Lead Instructor - Dr. Satya Dandekar, Co-Sponsored by DNA Microarray Core Facility and Dr. Katrin Stapleton, Affymetrix, Inc.

Facility - DNA Microarray Core Facility



Full information will be provided on our website: <http://www.biotech.ucdavis.edu/SummerCourses/courses.cfm> when dates are finalized.



**2006 Proteomics Summer Short Course
(one of the lab portions)**

FUTURE EVENTS

March 31, 2007 - 16th Annual Biotechnology Training Retreat in Napa

April 14, 2007 - Picnic Day, Biotech Event in 148 Briggs Hall
Student volunteers needed!

April 23, 2007 (tent.) - 2007-08 Biotech Fellowship Applications
Due (pending renewed funding)

May 1, 2007 (tent.) - HHMI-IMBS Training Grant Fellowship
Applications Due

May 29, 2007 - Annual Teen Biotech Challenge awards
ceremony

DEB alumni, please send us your personal updates for the newsletter! Feel free to include honors or positions that you may have received, as well as any special events (new baby, new job, etc.). Please contact the Biotechnology Program at biotechnprogram@ucdavis.edu and we will be happy to include it in the next newsletter!

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