



2nd Annual GREAT* Training Retreat



**Laguna Beach, California
October 23 & 24, 2005**

**UC Systemwide Biotechnology
Research and Education Program**

***Graduate Research and Education in Adaptive bio-Technology Training Program**



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Aliso Creek Inn
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**UC Systemwide Biotechnology Research
and Education Program**

Director

Martina Newell-McGloughlin

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**Graduate Research and Education in Adaptive bio-Technology Training
Program**

The University of California Biotechnology Research and Education Program, Graduate Research in Adaptive bio-Technology Training (GREAT) Program

Our Program supports the training of the brightest young graduate students within the University of California system for research at the interface between the life sciences and any of the disciplines within the physical, chemical, material, engineering, mathematical and computational sciences. The result—the Graduate Research and Education in Adaptive bio-Technology (GREAT) Training Program awards individual fellowships up to \$50,000 each per year.

By providing funding directly at the trainee level, our Program has more direct control of where the funds are allocated, has the potential to greatly increase distribution across campuses, has a greater impact in evolving cutting edge cross-disciplinary fields, and provides a means of tracking results.

The response to our first two calls for GREAT pre-proposals was overwhelming! We received 109 pre-proposals in 2003 (and over 140 in 2004) of outstanding quality and tremendous diversity. From these, we selected 34 (38 in 2004) applicants to go forward with full proposal submission. The final proposals were all of exceptional quality and the competition was extraordinarily rigorous since the excellence of the proposals and the caliber of students were uniformly outstanding. From the finalists of each year, eleven proposals that best reflected the mission of the UC Biotechnology Research and Education Program and the GREAT Program were selected.

All projects provided an environment for non-traditional cutting-edge cross-disciplinary training from investigators who displayed the greatest expertise and creativity working at the interface of complementary disciplines in:

- **nanotechnology as it applies to the life sciences**
- **novel biosensors**
- **medical microdevices/delivery systems, bio-materials**
- **bio-devices/instrumentation/bio-MEMS**
- **microarrays**
- **bioinformatics and molecular modeling**
- **chemical proteomics,**
- **genomics**
- **bio-imaging**
- **computation in the cognitive sciences**

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PROGRAM OVERVIEW

Sunday, Oct. 23, 2005

- 11:30 – 12:00 PM Registration and check-in
Green and Terrace Room Foyer
- 12:00 – 1:00 PM Lunch
- Welcome by **Fred Fox, Chair**
 - Overview of program **Martina Newell-McGloughlin** Director,
UC Biotechnology Research & Education Program
- Terrace Room Patio** (weather permitting)
- 1:00 – 1:30 PM Poster set up and presentation preparations
Terrace Room
- 1:30 – 4:45 PM **Presentations by the 2004 and 2005 GREAT trainees**

GREAT trainees will make presentations of their research and cross-disciplinary training environment according to topic area. Trainees will have 15 minutes if first year GREAT trainee or 20 minutes if second year GREAT trainee for his/her presentation. There will be five minutes Q&A after each presentation.

Theme: Regulation/Proteomics

- 1:30 **Genome-wide Identification of Human Branch Point Sequences
Using an SF1 Affinity Model**
Alex Pastuszak, UCSF
- 2:00 **Rapid Parallel Discovery of Protein Kinase Signaling Pathways**
Justin Blethrow, UCSF
- 2:30 **Engineering Cellular Signal Processing: Introducing Synthetic
Feedback Loops into a MAP Kinase Pathway**
Caleb Bashor, UCSF; introduced by Professor Wendell Lim

3:00 **A Novel Pool-Deconvolute Strategy For Protein Interaction Mapping**
Fulai Jen, UCLA; introduced by Professor Jing Huang

3:30 Break

Theme: Regulation/Modeling

3:45 **Asparagine as A Substitute for Glutamine in Cell Culture: A Comparative Analysis of Isotopomer Data by Pathway and Network-Based Methods**
Thuy Vo, UCSD; introduced by Markus Herrgard

4:15 **Mechanical Unfolding of Single RNA Molecules**
Jeffrey Vieregg, UCB; introduced by Professor Ignacio Tinoco

4:45 Break for Poster session/networking/room check-in

6:00 – 7:00 PM Dinner in Aliso Creek Inn Restaurant

7:00 Industry Presentations

Berlex A specialty pharmaceutical company whose history reaches back more than 130 years. Berlex's singular approach to developing and making specialized medicines already has yielded innovations in treating multiple sclerosis, female health concerns, cancer and in the creation of new diagnostic imaging techniques. Berlex's research mission is to be a world leader in innovative drug discovery and development with centers of excellence in cardiovascular, cancer and immuno-based diseases by combining the best of biotechnology and pharmaceutical technologies.

David Light of Berlex - Presentation Topic: *Examples of recent antibody discovery projects including a targeted antibody fusion protein potential drug candidate.*

Intelligent Optical Systems, Inc. (IOS) An R&D company developing cutting-edge technologies in optical sensing and instrumentation. IOS drives innovative technologies through the development cycle all the way to fully-functioning, independent spin-off companies that focus on physical, chemical, remote sensing, and biological sensing instrumentation, in key markets segments such as homeland security, biotechnology, medical, aerospace, environmental, and industrial control.

Glenn Bastiaans of Intelligent Optical Systems, Inc
Presentation Topic: Chemical and Biological Sensor Design

Invitrogen A key partner in the global life science community, Invitrogen provides products and services that support academic and government research institutions as well as pharmaceutical and biotechnology companies. Their research and development efforts are focused on breakthrough innovations in all major areas of biological discovery, including functional genomics, proteomics, bioinformatics, and cell biology.

Paul Predki of Invitrogen – Presentation Topic:

MediaCybernetics. Media Cybernetics helps individuals and organizations extract and mine knowledge from images through world-renowned software for image capture, processing, analysis, display, and management. Their products simplify and enhance image-based data collection and analysis for those who wish to increase accuracy and automate research, development, and quality processes.

Will Casavan of MediaCybernetics

Presentation Topic: Media Cybernetics- Image Analysis Software for the Life Sciences: “Imaging Software for Life Science Solutions”

Olympus America, Inc. A global corporation with extensive R&D resources, a vast product offering and facilities around the world, Olympus began in with one goal: to become a leader and innovator in the mass production of microscopes. As a testament to the blending of innovative ideas, advanced technology, and manufacturing know-how, the company did, indeed, make a strong entry into the market with its first microscope, the Asahi, just one year after its origination.

Edward Lachica of Olympus America, Inc. – Presentation Topic:

Science Applications International Corporation (SAIC) SAIC engineers and scientists solve complex technical problems in national security, homeland security, energy, the environment, space, telecommunications, health care, and logistics. A Fortune 500® Company, it now ranks as the largest employee-owned research and engineering firm in the United States. SAIC and its subsidiaries have more than 43,000 employees with offices in over 150 cities worldwide.

Jake Lefman of SAIC – Presentation Topic:

Vitasoft Their mission is to provide scientists with new tools to analyze and manipulate DNA and protein sequence information. Their focus is to concentrate on software niches not already filled by others with the hope that they can complement rather than provide "me too" software products. *DNAScriptor* is their first product. The program has most of the features found in modern sequence analysis software, but its major contribution is that it provides a simple script drive language called *DNAScript* that a allows the user to explore sequence analysis concepts in a generalized program mode.

John Monahan of Vitasoft – Presentation Topic:

9:00

Adjourn

Monday, October 24, 2005

7:30 – 8:00 AM Hosted Continental Breakfast in the **Terrace Room**

8:00 – 12 noon **Presentations by the 2004 and 2005 GREAT trainees**

Theme: Regulation/Modeling, revisited

8:00AM **A Novel System to Quantitatively Analyze Cause-Effect Relationships in Cellular Pathogenesis**
Siddartha Mitra, UCSF; introduced by Professor Steven Finkbeiner

Theme: Tools

8:30 **Dielectrophoresis Activated Cell Sorter**
Jiangrong Karen Qian, UCSB; introduced by Professor Tom Soh

Theme: Nanotech

9:00 **Towards Multifunctional Nanoparticle-based Therapeutics**
Austin Derfus, UCSD; introduced by Professor Sangeeta Bhatia

9:30 **Trehalose Preservation Of Model Cell Membranes Investigated At the Nanometer Scale**
Sandra Bennun, UCD; introduced by Professor Roland Faller

10:00 BREAK/Poster viewing

10:30 **Biomolecular Routes To Nanoelectronics**
Overview of August Estabrook's work by Professor Norbert Reich, UCSB

11:00 **Fabrication Of One-Dimensional Nano-Biosensor**
Mangesh Bangar, UCR; introduced by Professor Nosang Myung

11:30 **Molecular Imaging and Biosensing with Functionalized Xenon**
Tom Lowery, UCB; introduced by Professors David Wemmer and Frank Chen

12 noon Lunch – Aliso Creek Inn Restaurant or Deck

1:00 - 5:00 PM **Presentations by the 2004 and 2005 GREAT trainees**

Theme: Tools, revisited

1:00 PM **Image Feedback Controlled Optoelectronic Tweezers for Parallel Cell Manipulation**
Eric Chiou, UCB

Theme: Nanotechnology

1:30 **Functional Modulation Of Dendritic Cells With Antigen-Conjugated Quantum Dots**
Debashish Sen, UCI; introduced by Professor Michael Cahalan

2:00 **Advancing Forensic Human Identification Through Microfabrication Technology**
Stephanie Yeung, UCB; introduced by Professor George Sensabaugh

2:30 **Label-Free, High Throughput Optical Detection Of Biochemical Reactions In Microarray Format**
James Landry, UCD; introduced by Professor Ziangdon Zhu

3:00 BREAK/Poster viewing

3:30 **Integrated Bio-Photonic Waveguide Devices For Optical Studies Of Single Biomolecules**
Dongliang Yin, UCSC; introduced by Professor Holger Schmidt

Theme: Biomaterials

4:00 **Controlling Neural Stem Cell Behavior With Synthetic Hydrogels**
Krishanu Saha, UC Berkeley; introduced by Professor Kevin Healy

4:30 **Improving Oral Drug Delivery Through The Identification Of Safe And Effective Permeation Enhancers**
Katie Whitehead, UCSB

5:00 Summary, conclusion and adjourn