



This Fall the Department of Biomedical Engineering will be initiating a new series of events aimed at increasing our already active collaboration with the biomedical device industry in Orange County, Calif. We are planning an event each quarter in which faculty and individuals from the private community can come together to share common interests related to the development of new biomedical engineering technology.

The first event provides a forum to explore the latest intellectual property from the faculty that has a high potential for commercialization to the private sector. The events planned for the Winter and Spring quarters will focus on a particular clinical area and be sponsored by a local company. Please mark your calendars for the following events:

**Tuesday, November 9, 2004** at 11:00 am - 3:30 p.m. at the Beckman Center

- "UCI Biomedical Engineering Technology: Ready for Commercialization"
- Speakers include: Fan-Gan Zheng, Ph.D, Mark Bachman, Ph.D, James Earthman, Ph.D, Ghassam Kassab, Ph.D, Abraham Lee, Ph.D, and Dr. Gregory Evans, UC Irvine

**Tuesday, February 1, 2005** at 6:00-8:30 p.m. at the University Club

- "Faculty-Industry Technology Forum: Cardiovascular Disease"
- Speaker: Ghassan Kassab, Ph.D, UC Irvine
- Hosted by Edwards Lifesciences

**Thursday, May 12, 2005** at 7:30-9:30 a.m. at the University Club

- "Faculty-Industry Technology Forum: Ophthalmology"
- Speaker: Tibor Juhasz, Ph.D, UC Irvine
- Hosted by Advanced Medical Optics

To attend one of these events, please register at [www.octane.uci.edu](http://www.octane.uci.edu) or contact Deborah Nielsen at [dfnielse@uci.edu](mailto:dfnielse@uci.edu) or (949) 824-3245 for more information.

I would also like to welcome our newest faculty member – Dr. Tibor Juhasz. Dr. Juhasz joined our faculty on October 1st from the Department of Biomedical Engineering at the University of Michigan. While there, he developed a highly successful research program centered on femtosecond laser applications for Ophthalmological problems. His discoveries led to the formation of Irvine-based IntraLase – a company whose laser technique is the base technology used to create the corneal flap in the LASIK procedure.

Additional news on our undergraduate and graduate programs, and faculty are presented in the following pages. More information regarding upcoming events and new faculty members is available on our Web site [www.bme.uci.edu](http://www.bme.uci.edu).

Cordially,

**Steven C. George**

William J. Link Professor and Chair

## FACULTY PROFILE: BRUCE TROMBERG



Professor Bruce J. Tromberg, Ph.D., is the Director of the Beckman Laser Institute (BLI) at UC Irvine, a multi-disciplinary research, teaching, and clinical facility dedicated to advancing optics and photonic technologies in medicine and biology. Dr. Tromberg is also the Director/Principal Investigator of the Laser Microbeam and Medical Program (LAMMP), a National Institutes of Health Biomedical Technology Center, at the BLI (<http://www.bli.uci.edu>).

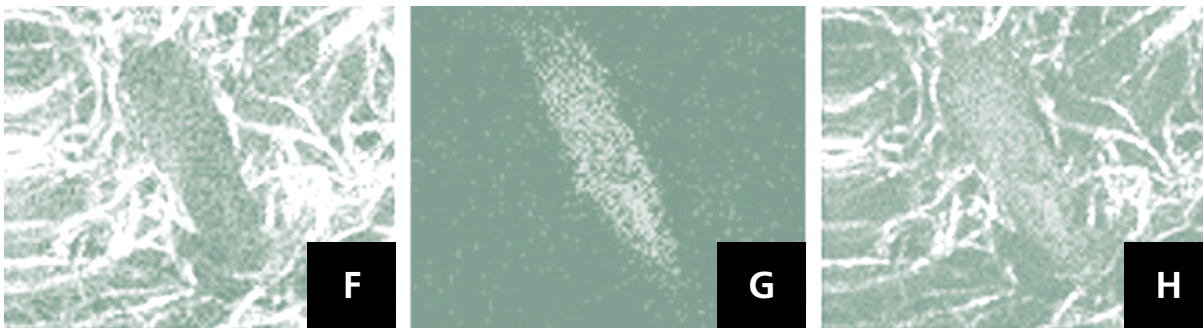
Dr. Tromberg received his B.A. in Chemistry from Vanderbilt University and M.S. and Ph.D. degrees in Chemistry from

the University of Tennessee, where he was a Department of Energy/Oak Ridge Associated Universities Fellow in the Oak Ridge National Laboratory. He was a Hewitt Foundation Fellow at the Beckman Laser Institute and joined the BLI faculty in January 1990. Dr. Tromberg is also a professor of Biomedical Engineering and Surgery at UCI and Vice Chair of the Department of Biomedical Engineering.

As a member of the UCI faculty, Dr. Tromberg pioneered the development and application of several new photonic technologies in the areas of diffuse optical imaging, photodynamic therapy, and multiphoton microscopy. He has published more than 190 scientific papers, holds 8 patents in the field of Biomedical Optics, and has led the integration of optics into clinical studies of breast and gynecologic cancer in UC Irvine's Chao Family Comprehensive Cancer.

In October 2003 Dr. Tromberg received a five-year, \$7 million award from the National Cancer Institute to form a national "Network for Translational Research in Optical Imaging (NTRIOI)". The goal of this special research program is to advance alternative methods for breast cancer detection using optical imaging technologies that he and colleagues at the Beckman Institute pioneered in the early 1990s. Major institutions participating in the project include UC Irvine, UC San Francisco, the University of Pennsylvania, Harvard/Massachusetts General Hospital, Dartmouth University, the University of Illinois at Urbana-Champaign, Siemens Corporate Research Inc., and the National Institutes of Health. NTRIOI research focuses on creating new instruments specifically designed for detecting breast cancer and monitoring breast cancer therapies, particularly in women with high mammographic density. (<http://www.bli.uci.edu/ntroi/index.html>).

Dr. Tromberg is the editor-in-chief of "The Journal of Biomedical Optics" the only peer-reviewed journal of optics in Biology and Medicine, and the past chair of the Optics in Biology and Medicine working group of the Optical Society of America. He has received several awards, including the Coherent Biophotonics Young Investigator Award, OE magazine's Technology Innovator award, the R & D 100 award, and was recently elected to the board of the International Society of Optical Engineering (SPIE).



*Tissue imaging using intrinsic signals from the Tromberg lab: Multiphoton microscopy images of a single fibroblast cell interacting with extracellular matrix in an engineered skin model. (f) shows only collagen fibrils using second harmonic generation tomography. (g) shows flavoprotein fluorescence from two-photon excitation in the fibroblast cell. (h) shows the merged cell-matrix image. Each panel is  $35\ \mu\text{m} \times 35\ \mu\text{m}$ . From Zoumi et al, PNAS, 99 (17), 11014-11019, (2002)*

## BME Undergraduate Enrollment

The BME undergraduate program is growing at a rapid pace. The incoming Fall 2004 class will be the second admitted class for the two majors in the program: Biomedical Engineering and Biomedical Engineering: Premedical. As of May 31, 2004, 139 students accepted admission to these programs, of which 47 declared Biomedical Engineering major and 92 Biomedical Engineering: Premedical. These figures are expected to increase by the start of the Fall quarter of 2004. At that time, the program will have more than 400 undergraduate students, of which 41% enlist in the Biomedical Engineering major and 59% in the Biomedical Engineering: Premedical major. Tables 1a and 1b detail the enrollment statistics in the two majors. Table 2 shows the profile of the 2004-2005 undergraduate students for both programs. Of particular interest is the significantly higher GPA of incoming BME students compared to the average of those admitted to The Henry Samueli School of Engineering.

Another significant update is that, with the support of the Whitaker Foundation Grant, we have successfully implemented the first of three specializations in the undergraduate program – biophotonics. Students opting for this specialization in their undergraduate program will be educated in the development and use of optical technologies to examine and manipulate biological systems on the sub-cellular, cellular, tissue, and organ levels. This specialization includes the completion of 12 units in the following coursework: BME 135 (Photomedicine) or CBEMS 126 (Biomedical Photonics), and two of the following: BME 136/136L (Engineering Optics for Medical Applications), BME 137 (Introduction to Biomedical Imaging), and EECS 180 (Engineering Electromagnetics).

**Table 1A. Enrollment Statistics – Biomedical Engineering (ABET)\***

Academic Year	Freshman	Sophomores	Juniors	Seniors
2002-03	32	23	–	–
2003-04	45	36	17	–
2004-05	47	44	34	32

\*expected accreditation 2007

**Table 1B. Enrollment Statistics – Biomedical Engineering Premedical**

Academic Year	Freshman	Sophomores	Juniors	Seniors
2002-03	26	18	–	–
2003-04	94	27	13	–
2004-05	92	80	35	22

## GRADUATE PROGRAM ATTRACTS TOP TALENT

During the past year, the graduate program has experienced tremendous growth as it strives to be one of the leading programs in the nation training 21st century researchers in biomedical engineering. Five new graduate courses have been introduced into the curriculum over the last year:

BME263 – Microsystems for Biomolecular Assays – Lee

BME295 – Introduction to Biomedical Imaging – Chen

BME295 – Rendering Techniques for Biomedical Imaging – Meyer

BME295 – Biomedical Microimplants – Tang

BME230B – Advanced Engineering Mathematics – Cristini

With the increase of faculty members the list of course offerings will grow to reflect the breadth of the research activities.

We are pleased to welcome the class of 2004-05 this fall quarter! The acceptance rate has been lowered to a very competitive 12%. The new class includes 17 M.S. / Ph.D. students and 16 M.S. students who were selected from among 278 applicants – nearly twice the number of applicants from last year. The average GPA for incoming graduate students is a record 3.5, and the GRE quantitative score is an impressive 750. Needless to say, the ability to attract high quality students while experiencing rapid growth in numbers is the sign of a strong program.

As a testament to the quality of students already in our program, several graduate students have received prestigious external scholarships / fellowships. Joel Martinez received the Ford Foundation Predoctoral Fellowship. Anne Taylor received the National Research Service Award (NRSA) Fellowship from National Institutes of Health (NIH), Wajee Saadi received the DOD Breast Cancer Research Program Fellowship, David Cuccia received the National Science Foundation (NSF) Graduate Student Fellowship, and Tia Smith and Craig Griffith both received the NIH Minority Student Fellowship.

**Table 2. Fall 2004 Incoming Freshman Student Profile Average**

Degree Program	Math SAT Scores	Verbal SAT Scores	Self-Reported GPA	Transfers Self-Reported GPA
School of Engineering	663	595	3.69	3.39
Biomedical Eng (ABET)	660	600	3.78	3.59
Biomedical Eng: Premed	640	580	3.80	3.79



# BME Discovery

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