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SUMMER 2012

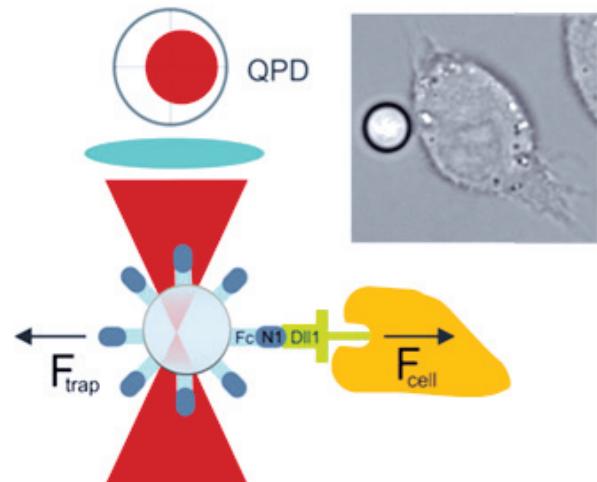
CAN WE TALK? CELL TO CELL COMMUNICATION

In collaboration, Elliot Botvinick, Ph.D., of UC Irvine and Gerry Weinmaster, Ph.D., of UCLA published complementary studies in the journal *Developmental Cell* in which they used optical tweezers to detect and measure the mechanical force produced by cells when bound to Notch, a cellular pathway that serves as a communications network to ensure that the correct cell types form at a precise time and location in the body.

During formation of multicellular organisms, cells need to talk to one another in order to make critical decisions as to what kind of cell to become as well as when and where to become that cell type. The Notch signaling system allows cells to directly talk to each other in order to pattern many vital cell types in the body. Together, the researchers at the BLI and UCLA's Jonsson Comprehensive Cancer Center have

shown for the first time that endocytic forces produced by the signal-sending cell are critical for inducing Notch signaling within the signal-receiving cell. Prior to these findings, Dr. Weinmaster had hypothesized that Notch-ligand expressing cells pull, via endocytic forces, on Notch proteins expressed by neighboring cells to unlock and activate Notch. "Our findings used optical tweezers as a novel tool to detect and measure mechanical force produced by cells when bound to Notch," said Dr. Weinmaster, Professor of Biological Chemistry. "Together with biochemical and cell biological analyses,

(Notch continued on p. 6)



Optical Tweezers act as a three-dimensional spring pulling the bead (gray circle) into the laser focus (red hour glass). The bead is decorated with the Notch (N1) receptor. Cells (yellow) expressing the receptor ligand (Dll1) bind Notch and pull the bead out of the center of the trap as optical forces act to pull the bead back in. The transparent bead also steers the laser which is refocused onto a quadrant photodiode (QPD). The QPD reports the position of the bead and thus the force can be calculated.

Newsbriefs

New MSO

Jan Fisher has been appointed the new Management Services Officer (MSO) for the Beckman Laser Institute (BLI) effective July 1, 2012. She is responsible for assisting faculty and staff in the daily affairs of University/BLI Operations. Jan originally joined BLI as the Payroll/Personnel Analyst last year.



Jan Fisher

(Newsbriefs continued on p. 2)

SAVE THE DATE

The G. Patricia and Arnold O. Beckman Annual Science Lecture will be held on Monday, November 26, 2012, at The Arnold and Mabel Beckman Center of the National Academies of Sciences and Engineering located at 100 Academy Way, Irvine, CA. The lecture, "Science and the World's Future," will be given by Dr. Bruce Alberts, Professor Emeritus, Biochemistry and Biophysics at the University of California, San Francisco; Editor of the journal, *Science*; and past-president of the National Academy of Sciences (1993-2005). A reception will

begin at 5:00 p.m., followed by the program in the Auditorium at 6:00 p.m., and a dinner at 7:15 p.m. Proceeds from this event benefit the Orange County chapter of the ARCS (Achievement Rewards for College Scientists) Foundation Scholarship Fund. ARCS Foundation advances science and technology in the United States by providing financial awards to academically outstanding United States citizens studying to complete degrees in science, engineering and medical research. For sponsorship information or reservations, contact Ellen M. Lewis at elewis@uci.edu.

Does Age Matter?

by Michael W. Berns, Ph.D.

Arnold and Mabel Beckman Professor
Co-Founder, Beckman Laser Institute

An amusing, or maybe not so amusing, thing happened to me a few months ago. My students and I were sitting around a table at our weekly lab meeting and someone asked me if I was going to the SPIE meetings (Society of Photo-Instrumentation Engineers). I said I was probably going to skip it this year, and my student said, "Well, you have to go."

"Why do I have to go?" I replied.

"Because they're doing a session to honor you because you're turning 70," he retorted.

Now that's something I didn't need: being reminded I was turning 70. True, I'm pleased to receive honors--but for turning 70? People generally don't like

to be reminded how old they are, especially the older they get. The only time I think of my age is when I have to give my birth date when I pick up prescriptions, both of which I find rather challenging to cope with as I get older. But really, does your age define you? I've known 90 year-olds like Arnold Beckman who mentally processed like 40 year-olds, and 40-50 year-olds (I won't name names) who still acted like ten year-olds. The really great thing about this job is that whether you're 30, 40, 50, or 70, you always will interact with students who are a lot younger than you and, in some cases, like mine, less than half my age. Now that's really cool because the more we "older" folks interact with younger ones, the younger we feel. True, we may have wisdom to impart (which may be ignored), but in return, we get challenged intellectually

and that keeps our minds sharp--something that gets more difficult with age (at least for me). I was once told by one of my professors (I think—it was so long ago!) that your graduate students should become more expert in what they are doing their research on than you, the professor. I find that to be very true, and as a result, each day is a learning experience for me. I have young "windows" into research areas and knowledge that I would not normally realize, especially since I can only stare at a computer screen for about an hour before it all goes blurry.

So age is really just relative. I didn't like being reminded that I am going to be 70 because I had never really thought about it. But now that I have been reminded of it, I think it's not so bad as long as I am surrounded by challenging students who make me think. ■

Newsbriefs (cont'd from p. 1)

Fourth Annual Allan R. Oseroff Photomedicine Lecture



The fourth annual Allan R. Oseroff Photomedicine Lecture held at the Beckman Laser Institute Library was given by Tayyaba Hasan, Ph.D., on April 24, 2012. Professor of Dermatology, Wellman Center for Photomedicine, Massachusetts General Hospital, Dr. Hasan spoke on "Getting the best of photodynamic therapy: are molecular targets the way to go?"

Medical Director Visits Russia

BLI Medical Director Dr. J. Stuart Nelson went to Moscow, Russia, on June 3-10, 2012. Under the auspices of the Vascular Birthmarks Foundation and the

Pediatric Oncology and Haematology Research Institute, N. N. Blokhin Russian Cancer Research Center, Dr. Nelson presented a lecture, "An overview of laser therapy for treating vascular lesions and non-vascular lesions," at the hospital's annual conference and spent 3 days performing free laser treatments on patients with vascular lesions such as port wine stain and hemangiomas.

Skin DOT

The Chao Family Comprehensive Cancer Center has announced the activation of the third disease oriented team (DOT), the Skin DOT. DOTs set out to bring together the collective expertise of basic, translational and clinical researchers for the prevention and treatment of cancer. They are multidisciplinary teams that focus on addressing the wide spectrum of activities that involve patients with a particular type of cancer. Their work extends from fundamental research to risk identification, clinical research and

clinical trials available to the community. DOTs also focus on outreach programs that promote prevention and early detection interventions. Members of the Skin DOT include physicians and scientists from UC Irvine School of Medicine, Physical Sciences, Engineering, Beckman Laser Institute and Medical Clinic, and Department of Pharmaceutical Sciences. The team leaders are Anthony Durkin, Ph.D., Associate Professor, Department of Surgery, Beckman Laser Institute (adurkin@uci.edu) and Kristen Kelly, M.D., Associate Professor and Clinical Vice Chief, Department of Dermatology, School of Medicine (kmkelly@uci.edu).

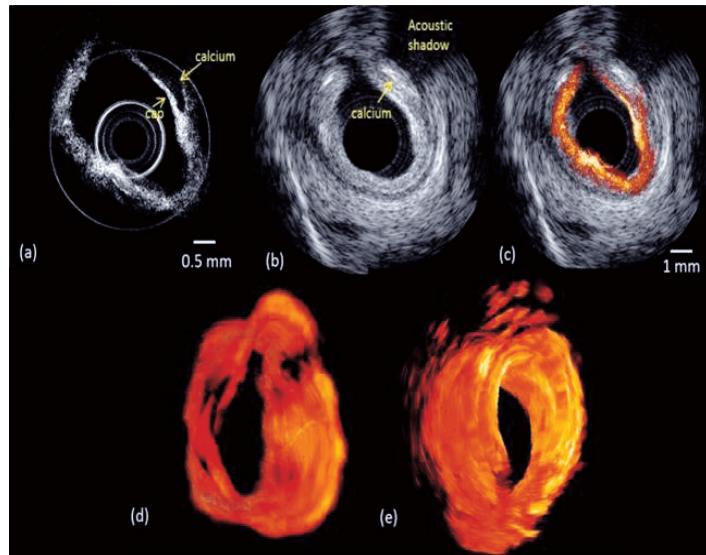
Visit from P&P Optica

P&P Optica, a technology company located in Waterloo, Ontario, Canada, visited the Beckman Laser Institute on June 14, 2012, to give a noon-time presentation on the advancement and directions of future development for their

(Newsbriefs continued on p. 4)

Identifying Vulnerable Plaque

A miniature integrated intravascular optical coherence tomography (OCT)-ultrasound (US) catheter for real-time imaging of atherosclerotic plaques has been developed by BLI Professor Zhongping Chen, Ph.D. (Department of Biomedical Engineering, University of California, Irvine), in collaboration with Pranav Patel, M.D. (Division of Cardiology, University of California, Irvine Medical Center), and Qifa Zhou, Ph.D. (NIH Ultrasonic Transducer Resource Center and Department of Biomedical Engineering, University of



Dual-modality OCT (a), IVUS (b), and combined OCT-IVUS (c) images of a human coronary artery specimen. 3D reconstruction of 1000 slices of (d) OCT and (e) IVUS images from human coronary artery.

Southern California). This catheter provides high-resolution images from OCT and deep tissue penetration from US at the same time. With an outer diameter of 1.18 mm, it is suitable for imaging in human coronary arteries. The probe was developed as part of the Microendoscopic Tomography core that Dr. Chen leads in BLI's NIH National Biomedical Technology Center, the Laser Microbeam and Medical Program (LAMMP, <http://lammp.bli.uci.edu/>).

Atherosclerosis is a major public health problem associat-
(OCT-US continued on p. 6)

Congratulations to SURP Recipients

The Summer Undergraduate Research Program (SURP)/Undergraduate Research Opportunities Program (UROP) Faculty Advisory Board has named the following BLI student researchers as SURP or E-SURP (Edwards Lifesciences Center for Advanced Cardiovascular Technology) Fellows at UCI for Summer 2012. The fellowships were awarded in the amount of \$2,000/per student.

Mentor: Dr. Henry Hirschberg
Genesis Zamora, "Photochemical internalization (PCI) enhanced nonviral transfection of pro-drug activating genes: a potential treatment modality for brain tumors."

Mentor: Dr. Bernard Choi
Christian Crouzet, "In vivo determination burn depth with laser speckle imaging."

Patrick Lo (E-SURP), "High resolution, depth-resolved imaging of mouse heart microvasculature using optical histology."

Chelsea Pittman (E-SURP), "In vivo quantitative optical analysis of implanted prevascularized engineered tissues composed of fibrin and collagen of variable concentration."

Matthew Wiersma, "High resolution imaging conveying depth information of mouse brain microvasculature using optical histology."

Mentor: Dr. Wangcun Jia

Vikram Babu, "Determining the safety and efficacy for combined pulsed laser and topical delivery of Honokiol and Rapamycin to inhibit the regeneration of coagulated blood vessels."

Mentor: Dr. Anthony Durkin

Nika Nikbakht, "Using multiphoton microscopy to characterize sun-exposed and non sun-exposed skin."

June Tong, "Modulated imaging: a wide-field optical imaging platform for clinical research."

Mentor: Dr. Albert Cerussi

Truman Nguyen, "Construction and

testing of tissue-simulating phantoms to model intrinsic optical scattering contrast between healthy and diseased breast tissue to improve breast cancer diagnosis and detection."

Mentor: Dr. Petra Wilder-Smith

Alden Calantog, "Development and validation of an optical coherence tomography based diagnostic algorithm for identifying optical characteristic changes in tooth enamel during demineralization and decay."

Mohammad Dadkhah, "The antibacterial effect of natural products on dental decay."

Amin Sarraf, "Prevention of root caries using natural products."

Mentor: Dr. Bruce Tromberg

Elliott Kwan, "Exploring laser speckle contrast imaging on skin."

Alex Matlock, "Fabrication of a fast, scalable prototype for diffuse optical spectroscopic imaging (DOSI)."

Ph.D. Candidates Walk through Graduation



Left: Dr. Bruce Tromberg with Anais Leproux in Amsterdam, Netherlands. Center: Dr. Enrico Gratton with Ylenia Santoro. Right: Dr. Elliot Botvinick with Bhupinder Shergill.

Ph.D. candidates Anais Leproux, Ylenia Santoro and Bhupinder Shergill walked through June graduation ceremonies in acknowledgment of receiving their Ph.D. degrees.

Anais Leproux defended her thesis, "Breast lesion detection using diffuse optical imaging," on April 4, 2012. While working on her Ph.D. from the University of Amsterdam under the guidance of Professor Ton Van Leeuwen, she was also working at the Beckman Laser Institute (BLI) on optical mammography for the last two years. Originally from Paris, France, Anais had a fellowship in a breast cancer program from Philips Research in Eindhoven, The Netherlands. When the program

ended, she met BLI Director Bruce Tromberg in Sweden where he was giving a lecture, and he invited her to be a part of the BLI breast cancer program. She did the research for her Ph.D. at Philips and BLI. Anais continues to work on breast imaging as an Assistant Specialist at BLI under the direction of Dr. Tromberg.

Ylenia Santoro defended her thesis, "Breast cancer spatial heterogeneity in near-infrared spectra and the prediction of neoadjuvant chemotherapy response," on May 31, 2012. Double congratulations to Ylenia: she was 8 months pregnant at the time of her thesis defense and her son, Alessandro, was born on July 30. Dr. Santoro is continuing her graduate

work as postdoctoral fellow in the Laboratory for Fluorescence Dynamics (LFD), under the supervision of her Ph.D. mentor, BME and BLI Professor Enrico Gratton.

Bhupinder Shergill, who worked in Dr. Elliot Botvinick's lab, defended his thesis, "Investigating the physical requirement of ligand endocytosis in the Notch pathway using optical tweezers," on April 13, 2012. He was the co-senior author on a publication in *Developmental Cell* (see Cover story on page 1). Dr. Shergill will continue to work in Dr. Botvinick's lab as an Assistant Specialist and will be studying encapsulation of islet tissue. ■

Newsbriefs (cont'd from p. 2)

spectrometer platforms. The company has developed a transmission-based, high performance spectroscopy platform technology which is able to quickly and accurately measure very small chemical concentrations and sells this platform technology in limited quantities to academic institutions.

Award Highlighted

The Congressionally Directed Medical Research Programs (CDMRP) has highlighted Dr. Brian Wong's Advanced Technology/Therapeutic Development

Award entitled "Reconstruction of facial cartilage frameworks using electromechanical reshaping" in its FY12 Program Book. Electromechanical reshaping (EMR) is a novel technology that allows surgeons to bend cartilage into the shape they desire by simply inserting platinum plated needles and then applying electrical current. To provide the necessary information to bring EMR into surgical practice, Dr. Wong received funding from the Advanced Technology/Therapeutic Development Award to reconstruct ear defects in animals using

EMR. Since EMR is a low risk, needle-based technology, it is amenable to endoscopic methods, potentially converting traditionally open operations used in major airway reconstructive surgery to a minimally invasive procedure. The article can be viewed through the CDMRP web page at <http://cdmrp.army.mil/dmrp>. ■

BLI Newsletter Staff

Editor: Bruce Tromberg
Writers: Elaine Kato, Erin Miller, Deborah Birnie
Layout & Design: Brian Hill

HONORS AND AWARDS

Michael W. Berns, Ph.D.

The Society of Photo-Instrumentation Engineers (SPIE) scheduled a special session in honor of the Beckman Laser Institute (BLI) co-founder Michael W. Berns as part of the annual meeting held on August 12-16, 2012. The session on August 13, chaired by Dr. Halina Rubinsztein-Dunlop of The University of Queensland (Australia), included an invited paper by Dr. Berns entitled "Laser tweezers and scissors: a photonic toolbox to study cells and their organelles." Papers by researchers from Germany, South Africa, South Korea, the United Kingdom, and Brazil, as well as the United States, were also presented.

Henry Hirschberg, M.D., Ph.D.

BLI Research Professor Henry Hirschberg has been awarded a seed grant from the Chao Family Comprehensive Cancer Center,

University of California, Irvine, for a pilot project entitled "Photochemical internalization (PCI) enhanced nonviral transfection of pro-drug activating genes: a potential treatment modality for gliomas."

Petra Wilder-Smith, D.D.S., Ph.D.

BLI Dental Director Petra Wilder-Smith has received a one-year grant from the University of California Research Coordinating Committee for a project entitled "Reversal of cancer-therapy-induced mucositis by human gingiva-derived mesenchymal stem cells."

Barbara Alcaraz Silva, B.S.

Developmental and Cell Biology graduate student Barbara Alcaraz Silva has been awarded a Ford Foundation Fellowship from the National Academy of Sciences. Barbara works in Dr.



Michael Berns' lab, and her project is entitled "Activation of DNA damage response (DDR) by double strand break (DSB) induction in mitotic telomeres."

Barbara Alcaraz Silva

Goutham Ganesan, B.S.

Medical Scientist Training Program (MSTP) student Goutham Ganesan has been awarded a National Institutes of Health (NIH) TL-1 fellowship by the UCI Institute of Clinical and Translational Science. Goutham's advisor is Dr. Pietro Galassetti, Associate Professor in the Departments of Pediatrics and Pharmacology, and both Goutham and Dr. Galassetti are collaborating with Professors Albert Cerussi and Bruce Tromberg at BLI on a variety

(Honors and Awards continued on p. 8)

Selected Recent Publications

"Photochemical internalization mediated delivery of chemotherapeutic agents in human breast tumor cell lines" by M.S. Mathews, V. Vo, E.-C. Shih, C.-H. Sun, S. J. Madsen and H. Hirschberg in *Journal of Environmental Pathology, Toxicology and Oncology* 31: 49-59, 2012.

"Dynamics of primary and secondary microbubbles created by laser-induced breakdown of an optically trapped nanoparticle" by Y. Arita, M. Antkowiak, V. Venugopalan, F. J. Gunn-Moore and K. Dholakia in *Physical Review E* 85: 016319, 2012.

"Head-up tilt and hyperventilation produce similar changes in cerebral oxygenation and blood volume: an observational comparison study using frequency-domain near-infrared spectroscopy" by L. Meng, W. W.

Mantulin, B. S. Alexander, A. E. Cerussi, B. J. Tromberg, Z. Yu, K. Laning, Z. N. Kain, M. Cannesson and A. W. Gelb in *Canadian Journal of Anaesthesia* 59: 357-365, 2012.

"An overview of clinical and experimental treatment modalities for port wine stains" by J. K. Chen, P. Ghasri, G. Aguilar, M. van Drooge, A. Wolkerstorfer, K. M. Kelly and M. Heger in *Journal of the American Academy of Dermatology* 67: 289-304, 2012.

"Effects of viscosity on sperm motility studied with optical tweezers" by N. Hyun, C. Chandsawangbhuwana, Q. Zhu, L. Z. Shi, C. Yang-Wong and M. W. Berns in *Journal of Biomedical Optics* 17: 025005, 2012.

"Photocoagulation of dermal blood vessels with multiple laser pulses in an in vivo microvascular model" by W. Jia, N. Tran, V. Sun, M. Marincek, B. Majaron, B. Choi and J. S. Nelson in *Lasers in Surgery and Medicine* 44: 144-151, 2012.

"High-resolution imaging of microvasculature in human skin in-vivo with optical coherence tomography" by G. Liu, W. Jia, V. Sun, B. Choi and Z. Chen in *Optics Express* 20: 7694-7705, 2012.

"Three-dimensional spheroid culture of human gingiva-derived mesenchymal stem cells enhances mitigation of chemotherapy-induced oral mucositis" by Q. Zhang, A. L. Nguyen, S. Shi, C. Hill, P. Wilder-Smith, T. B. Krasieva and A. D. Le in *Stem Cells and Development* 21: 937-947, 2012.

Notch (cont'd from p. 1)

our findings provide compelling evidence that pulling on Notch opens a network to deliver information that instructs specific cellular responses."

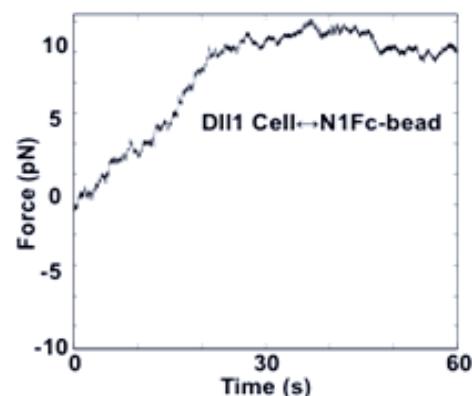
In its normal state, Notch is folded in an inactive form that protects its proteolytic cleavage (or enzymatic cutting site) that, once exposed, activates signaling in cells. Dr. Weinmaster likened the unfolding and activation of Notch by mechanical force to the force required to pull a pin from a grenade to produce an explosion. One of the interacting cells, known as the ligand cell (where a ligand is a molecule that binds specifically and reversibly to a molecule, e.g. Notch), uses mechanical force to pull the "pin" from the Notch grenade present on the other interacting cell, and this results in an explosion of sorts that sets off cellular programming by Notch. Dr. Weinmaster lacked the biophysical evidence that the ligand cells when bound to Notch actually produce mechanical force and that this force is dependent on ligand endocytosis.

Dr. Weinmaster contacted Dr. Botvinick, Assistant Professor of Biomedical Engineering and Surgery in the Beckman Laser Institute and The Edwards Lifesciences Center for Advanced Cardiovascular Technology, to

determine the exact role that ligand endocytosis serves in Notch signaling. Dr. Botvinick is an expert in optical tweezers, a scientific instrument that uses highly focused laser beams to detect and measure mechanical forces. Dr. Botvinick is leading the development of advanced laser microbeam technologies in BLI's NIH National Biomedical Technology Center, the Laser Microbeam and Medical Program (LAMMP, <http://lammp.bli.uci.edu/>).

"Optical tweezers act as tiny tractor beams that can hold and manipulate microscopic beads coated with specific molecules," said Dr. Botvinick. "When cells bind to and pull on the beads, researchers can measure cell-generated forces. To detect the pulling force, I recommended that we replace the Notch cell with a Notch bead that could be laser trapped and held just in contact with the ligand cell. If the cell produced mechanical force, it would displace the bead from the trap, allowing the exact magnitude of the pulling force to be measured." It was determined that an important role of ligand endocytosis is to generate mechanical force to activate Notch signaling.

Notch signaling has a role in processes such as neuronal function and development, stabilization of arterial endothelial fate and angiogenesis, organ develop-



Force exerted by Notch-ligand cells onto laser-trapped Notch beads over time.

ment during embryogenesis and regulation of cell communications in cardiac cells during the development of the endocardium and myocardium.

The two studies referred to in this article are: "Notch ligand endocytosis generates mechanical pulling force dependent on dynamin, epsins, and actin" by L. Meloty-Kapella, B. Shergill, J. Kuon, E. Botvinick and G. Weinmaster in *Developmental Cell* 22: 1299-1312, 2012; "Optical tweezers studies on Notch: single-molecule interaction strength is independent of ligand endocytosis" by B. Shergill, L. Meloty-Kapella, A. A. Musse, G. Weinmaster and E. Botvinick in *Developmental Cell* 22: 1313-1320, 2012. ■

OCT-US (cont'd from p. 3)

ed with high clinical morbidity and mortality. For over 20 years, intravascular ultrasound (IVUS) imaging has been a standard diagnostic tool for atherosclerosis. Recently, high-resolution optical coherence tomography (OCT) has been applied to intravascular imaging because it enables direct imaging of thin-cap fibroatheroma (TCFA). Pathological studies have revealed that TCFA is a prototypic vulnerable plaque which is characterized by (1) a large lipid pool and (2) an overlying thin fibrous cap. Heart attacks are mainly (86%) due to rupture of TCFA plaque in a coronary artery. No technology to date has demonstrated the

ability to identify all of the characteristic features of TCFA.

Professor Chen and colleagues are studying the premise that simultaneous IVUS-OCT imaging with a single integrated probe is more sensitive and precise in evaluating vulnerable plaque. The integrated IVUS-OCT system provides high resolution for imaging the thickness of the fibrous cap and deep penetration for imaging the entire lipid pool at the same time. Jiawen Li, a Ph.D. candidate in Dr. Chen's OCT lab, and Dr. Xiang Li in the USC lab, who has expertise in ultrasound imaging, built the integrated system, the OCT-IVUS catheter, and developed software for processing OCT-IVUS data. So far, they

have been able to demonstrate *in vivo* imaging of atherosclerotic plaque in a rabbit abdominal aorta, as well as *in vitro* in a cadaver human coronary artery. They have also been the first group to show the safe use of this integrated catheter in a swine model, which is commonly used prior to *in vivo* human research.

The investigators hope to begin testing this integrated system soon in clinical studies. The unique performance of the OCT-IVUS catheter could improve the ability of cardiologists to identify and characterize vulnerable plaques, a much-needed advance that could potentially help reduce sudden heart attacks in high-risk patients. ■

Arrivals and Departures

ARRIVALS

Michelle G. Arnold, LCDR MC USN, is a Facial Plastic Surgery Fellow who will be working in Dr. Brian Wong's lab studying injectable filler imaging for rhinoplasty and laser scar protocols. Dr. Arnold is also an active duty U.S. Navy officer.



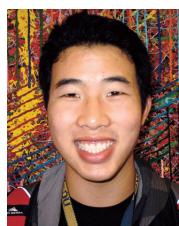
Michelle Arnold

Alex Jabbari has been hired as a Jr. Specialist working under the guidance of Dr. Robert Brown on 3D imaging in endoscopy.



Alex Jabbari

Ben Lertsakdadet has been hired as a Jr. Specialist in Dr. Bernard Choi's lab and will work on surgical and imaging experiments.



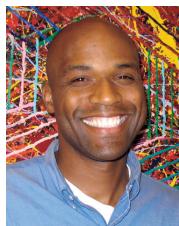
Ben Lertsakdadet

Ryan Manz, M.D., has joined Dr. Brian Wong's lab as a Facial Plastic Surgery Fellow who will be working on injectable filler imaging for rhinoplasty and laser scar protocols.



Ryan Manz

Ya-Sin Peaks, M.D., is joining Dr. Brian Wong's lab as a postdoctoral fellow who will be imaging subglottic stenosis in neonates. Previously, Dr. Peaks was a U.S. Army and Marine helicopter pilot who flew missions in Bosnia, Afghanistan and Iraq.



Ya-Sin Peaks

Special Departure: Midge Garrison

Midge Garrison was hired as the Management Services Officer (MSO) of the Beckman Laser Institute (BLI) in 2005. Previously, she was the MSO of Contracts, Marketing and Public Relations at the University of California, Irvine Medical Center from 2002-2004.



Midge Garrison

Midge retired at the end of June this year. She will keep busy by working part-time on special BLI projects, taking classes in jewelry making, and traveling (she recently returned from the Napa Valley and has plans to visit Marco Island, Florida). But the most rewarding activity she is looking forward to is being the Troop Leader of 11-year-old granddaughter Kaily's Girl Scout troop. This will be the perfect "job" for Midge because as MSO at BLI, she made everyone feel comfortable and part of the team.

Shohreh Zamir

Shohreh Zamir has been hired as Academic Personnel/Human Resources Payroll Manager for the Beckman Laser Institute effective August 1, 2012. Shohreh has a B.A. in Business Administration from Northwest Missouri State University. She previously worked at the UCI School of Medicine Academic Affairs Office.



Shohreh Zamir

DEPARTURES

Rajan Arora, B.S., who worked in Dr. Bernard Choi's lab was accepted into the medical school of George Washington University in Washington, DC.

Matthew Ficinski, M.S., received a Master's in Biomedical Engineering and left to attend Jagiellonian University Medical College in Krakow, Poland. He worked in Dr. Michael Berns' lab.

Dongjo Hwang, M.D., Ph.D., a Visiting Researcher from Doori ENT Network of Korea and the Laser Institute at Dankook University has returned to

Korea after two years spent collaborating with Dr. Brian Wong.

Soren Konecky, Ph.D., has taken a position as Sr. Scientist at PerkinElmer in Alameda, CA. He will be studying optical imaging for cancer detection.

Katherine Nielsen, B.S., who worked in Dr. Bernard Choi's lab, is going to medical school at the University of Arizona.

Darren Roblyer, Ph.D., accepted a faculty position, Assistant Professor of Biomedical Engineering, at Boston University.

Eren Taydas, M.D., has begun a Residency in Internal Medicine at the University of Maryland, Baltimore, MD.

Wei Wei, Ph.D., who worked in Dr. Zhongping Chen's lab, has accepted a faculty position as Assistant Professor at the Shenzhen Institute of Advanced Technology in China.

Tao Wu, Ph.D., completed his post-doctoral fellowship in Dr. Michael W. Berns' lab and has left to pursue other professional opportunities.



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Honors and Awards *(cont'd from p. 5)*

of projects. The focus of the fellowship research is "The use of Diffuse Optical Spectroscopy in vascular disease and adipose tissue dysfunction." The award supports tuition, stipend, and travel expenses for up to two years.

Ryan Leary, B.A.



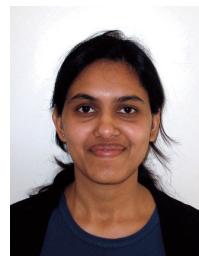
Ryan Leary

Third year UC Irvine medical student Ryan Leary has received funding from the 2012 Institute for Clinical and Translational Science (ICTS) Mentored Medical Student Program

which will pay all tuition costs and fees for the Master of Science Program in Biomedical and Translational Science (MS-BATS). MS-BATS, in its inaugural year, is a program designed to address the acute need for researchers trained to

meet the increasingly sophisticated demands of the clinical research environment. Ryan will be working with Dr. Brian Wong on two projects: utilizing optical coherence tomography (OCT) to directly visualize and assess the upper airway of intubated neonates and constructing an accurate 3-dimensional model of the upper airway in the adult.

Richa Mittal, B.S.



Richa Mittal

Chemical Engineering and Materials Science graduate student Richa Mittal has been awarded a 2012 Student Research Grant from the American Society for Laser Medicine and Surgery for "A minimally-invasive approach to the challenge of oral neoplasia." Richa works in Dr. Petra Wilder-Smith's lab.

Austin Moy, B.S.

Biomedical Engineering graduate student Austin Moy, who works in Dr. Bernard Choi's lab, has received a University of California, Irvine Graduate Dean's Dissertation Fellowship.

Lauren Law



Lauren Law

Biological Sciences undergraduate student Lauren Law has been notified that her project, "Investigating the change in women's lip size by measuring frontal views of faces from Vogue magazine," has earned Excellence in Research in the Biological Sciences from the Honors Committee. Her final paper will be published in the online *Journal of Undergraduate Research in the Biological Sciences*, 2011-2012. Lauren worked in Dr. Brian Wong's lab.