

CHEMISTRY & BIOCHEMISTRY

CALIFORNIA STATE UNIVERSITY, LONG BEACH • FALL 2013



Lab Courses Prepare Students for Careers

By Drs. Chris Brazier, Xianhui Bu, Ken Nakayama, Kasha Slowinska, Kris Slowinski and Paul Weers

A key feature of a scientific process is that it results in laws and theories that must be verified by observations. Consequently, an inquiry-driven laboratory continues to be an irreplaceable element of a solid education in the sciences. In an era of increased reliance on web-based instruction, computer simulations and distance learning, it is important to appreciate the central role of laboratory practice in the education of chemists and biochemists. Our Department of Chemistry and Biochemistry is lucky to have two modern science buildings providing excellent opportunities for world-class laboratory work.

Our laboratory curriculum is designed to provide hands-on training in the use of modern chemical instrumentation to reinforce and verify theoretical ideas and concepts learned in lectures, and to develop and improve students' skills in problem solving, teamwork, scientific writing and data analysis.

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Cover photo: Wendy Beck at work in Dr. Paul Weer's lab.

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Dr. Laura Kingsford

Message by the Dean

It's hard to believe we have been in our "new" Hall of Science for two years now. It feels like home and is a great place to work, teach, do research and learn. You can still be a part of it by having your name attached to the state of the art facility. Please see <https://giveto.csulb.edu/hallofscience/> to name a seat in one of the first-floor lecture halls and to be part of the next era in science teaching and research at CSULB. Only 430 seats remain among the four lecture halls, and when they are gone, the opportunity is gone forever.

Our ongoing top priority is student success, and our faculty and staff work hard to ensure that this happens. In some cases, this means looking at courses where students struggle to succeed and making changes to enhance student engagement and learning. Some of our faculty are working on "flipped" lectures. This means students now view some lecture or lab materials outside of class via BeachBoard. Then, during class, the instructor can ask questions to assess learning, review tough concepts/problems and have students work together in groups to solve problems, discuss questions, review lab materials, carry out experimental work or explore additional ideas/concepts. This type of student engagement has been shown to lead to higher grades and longer retention of the materials learned. This is particularly important for the sciences and math, where students need to build on concepts, skills and their knowledge base as they move on to the next courses in their program.

In fall 2011, we started a STEM Faculty Learning Community, led by college faculty and the Faculty Center for Professional Development director. Ten faculty members are invited to participate each semester. They read relevant material (geared towards math/science teaching) and engage in conversations via our BeachBoard, where they ask questions, discuss concerns/problems in teaching, propose ideas, get feedback, etc. They are required to make changes to their syllabus and their teaching the following semester. The results of their work have been outstanding, and we are seeing major improvements in the success of students in specific courses.

This year, the Chancellor's Office funded initiatives where faculty teams from a campus work with teams from other campuses on proven and promising course redesigns. That means we have faculty who will attend workshops on other campuses to learn more about courses that have been successful. Our teams then work on implementing some or all of the changes in their courses here. For us, real recognition of our faculty success came when the Chancellor's Office selected our general chemistry course as "a 'proven course' where redesign of it has been highly successful."

One of the things I love about this college is working with all the faculty and staff. They are a truly dedicated group of individuals who work hard to help students succeed. Student success is a priority also shared by our friends and alumni in the community. We thank you—faculty, staff, students, alumni and friends—who have contributed in some way. Your support helps make it possible to provide the quality programs for our students so they leave CSULB with highly valued degrees.

—Dean Laura Kingsford

Remarks by the Chair

Dear Alumni and Friends:

I have always felt that one of the most fulfilling aspects of being a department chair is the opportunity to facilitate and encourage success of our students, faculty and staff.

I am very proud of our students who were recognized for their academic and community service achievements. I am especially delighted that Tuyen Ngoc Tran, a B.S. biochemistry major, was named the 2013 Outstanding Graduate for the College of Natural Sciences and Mathematics by the CSULB Alumni Association.

Our faculty members continued to strive for excellence in teaching, research and service. We have continued to improve our teaching through innovations in pedagogy and increased emphasis on advising. One example of such activities is our reform of the general chemistry curriculum, led by Dr. Shahab Derakhshan and recently selected by the CSU Chancellors Office as a "proven example of successful course redesign."

The department's research productivity and grant support are at an all-time high. This past academic year, our faculty published 46 research papers in some of the top journals, including *Science* and the *Journal of the American Chemical Society*, and generated significant new external grant support. Just recently, an eight-member team of faculty (Drs. Buonora, Li, Marinez, Nakayama, Mezyk, Schwans and Shon), led by Dr. Michael Schramm, received a grant from the National Science Foundation for acquisition of a 400 MHz NMR instrument. This is truly great news as the new NMR will significantly improve our research and teaching capabilities. Last, but not least, two of our faculty were honored with campus-wide awards: Dr. Vasanthy Narayanaswami, who was named the 2013 Most Valuable Professor by the CSULB Alumni Association; and Dr. Young Shon, who was the recipient of this year's CSULB Distinguished Faculty Scholarly and Creative Achievement Award.

In spring 2013, the department underwent external and internal program reviews. I am delighted to report that both reviews "found much to praise in the activities and accomplishments of the Department of Chemistry and Biochemistry during the review period" and emphasized the "extraordinary measures" that the department took to address concerns expressed in our previous evaluation conducted in 2006. This successful evaluation would not have been possible without the hard work of our previous chairs, Drs. Douglas McAbee and Jeffrey Cohlberg, who provided outstanding leadership and facilitated effective collaboration within the department.

I am very pleased to welcome our newest faculty member, Dr. Enrico Tapavicza, who has accepted our offer to join the department as an assistant professor of physical chemistry. Dr. Tapavicza holds an M.S. degree from the University of Bayreuth, Germany, and a Ph.D. from the École Polytechnique Fédérale de Lausanne (EPFL), Switzerland. He will be joining the department following postdoctoral work with Dr. Filipp Furche at the Department of Chemistry, UC Irvine.

We have also recently hired two new staff members: Jeffrey Cox, who joined us in April as a full-time departmental equipment technician; and Cynthia Ybarra, who was hired as an instructional support technician in our Issue Room, replacing Bertha Macias, who resigned to relocate with her family to Texas.

As always, I would like to thank our alumni and friends for their support and help. Your support is critical to the success of our department!



Dr. Krzysztof Slowinski

—Dr. Krzysztof Slowinski

Department Receives NSF Grant for 400 MHz NMR

By Dr. Michael Schramm

On July 17, the Department of Chemistry and Biochemistry received news that their grant submission to the National Science Foundation (NSF) for a new 400 MHz nuclear magnetic resonance (NMR) spectrometer was successful (CHE-1337559)!

The requested instrument has the most up-to-date technologies, including a multinuclear broadband probe that can be auto tuned, matched and shimmed. The range of nuclei that this probe supports is exhaustive, and many faculty will immediately use this instrument to acquire B, P, F, Si and Cl NMR spectra. Additionally, the instrument includes a 24-station auto-sampler that will dramatically improve student access and deployment of more complex and sequential experiments without the need for scheduling late night or weekends. The software is capable of running samples after hours, regardless of nuclei or acquisition conditions. Since students can simply "walk up" to the instrument and submit any sample at any time, it alleviates the problem of time limits due to coursework or conflicting time based on heavy user demand.

The instrument will replace the department's current 400 MHz NMR spectrometer that lacks these modern features and will complement our recently acquired (fall 2012) 300 MHz NMR with auto sampler. The new 400 and 300 run on the same software platform, which will dramatically simplify the training regimen for new users as well as expand the options for experiments.

The 300 has served CHEM 420 and CHEM 320 teaching labs, and will continue to support research activities for students to rapidly determine purity of samples and for routine H and C NMR characterization of simpler molecules. Our new 400 will be housed in the newly constructed Hall of Science NMR facility and be deployed with more exotic compounds and materials. The multinuclear capabilities, along with the capacity for a full repertoire of 2-D experiments, will give students access to the most modern features of NMR spectroscopy. In addition, the requested instrument is fully capable for future upgrades to both triple channel and cryoprobe technologies, allowing for multiple upgrade pathways as new department needs arise.

Dr. Michael Schramm led the grant writing team, which included co-PIs, Drs. Paul Buonora, Lijuan Li, Eric Marinez, Stephen Mezyk, Ken Nakayama, Jason Schwans and Young Shon.

Lab Courses Prepare Students for Careers

Continued from pg. 1

In addition to standard general chemistry and quantitative analysis laboratories, the department offers six upper division laboratory courses designed for our majors (introductory organic, advanced organic, physical, analytical, inorganic and biochemistry).

Introductory Organic Chemistry

The introductory organic chemistry laboratory is designed so that students develop both practical and theoretical expertise in distillation, extraction, thin layer and gas chromatography, unknown identification, IR and NMR spectroscopy, and everyone's favorite, recrystallization. These fundamental techniques, once learned, are then routinely applied to chemical reactions that focus on the material in the corresponding lecture course. Students carry out aromatic nitration reactions, prepare and use organometallics in a Grignard experiment and do several condensation reactions with carbonyl compounds. The final experiment that students execute is a laboratory practicum, during which on the final day they arrive and receive an experiment to be conducted in one lab period—including isolation and analysis—along with detailed questions about the reaction at hand. In the end, students are well prepared for the biochemistry laboratory, instrumental methods and the advanced organic laboratory courses.



Jessica Kyees (left) and Patricia Nguyen.

Inorganic Chemistry

The inorganic chemistry laboratory consists of six experiments designed to help students learn critical laboratory skills in both inorganic synthesis and characterization techniques such as magnetic susceptibility measurements, UV-Vis and IR spectroscopy. These techniques are used to solve chemical problems and to understand phenomena unique to inorganic chemistry. Furthermore, experiments are chosen to cover a broad range of fundamental chemical principles, such as hard soft acid-base concept, isomerism in metal complexes and ligand-field theory, to help students build a solid foundation in inorganic chemistry.

Physical Chemistry

The physical chemistry lab provides students with an opportunity to experience firsthand the concepts introduced in lectures. The important notions of thermodynamics and quantum mechanics are hard to demonstrate, and a

hands-on experience greatly increases student understanding. Students work together in pairs to perform experiments in classical thermodynamics, kinetics, quantum mechanics and spectroscopy. We typically begin with a group kinetics/equilibrium experiment, where each group performs the experiment at a different temperature. Students pool their data so that they can extract information on activation energy and enthalpy of reaction. For the remainder of the semester, each pair rotates between the remaining six experiments. A second kinetics lab explores the rate order and effect of ionic strength in the classic iodine clock reaction. Two thermodynamics experiments explore heat of combustion of maleic and succinic acids and heat of vaporization of toluene.

Students use spectrophotometry to explore either the acid-base equilibrium of methyl red or formation of a complex between iodine and mesitylene. The last two experiments investigate the quantum yield for fluorescence of fluorescein

and the infrared vibration-rotation spectrum of HCl. An important feature of most experiments is learning how to properly determine the error in the results and to use advanced features of Excel, such as linear regression, and Solver for a least squares analysis.

Advanced Organic Lab

The advanced organic lab course introduces students to experiments encompassing several laboratory techniques students learned in the first semester organic lab. The course is focused on the use of spectroscopic techniques, mainly NMR and GC/MS, to elucidate the structure, establish chemical and stereochemical purity, and study conformational properties of organic compounds. In mass spectrometry, the theory, major fragmentation pathways and peptide sequencing are discussed. In NMR, we discuss coupling constants, diastereotopic nuclei, DEPT and 2-D NMR techniques.

formed include peptide coupling, aldol reaction in the presence of a Lewis acid, synthesis of organophosphates that are enzyme inhibitors, and the Wittig reaction to synthesize various conjugated compounds for UV spectroscopic studies. The students work up all of their spectroscopic data and see firsthand the status and purity of their products. Students also present a short talk on a paper from the literature related to organic synthesis or synthetic methods.

"An important feature of most experiments is learning how to properly determine the error in the results and to use advanced features of Excel, such as linear regression, and Solver for a least squares analysis."



Roy Hernandez (left) and Gabriel Nesbitt.

The second half of the semester is devoted to the discussion of modern synthetic methods and examples of asymmetric synthesis from the literature. Students carry out reactions under inert gas conditions and perform chromatographic purification of crude products. Through the experiments they perform, students explore issues in stereoselectivity, conformational analysis, the partial loss of stereochemical integrity during a peptide coupling reaction and the synthesis of enzyme inhibitors. The reactions per-

Instrumental Analysis

The instrumental analysis laboratory is designed to familiarize students with modern laboratory techniques and to develop specific skills used in the practice of chemistry in the modern setting. The laboratory consists of hands-on tutoring sessions (electronic components and statistics-factorial design) and six rotation experiments, each two weeks long. The experiments are centered on the following techniques: spectrophotometry (building, test-

ing and characterization of the UV-VIS spectrophotometer from electronic components), HPLC (separation of caffeine and salicylic acid), GC-MS (separation of gasoline components and statistical data analysis), fluorescence (analysis of PAHs), electrochemical methods (detection of dopamine and fluoride in drinking water) and ICP-OES (analysis of animal and human teeth).

Biochemistry

The biochemistry laboratory is a one-semester course typically taken by biochemistry majors in their senior year, following two semesters of biochemistry lecture. The course aims to provide students with a thorough understanding of the chemical principles underlying modern biochemical and molecular biological laboratory techniques and instrumentation, and to enhance their problem solving, data analysis, scientific writing and data presentation skills.

The course is organized as three modules. A protein biochemistry module includes protein assays, size-exclusion and ion exchange chromatography, UV-Vis spectroscopy, gel electrophoresis and Western blots. In the enzyme kinetics module, the students determine the Michaelis-Menten constants of an enzyme and investigate its substrate specificity and the effects of reversible and irreversible inhibitors. In the module on molecular biology, the students isolate a plasmid and characterize it by restriction analysis; they use the plasmid to make a hybridization probe by PCR and use the probe in a Northern blot analysis of RNA isolated from brine shrimp.

Last, the students acquire a basic knowledge of proteomic analysis. They isolate a protein spot from a 2-D gel, perform a mass spectrometric analysis of a tryptic digest of the protein, using the College's MALDI-TOF mass spectrometer, and identify the protein by querying the database. The course concludes with a poster session, which provides an opportunity for the students to present one experiment from the course in a poster format to foster communication and presentation skills.

Dr. Gene Kalbus

By Dr. Nail Senozan (1931-12)

Dr. Gene Kalbus, a former faculty member in our department, passed away in December 2012 after a brief struggle with pancreatic cancer. He was 81. Once every six months or so, I used to join Gene and Dr. Van Lieu for lunch at some fast food place. We had lunch at a Subway restaurant in late June 2012, and when the time came for our next gathering, he was gone.

Gene joined the department in 1957 as a freshly minted 26-year-old Ph.D. from the University of Wisconsin. He taught analytical chemistry (CHEM 251 and 451) until his retirement in 1999. For almost half a century, all graduates of our department took an analytical chemistry course either taught or designed by Gene Kalbus. Several of the experiments developed by him, often in collaboration with Dr. Lieu, were published in the *Journal of Chemical Education* and adopted into the chemistry curriculum across the United States. Outside the classroom, Gene ran an energy institute for many years that was sponsored by Southern California Edison for high school teachers. The institute took the participants to sites of energy generation and disposal (nuclear) across California and Nevada.

Gene was a man of precision in his work as well as in his ordinary speech. He had little patience with loose talk or sloppy selection of words. His razor sharp humor and uncanny ability to sift through fluff and reach the essence of any situation did not surface immediately, and he gave perhaps the impression of being reserved and shy. We were assigned adjacent offices, and for many years, our interaction did not go beyond a polite exchange of greetings. Gradually, however, I realized how fortunate I was to be the office neighbor of this sensitive and intelligent person. We became friends and travelled locally and internationally; he took me to interesting places around Los Angeles, and I guided him through Macedonia, Greece and Istanbul. During the summer of 1986, we went to Mazatlan, and I remember with appreciation his watching over me to make sure that I wasn't going to do anything foolish at midnight in the Pacific Ocean.

Gene is survived by his daughter, Terry; sons, Jimmy and Randy; and his beloved brother and fellow analytical chemist, Lee.

2013 Allergan Foundation Distinguished Visiting Lecturer:

Ronald M. Evans

The Salk Institute

By Dr. Jeff Kohlberg

Dr. Ronald M. Evans, holder of the March of Dimes Chair in Molecular and Developmental Biology at the Salk Institute, visited the department on Feb. 20 as the Allergan Foundation Distinguished Visiting Lecturer. Evans is renowned for his research in the area of nuclear hormone receptors and their involvement in the control of metabolism. In 1982, his lab cloned the gene for the glucocorticoid receptor and subsequently discovered that it was a member of a new family of more than 50 nuclear receptors that bind a wide variety of steroids and other hormones. These receptors control the activity of



Dr. Ronald M. Evans

genes involved in regulating sugar, salt, calcium and fat metabolism. They are primary targets in the treatment of breast cancer, prostate cancer and leukemia, as well as osteoporosis and asthma.

Evans's many awards and honors include the 2004 Albert Lasker Award for Basic Medical Research (shared with Pierre Chambon and Elwood V. Jensen), 2005 Glenn T. Seaborg Medal, 2006 Harvey Prize and many others, most recently the 2012 Wolf Prize in Medicine, Israel's highest award for achievements benefitting mankind. He is a member of the National Academy of Sciences and a fellow of the American Academy of Arts and Sciences. In addition, he serves on the editorial board of *Cell Metabolism*; *Cell*, *Genes and Development*; *Cell Press*; and *Cold Spring Harbor Press*. As the founder and chair of the Scientific Advisory Board of Ligand Pharmaceuticals, he also serves on scientific advisory boards of several prominent medical research institutions.

Evans gave two lectures during his visit. The lecture for a general audience was titled "Can Exercise Mimetics Substitute for Exercise?" He described studies with the compound AICAR (aminoimidazole-carboxamide ribonucleotide) and its use as a substance that confers many of the metabolic benefits of exercise. AICAR is a naturally occurring substance, an intermediate in purine biosynthesis, which serves as a potent activator of AMPK (AMP-activated protein kinase). AMPK is often regarded as a master switch of metabolism that senses low levels of ATP energy reserves and triggers metabolic pathways that burn fuels and replenish energy stores, while shutting off pathways that store energy as glycogen and fat. Mice treated with AICAR have better performance on exercise tests, and are more resistant to weight gain and less susceptible to developing the metabolic syndrome associated with diabetes. AICAR may be useful in treating people who cannot exercise, like those with disorders like muscular dystrophy, and in treating and preventing type 2 diabetes.

Evans also presented a research seminar, "Nuclear Receptors and the Hunger Game: From Feast to Famine." The principal focus was the Evans lab's recent discovery that a protein called fibroblast growth factor 1 (FGF1) plays a key role in regulating the metabolism of sugar and fat. This member of the large FGF family was thought to have no function because animals lacking FGF1 appeared to be normal. But FGF1-deficient mice are highly susceptible to developing inflammation of fat tissue and consequently a severe form of diabetes when given a high-fat diet. Evans's lab found that FGF1 is an essential component of the pathway by which insulin leads to increased storage of excess glucose as fat and that synthesis of FGF1 is regulated by a well-studied receptor called PPAR- γ .

This event was funded by a grant from the Allergan Foundation. We are grateful to the Allergan Foundation for their continued support of the Distinguished Visiting Lecturer program, which annually gives our students and faculty the opportunity to hear and interact with a distinguished researcher in chemistry or biochemistry.



Tuyen Tran Named College's Outstanding Graduate

Tuyen Tran, who graduated this past spring with a B.S. in biochemistry, was selected as the 2013 Outstanding Graduate of the College of Natural Sciences and Mathematics. Tran is a research student in Dr. Vasanthy (Vas) Narayanaswami's lab and is first author of a recent publication in *Archives of Biochemistry and Biophysics* describing the biochemical and biophysical characterization of recombinant rat apolipoprotein E3.

Tran has also studied the effect of acrolein in secondhand smoke on apolipoprotein E. He has given eight talks and presented 14 posters at research conferences, including meetings of the American Society for Biochemistry and Molecular Biology (ASBMB); Arteriosclerosis, Thrombosis and Vascular Biology Scientific Sessions; the Biophysical Society; and the Tobacco-Related Disease Research Program. His poster at the 2013 ASBMB meeting, "Acrolein, a component of tobacco smoke and age-related oxidative stress disrupts structure and function of apolipoprotein E.," was named Thematic Best Poster in the category of Lipids and Membranes.

A recipient of many scholarships and awards, Tran was recently elected to Phi Beta Kappa. He was the founder of the Chemistry and Biochemistry Graduate Student Association and has been active in many student organizations. In addition, he has served as a tutor at the Jensen Student Access to Science and Math Center and has been a volunteer for the American Cancer Society and St. Joseph's Hospital.

Tran received his Outstanding Graduate award at the spring Alumni Association Awards Banquet, where he presented Narayanaswami the award for Most Valuable Professor.

Vas Narayanaswami Teaches Real-World Research

By Rick Manly

When the Department of Chemistry and Biochemistry's Dr. Vasanthy (Vas) Narayanaswami was named by 2013 CNSM Outstanding Graduate Tuyen Tran as his Most Valuable Professor, it was the latest recognition of excellence for the distinguished faculty member.

Narayanaswami's enthusiasm for pursuing research and for teaching her students to conduct real-world research with her in studying the structure and behavior of apolipoprotein E (apoE), led to the distinction in 2011 when a project in which she participated with her collaborator in Belgium was named Paper of the Year by *Biochemical Journal Structure*. The paper, entitled "Antiparallel beta-sheet: A signature structure of the oligomeric amyloid β -peptide," reports on the conformation of the toxic oligomeric form of the beta amyloid peptide, which is found in plaques in the brains of patients with Alzheimer's disease.

"I'm very happy to be part of this study," she said. "ApoE is a protein found in our blood and in the brain, which plays a critical role in cholesterol transport. It is important that we understand the function of this protein to combat the No. 1 and No. 6 killers, heart disease and Alzheimer's disease, respectively, in the U.S. and across the world. ApoE and cholesterol are intrinsically linked to both these diseases. I am pleased to be training the future generation of researchers, doctors, academicians and other health related professionals who will be challenged with the devastating consequences of these diseases."

Narayanaswami comes to CSULB from the Bay Area, where she currently holds a position as an associate scientist at the Children's Hospital Oakland Research Institute and co-directs CHORI's Summer Student Research Program. She joined CSULB in 2008.

Narayanaswami is also the program director and principal investigator at CSULB for the successful five-year renewal of a grant from the National Institutes of Health's Minority Access to Research Careers Undergraduate Student Training in Academic Research program. The overall aim of this \$1.25 million project is to continue increasing the number of underrepresented students entering and earning doctorates in biomedical and behavioral sciences.

"This has been a passion of mine right from day one," she said. "One of the keys to student success is giving them good mentorship and a rich research environment. The idea is to identify student aptitude in biomedical research and enrich and strengthen their research skills."

Narayanaswami looks for resilience in her trainees. "Things don't always work in a research lab. So when things don't work, I want students who will be able to bounce right back," she said. "I want students who won't give up. I always look for the 'I may be down but not out' spirit. It builds their competitive nature, which is crucial for anyone going into science now. They can't just sit back and wait for things to happen."

Narayanaswami offers a real-world level of stress to her students. "My lab is always on the go," she said. When they are not in the class or cramming for exams, the research students in her lab are involved in critical thinking, inquiry based research, collecting data, analyzing results, manuscript or conference submissions, grant or scholarship applications—the list goes on and on.

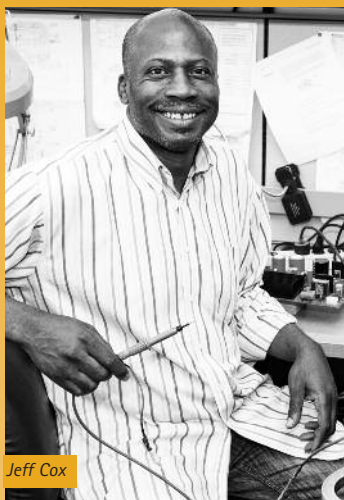
Narayanaswami is glad she chose CSULB. "I would choose this campus again in a heartbeat," she said. "It gives me a chance to make a difference in people's lives through research, one student at a time."



Dr. Vas Narayanaswami

"One of the keys to student success is giving them good mentorship and a rich research environment. The idea is to identify student aptitude in biomedical research and enrich and strengthen their research skills."

—Vas Narayanaswami



Jeff Cox

Department Hires New Electronics Technician

By Dr. Paul Buonora

We are happy to introduce the readers to our new electronics technician, Jeff Cox. Jeff has electronics training and was a part-time employee in the college machine shop before being selected to become the department's full-time technician. As part of his duties he will repair, maintain and calibrate the many instruments in the department and will help in the design and building of electronics equipment needed to support the department's teaching and research.

Many alumni will remember Bob Soukup, who was the electronics technician in the department for many years. Since his retirement, during the recent difficult budget period, we were without an electronics technician. The department and college made finding and funding a new technician a priority, which became a reality with the new funding available as a result of the voter-approved tax increase in last year's election.

When not working through the backlog of electronics repairs, Jeff is an active leader of Long Beach Boy Scout troop #516, an evangelist and a church member. He also works with kids and is involved in feeding the homeless.



Shedding Light on Light

By Anne Ambrose

Light is among the fundamental factors that make many biological and technological functions possible, so understanding its role is an essential part of science. And it's the primary interest of Assistant Professor Enrico Tapavicza, who joined CSULB's Department of Chemistry and Biochemistry faculty this fall.

"I'm interested in photochemistry and molecular photophysics, which is everything that happens when molecules absorb light or some type of energy. I'm interested in biological systems, in systems that are interesting for technology such as solar cells, and science fiction things like light-driven molecular motors," said Tapavicza, who completed his postdoctoral work this year in the UC Irvine (UCI) lab of Dr. Filipp Furche.

One aspect of his attention is the photochemistry of vitamin D. "Depending on the color of the light absorbed by the vitamin D precursor, different derivatives of the molecule are formed. We know very little about the biological function of this complex photochemical system," he said.

Vitamin D is essential for a variety of bodily processes—most notably it controls calcium absorption, but it also functions as a regulator of blood pressure and even as a cancer inhibitor. Many other biological processes depend on photochemical reactions. For example, an organism's circadian rhythm is controlled by the photochemistry of melatonin, but the absorption of light by medications can also mediate unwanted side reactions in our body.

"I study photochemical processes by computer simulations using molecular dynamics," Tapavicza explained. "In the last 20 years, there was major progress in developing quantum mechanical theories to describe molecules in excited states. Before, it was computationally too demanding to do such simulations.

"In molecular dynamics, the motion of a molecule is propagated in time, but it happens differently if a molecule is in the ground state or if it gets excited by light. The result of such a simulation is a molecular movie that contains detailed information of the mechanism of the photochemical reaction," he said.

Tapavicza and his colleagues have developed computer programs for simulating fairly large molecules through non-adiabatic dynamics. "The hope is that we can simulate larger systems in the future. There are lots of studies of small model systems for academic purposes, but the systems interesting for biology and technology are far more complex and involve large molecules or assemblies of molecules. To study these types of systems you need more computer power or more efficient algorithms.

"We are now at a stage where we can switch to larger systems and treat molecules in a chemical environment," he continued. "For example, this allows us to describe a photochemical reaction in solution or in a biological environment like a protein or a cellular membrane. The chemical environment can have a large influence and is often crucial for the outcome of a photochemical reaction."

Furthermore, "The nice thing about our theory and the developed simulation techniques is that we can use them to study both biological systems and systems for technological applications. In particular, our methods can be used to study mechanisms of solar energy conversion and help to develop more efficient solar cells."

The German native did his undergraduate work in Munich and Bayreuth before completing his Ph.D. at the École Polytechnique Fédérale de Lausanne, Switzerland. He then received a Swiss Science Foundation fellowship to study at UCI, where he worked at two National Science Foundation-funded facilities—the Chemistry at the Space-Time Limit Center and the Atmospheric Integrated Research (AirUCI) unit.

When he's not in the lab, Tapavicza enjoys getting out into the sunlight, especially when rock climbing and surfing.

Alumni Giving Makes a Difference!

YOUR DONATIONS AT WORK

14 Student Research Travel Awards

Fourteen undergraduate and graduate students received awards of up to \$500 each in support of their participation in national and international meetings.



Malinda S. Tan presented her poster "Two Dimensional Magnetism in the Novel B-site Ordered Double Perovskite; $\text{Ca}_2\text{MgOsO}_6$ " at the North American Solid State Chemistry Conference, 2013.

14 Departmental Honors and Special Awards

For outstanding service, teaching associate, thesis, baccalaureate and post-baccalaureate candidates.

9 Scholarship Awards

Ranging from \$1,000 to \$5,000.

8 Summer Research Awards

Supported students in 10 weeks of faculty-mentored summer research.



25 Seminars by Distinguished Visiting Scientists

From such prestigious institutions as Caltech, UCLA, USC, UCI, UC San Diego, UC Santa Barbara, Scripps Institute, San Diego State, University of Pennsylvania and the J. Craig Venter Institute.

Dr. Ronald Evans of the Salk Institute made two presentations as the Allergan Foundation Distinguished Lecturer.

YOU CAN MAKE THE DIFFERENCE IN 2013-14!

Your gifts determine how rich an educational experience we can provide to our students. The department relies exclusively on private contributions to support these key educational enrichment activities for students:

- Summer Research Program
- Student Research Travel Fund
- Department Awards and Scholarships

Please use the enclosed envelope or give online at www.csulb.edu/givenow to enrich the life of a student by supporting one of the department priorities above. Your gift really does make a difference!

CSULB Among Top Campuses in Applications, International Enrollment

U.S. News & World Report recognized Cal State Long Beach as among the nation's top 10 colleges receiving the most applications from first-time freshmen.

Using fall 2011 admissions data, CSULB ranked No. 5 with 49,767 first-time freshmen applications. The others were national universities, including No. 1 UCLA (61,564 applications).

Former CSULB President F. King Alexander noted the campus would probably rank even higher if fall 2013 first-time freshmen applications (56,213) were used. Overall, CSULB received 82,026 total undergraduate applications and 2,798 graduate and credential applications for fall—the highest among all 23 CSU campuses.

Moreover, a *Chronicle of Higher Education* article cited CSULB as No. 2 nationally among master's institutions that enroll international students, based on the latest "Open Doors" report from the Institute of International Education.

CSULB enrolled 2,563 international students during 2011-12, including more than 325 from Saudi Arabia, followed by India, China, Korea and Japan.

CSULB Remains a Best Value

Cal State Long Beach was again named to the *Kiplinger's Personal Finance* list of the top 100 best values in U.S. public colleges.

CSULB has appeared in the report multiple times, this year at No. 82, up from No. 98 last year. Schools were ranked according to academic quality, incoming freshmen test scores, admission and retention rates, student-faculty ratios, and four- and six-year graduation rates. The editors then ranked each school based on cost and financial aid.

In addition, *Kiplinger's* ranked CSULB No. 2 among U.S. public colleges for the lowest debt at graduation, with an average debt for its graduating students at \$12,401.

Former CSULB President F. King Alexander noted that the *Kiplinger* ranking demonstrates that high price tags of many institutions have little to do with the quality of their education.



Faculty Reports

Dr. Roger Acey

We've had a very exciting year, and there has been significant turnover; Jim Yano, Gwen Jordaan and Simon Moon are now gainfully employed. I am happy to report that Jim's thesis was recognized as the Outstanding Thesis from the College of Natural Sciences and Mathematics. Lauren Hartman has completed her research and is currently writing her thesis. Her results suggest that our favorite enzyme, butyrylcholinesterase (BuChE), plays a key role in regulating the expression of amyloid peptide. Inhibition of the enzyme with an aryl dialkyl phosphate results in an increased expression of peptide. The significance of these results is that many common environmental contaminants, e.g., phthalate esters and BPA, are BuChE inhibitors. We may have stumbled onto a mechanism that might account for the dramatic increase in Alzheimer's disease. Alex Lyzlov, a new graduate student in the lab, will be working with Dr. Nakayama's group evaluating bisphosphates as BuChE inhibitors. Dr. Nakayama and I continue to collaborate to develop BuChE inhibitors as potential therapeutics for Alzheimer's disease.

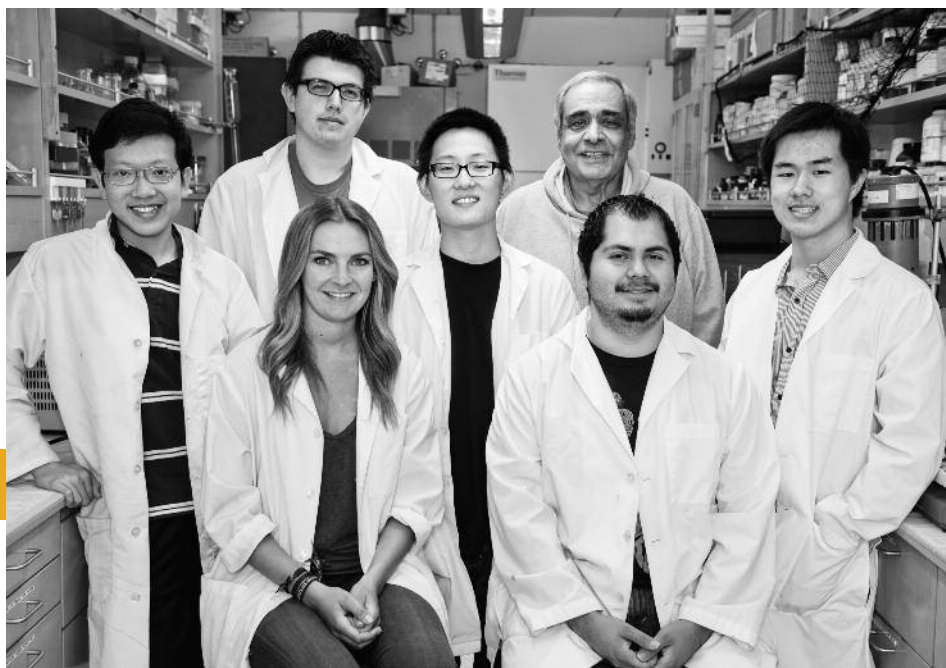
Archie Turner and George Lara have moved on to learning cell based assays, 2D PAGE and confocal microscopy. They will carry on Lauren's project. Archie will be using 2D PAGE to evaluate changes in protein expression as a result of inhibiting BuChE. George will enter the master's program in the fall and will be looking at the cellular location of BuChE during neuron development.

From left: Dr. Shahab Derakhshan, Dr. Xianhui Bu, Dr. Michael Schramm, Dr. Young Shon, Dr. Ken Nakayama, Dr. Tom Maricich, Dr. Lijuan Li, Dr. Stephen Mezyk, Dr. Krzysztof Slowinski, Elaine Bernal, Dr. Paul Weers, Dr. Vasanthy Narayanaswami and Dr. Christopher Brazier.

Two new undergraduate students, Herbert Mao and Aaron Ong, joined the lab this year. Both are working on the metallothionein (MT) project with the "old-timer" of the lab, "Sam" Nguyen. Sam has been instrumental in driving the MT project forward. He has been able to show conclusively that our technology is efficient at removing metal at PPT (parts per trillion) from seawater. Herbert and Aaron have been learning to express and purify our MT protein. We have been able to attract commercial interest in our patented technology. Several of us (former graduate students) are working to produce and commercialize a "heavy metal sponge" for water remediation under the guise of MGP Biotechnologies.

Josh Feng has become a "jack of all trades." He has been working with stem cells, evaluating the effect of phthalate esters on neuron development; working with Dr. Nakayama to synthesize a radiolabeled aryl dialkyl phosphate; and performing a variety of experiments I dream up during the day. He will be spending the summer at the University of Washington as a participant in the Amgen Summer Undergraduate Research Program. We will miss him.

I am pleased to report that we will be collaborating with Dr. Mezyk and Dr. Schramm. Dr. Mezyk will provide expertise relative to determining the metal binding affinity and capacity of the MT protein. We will be working with Dr. Schramm to determine the ability of his compounds to facilitate membrane transport. I'm looking forward to a very exciting upcoming summer and academic year.



Front row from left: Lauren Hartman and George Lara. Back row from left: Phuc Nguyen, Archie Turner, Joshua Feng, Dr. Roger Acey and Aaron Ong.

Dr. Paul Buonora

Student development activities took a large part of the stage in 2012-13. With the collaboration of Marco Lopez, Balwant Khatra and Eric Haas-Stapleton of the Biological Sciences Department and Chi-Ah Chun, I spent much of last summer developing a renewal of the NIH RISE grant that supports our students participating in research who intend to go to graduate school in the biomedical or behavior sciences. I was a co-PI on the previous grant, and with Marco returning to teaching and research, I will take over as the PI and program director. In addition to my RISE program activities, I continued my work with the CSULB NSF S-STEM student development program. The university has a long history of these types of diversity focused student development programs, and in the spring, a coalition of leaders from these externally funded programs came together to write a proposal to the NIH for a grant to develop a more comprehensive program of student development across the STEM disciplines. I am a co-PI on that BUILD grant proposal.

From within my own research group, Lizeth Perez, who was a RISE Fellow, was accepted to the UC Riverside chemistry Ph.D. program, where she will start work in fall 2013. Sean Donovan, who was in the S-STEM program, graduated in fall 2012 and is working in the analytical chemistry side of the chemical industry. Hannah Pham left the group in the fall and graduated in spring 2013. Her work as the leader of the department's American Chemical Society (ACS) student affiliate has been exceptional, and the group has earned leadership awards at the CSULB-wide level.

On the research front, Dr. Roger Lo, from the CSULB Chemical Engineering Department, and I are initiating moving some of our batch chemistry to continuous flow. Lizeth and a couple of the new students will begin this work during summer 2013. The summer will also mark a significant push on our phthalide chemistry work with a new graduate student.

Changing research directions is challenging, as new chemistries require new resources. Dr. Ken Ishida of the Orange County Water District continued his financial support of the research group, for which I am very grateful. I have also channeled some support, earned through collaboration with another CSULB alumnus, into the research group.

I ended a four-year run teaching the major's organic course this spring with a par-



Aldrin de Leon, left, spends time in the lab with Dr. Paul Buonora.

ticularly strong class. It was nice to end the run with a class scoring above the ACS exam average. I will return to teaching the graduate physical organic class in the fall and will coordinate the seminar program. As to the latter, I invite alumni interested in presenting their science in the seminar program to contact me.

Dr. Jeffrey Cohlberg

I have just completed my second year of the Faculty Early Retirement Program (FERP), teaching half time both semesters.

In the fall, I was one of three faculty who put together our brand new Graduate Core course in biochemistry (541), which is now taken by all entering students in the biochemistry M.S. program. We presented sections on proteins (Dr. Paul Weers), methods (me) and metabolic regulation (Dr. Vas Narayanaswami). It was a big, but enjoyable, job to put this new course material together, and I'll be teaching the class again this fall with Drs. Weers and Jason Schwans.

In the spring, I taught my graduate course in physical biochemistry (CHEM 544) for the first time since 2009. It's always a rewarding job to delve into the literature and to revise the lectures and handouts in an effort to make the course as up-to-date as possible. I also enjoyed teaching first semester biochemistry (441A) and the biochemistry lab (443), as well as serving as coordinator for the fall seminar program, organizing the visit of our annual Distinguished Visiting Lecturer and editing this newsletter.

My molecular modeling manual, "Studying Protein and Nucleic Acid Structure with Jmol," is now available as part of the online portal for both Nelson and Cox, *Lehninger Principles of Biochemistry*, and Berg, Tymoczko and Stryer, *Biochemistry*, both published by W. H. Freeman. I'm continuing to update the manual to keep up with changes in the Jmol software, changes in the Protein Database web portal and the new protein structures coming out in the literature.

Dr. Tom Maricich

I am continuing in my lab as a full-time emeritus faculty doing writing and research.

Five undergraduate students, Therese Santos, Arturo Mejia, Joseph Kaladjian, Ali Abou Zahr and Dianne Choi, have been working in my research group. Dianne and Ali graduated last December. Dianne received chemistry honors at commencement and has continued as a valuable research volunteer. Michael Fimbres is working on his M.S. research project. We are studying sulfonimide alkylation reactions, especially those with isopropyl as the alkylating group. In addition to the predominant O-alkylation of phenols, some electrophilic aromatic substitution has been observed. Our work has been submitted as a full paper to *Tetrahedron*.

This past April, I presented a seminar to the Department of Chemistry and Biochemistry at San Francisco State University entitled "SNAAP™, Sulfonimide Alkylating Agents for Acids, Alcohols and Phenols," on the work of five M.S. and 13 undergraduate students at CSULB.



Dr. Stephen Mezyk (far right) poses with a group of 2013 graduates from the Department of Chemistry and Biochemistry. From left: Anas Al-Qazzaz, Trevor Reutershan, Thomas Cullen, David Russell, Brittney Sjelin, Garrett McKay and Lauren Olson.

Faculty Reports

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My wife, Suzanne, and I spent three weeks in Australia/New Zealand this past spring with a University of Washington alumni tour group. We studied the marine biochemistry of the Coral Sea, the geochemistry of Ayers Rock, aboriginal art paint chemistry and the food chemistry of many delicious native dishes.

I have been in touch with a number of past students this year and would be happy to hear from others to know how you are doing. My e-mail address is tom.maricich@csulb.edu. You can reach me on my cell phone at 562-209-4306.

Dr. Stephen Mezyk

The frantic pace of life continued this year for the CSULB Mezyk RadKEM group as we continued to focus on finishing up older projects in our research mix of environmental water remediation, nuclear chemistry and chemical carcinogenesis research. Overall, it was a fun and productive year, with 15 more published/in-press papers and 23 conference presentations. Having our accelerator access at the University of Notre Dame severely limited due to a major upgrade turned out to be very positive for us. Even though some students struggled to get data to complete their projects, we also had more time to write papers and grants, as I got to spend more time at CSULB in my office.

There was a lot of change in the research group this year, with many students finishing and graduating. Two M.S. students, Thomas Cullen and Garrett McKay, completed their thesis work this spring, and we are expecting Anas Al-Qazzaz to be finished this summer. Thomas is

planning on teaching in the community college system, and Garrett has already landed a position in industry for a year until he applies for Ph.D. programs for 2014. Both had incredibly fruitful M.S. projects, and we wish them continued success in their future endeavors. Brittney Sjelin and Trevor Reutershan completed their undergraduate degrees but plan on coming back to CSULB to start their M.S. degrees this fall.

Continuing students are Lauren Olson, who is working with Dr. Michael Schramm on organic synthesis projects for further radical kinetic studies; DeeAnn Asamato, who is investigating the reactions of sulfate radicals with pharmaceuticals in wastewater; Maya Hey, who is studying the removal of animal feed chemicals from farm waste; new M.S. student Shauna Otto who along with two new undergraduates, Kathrin Zimmerman and Krista Godlasky, are quantifying the efficacy of using advanced wastewater treatments to completely remove antibiotic residues in water systems; and another M.S. student, Ariana Gilmore, who is measuring the specific efficiency of the use of hydroxyl radicals to destroy beta-lactam antibiotics in waterways. We now are utilizing a mixture of accelerators, rapid-mix spectrophotometers and bacterial cultures to perform this work, which makes for a busy laboratory.

My students' conference presentations were again one of our highlights this year with our presence at the American Chemical Society meetings in Philadelphia (August 2012) and New Orleans (April 2013). Thomas Cullen also presented at the Radiation Research Gordon Conference (July 2012), and Garrett McKay went to the 16th Meeting of the IHSS at Zhejiang University, China (September 2012).

With the RadKEM group's continued success, my teaching duties in 2012 were only in general chemistry (CHEM111B). I am now the full-time course coordinator and have introduced some extensive curriculum changes to CHEM111B, notably incorporating a self-paced learning system (ALEKS). This approach of using online, individual, remedial learning for students gave a marked improvement in the overall class pass rate! My CSULB service efforts were mainly concentrated on the Executive Council in our department.

Overall, it was another amazingly successful year. They just keep on getting better!

Dr. Kensaku Nakayama

Our ongoing work with Dr. Roger Acey's group on the cholinesterases has developed into additional collaborative work with the research groups of Drs. Michael Schramm (Chemistry and Biochemistry) and Kevin Sinchak (Biological Sciences) over the past year or so. Dr. Eric Sorin (Chemistry and Biochemistry) continues to assist us in unraveling how these enzymes are inhibited through his expertise in computational chemistry. Undergraduates in my group have continued to make strong contributions to our work. Silvia Cervantes and Tina Vo have synthesized several more bivalent inhibitors. We have now completed a small library of these compounds, and their inhibition studies have turned out to be extremely interesting. Tina received the department's inorganic chemistry award this academic year. Both students have been accepted into our M.S. program for the fall.

Meanwhile, the M.S. students continue to be the main drivers of individual projects by solving many technical problems along the way. Trina Tran completed her second year in our chemistry M.S. program. Kim Tu will be finishing her M.S. thesis this summer. She has been accepted to several Ph.D. programs, including UC Davis and University of Illinois, Urbana-Champaign, but she will be attending UCI in fall 2013. Jackson Zhu finished his first year in our M.S. program and is very active in the lab. Jackson came to us from UC Davis with substantial research experience, so he is in position to develop into a fine research chemist.

I have been involved in teaching the advanced organic laboratory course (CHEM 420) since fall 2007. Every semester, I try to incorporate reactions from the literature into the course curriculum to give students an opportunity to apply their sophomore organic knowledge to ponder more modern synthetic methods in the lecture and lab. I've also continued to teach the CHEM 322 series, the two-semester organic chemistry lecture sequence for bioscience majors.

The course has its own challenges, but I continue to enjoy applying Dr. Don Paulson's (retired, Cal State L.A.) active learning strategy.

Dr. Vas Narayanaswami

"Swwwoooooosshhhhh...." That was the sound of 2012-13 rushing by in our lab. It started nice and slow; we welcomed two new graduate students, Mark Lek and Kai-Han Tu, to our lab in fall 2012. They are probing the possibilities of making lipoprotein chimeras, hybrids and mutants. Granted, the projects sound like weird science fiction shenanigans, but they actually offer tremendous therapeutic and mechanistic potential.

Fall 2012 also saw the culmination of our work on the biochemical and biophysical characterization of rat apolipoprotein E (apoE) as a publication in *Archives of Biochemistry and Biophysics*. Team Rat, as they call themselves (undergrads Tuyen Tran, Carlos Gallo, Jessica Kyees and graduate student Sea Kim), brought this project to fruition.

We bid a fond farewell to Jessica Gozum in winter and welcomed Aaron Ly, Gabriel Nesbitt, Charina Fabilane and Daniel Rajan. These students bring a unique type of humor into the lab. Talk to them if you encounter them in the hallway; you'll see what I mean. During the winter break, I had a fantastic trip to catch up with family and friends in India and visited the Taj Mahal, while the students held the fort here. Graduate students Roy Hernandez and Sea Kim and undergrads Jessica Kyees, Patricia Nguyen and Tuyen Tran showcased their work at the 25th Annual CSU Biotechnology Symposium in Anaheim; Jessica Kyees won the 2013 Howell-CSUPERB Research Scholar Award to carry out proteomic analysis of modified apoE, while Roy Hernandez was one of the finalists for the Don Eden Graduate Student Award.

The spring 2013 semester flew by even faster. Jessica Kyees and Patricia Nguyen were selected for the NIH-sponsored 2013 CHORI Summer Research Program. They will be working on their research projects at CSULB. Graduate student Shweta Kothari was awarded the 2013 McAbee-Overstreet Award to probe the structural organization of lipid-associated apoE. Congratulations, gals!

Tuyen Tran continued his award-winning streak in spring 2013. The latest feather in his cap was being named the 2013 CSULB CNSM Outstanding Graduate. He also won the 2013 Thematic Best Poster under the theme of Lipids and Membranes at the American Society for Biochemistry and Molecular Biology Annual Meeting in Boston. Go TNT!



Graduate student Mark Lek works with Dr. Vas Narayanaswami analyzing data from his research on lipoproteins.

My trip to Florida to present our work on oxidative stress and apoE at the American Heart Association Arteriosclerosis Thrombosis Vascular Biology Conference went well despite the meeting being held in the heart of Disney World! I always come back recharged and energized from this meeting. The gators were great, too!

This spring, Sea Kim will be completing his M.S. thesis investigating the use of reconstituted HDL containing apoE as a "nanovehicle" to deliver bioflavonoids across the cell membrane. Roy Hernandez has been accepted into the CSULB California Institute for Regenerative Medicine stem cell training program; he is in the process of winding down and writing his M.S. thesis.

So, with all these activities and more behind us in spring, we now look forward to summer 2013. We officially kicked off summer with a celebration for our newly awarded NIH grant. My goal for this summer is to read 10 books, and I am challenging my lab students to read 10 books in total. I suspect the summer is going to be a "swwwoooooosshhhhh...." all over again.

Dr. Michael Schramm

Molecular recognition is the study of how and why molecules interact. At its essence lies the attraction of molecules at energy levels "weaker than covalent." Truly, this is a paradigm of host and guest, or host and visitor should the stay be short. Hydrogen bonding, metal coordination and the hydrophobic effect cover some of these possible forces, enticing one to another. In nature, we find countless crucial interactions predicated on noncovalent interactions such as

enzyme-substrate recognition, DNA-protein binding and ion-receptor transport. From a synthetic point of view, these principles have strongly influenced areas of research from drug design to materials science to molecular self-assembly. Our research uses molecular recognition as a design principle to develop new synthetic molecules that are compatible with and capable of regulating biological function.

Current efforts in the Schramm Lab utilize the principles of molecular recognition to solve chemical and biological problems of significance to human health. We have developed a strategy to prepare a 1,000-member small molecule library of alpha-helical peptidomimetics designed to target a spectrum of protein-protein interactions based on the alpha helix. Our targets for modulation include the p53-HDM2 and BAX-Bcl protein-protein recognition events that are a cornerstone of study for the development of new chemotherapeutics. Additionally, these compounds can be readily converted to BODIPY fluorophores. A new M.S. candidate, Sewwandi Ratnayake, has taken on this project. Cindy Pham, who worked on this project over several years, became lead author reporting on our initial work in *Synthesis*. Cindy graduated this year and will pursue Ph.D. work at UC Davis in the fall.

A second project utilizes molecular recognition as a tool to develop synthetic small molecule receptors that we hope will one day shuttle molecules of our choosing across biological membranes. Dr. Birendra Adhikari joined our group in August 2012 and applied his expertise in supramolecular recognition and metal extraction to this problem. We will be publishing a paper on

Faculty Reports

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our findings on the necessary criteria to transport guest-conjugate molecules under the action of supramolecular hosts very soon. Ayu Fujii continued her efforts developing a system to study this phenomenon using confocal microscopy and presented her work at an ACS undergraduate conference in Claremont, Calif. Additionally, in collaboration with Dr. Roger Acey and Dr. Richard Hooley (UCR), we published our first findings in *J. Am. Chem. Soc.* showing supramolecular mediated endocytosis of fluorophores in cells.

A third project involves the development of completely new classes of supramolecular hosts in an effort to develop larger containers to study molecular phenomena. Sahar Roshandel, a new M.S. candidate, has begun work along with Alex To.

A new approach to developing enantio-enriched polyol and polyol amines has been developed by Makan Kaviani (M.S. degree expected in spring 2014), and we have our first publication on this topic currently under review with *Tetrahedron Lett.*

Nicole Mangabat finished up her work on selective acetylcholine electrodes and graduated this year. Nicole will put her degree in chemical engineering immediately to work in industry.

And finally, I was promoted to associate professor, effective fall 2013.

Please visit us at <http://schrammlab.wordpress.com> for more news.

Dr. Young Shon

After teaching CHEM 420, the advanced organic chemistry lab, for the fourth time since spring 2011, I took a sabbatical leave from CSULB and was away from teaching and service duties in spring 2013. I stayed for two months in the Department of Chemistry at Yonsei University in South Korea during this leave and was able to get some valuable experiences and new research ideas. After returning from the short leave, I have started implementing a new project, "engineering nanoparticle-graphene hybrid materials for plasmonics and catalysis applications," to our research program. A graduate student, Hanqing Pan, and a new undergraduate research student, Johnston Nguyen, are currently working on this project.

Our research group published a total of four research papers in this past year. One book chapter is currently in press in the *Dekker Encyclopedia of Nanoscience and Nanotechnology*. An article was published in *ACS Catalysis*, a new ACS journal focusing on important developments in catalysis research.



Working in Dr. Weer's lab are (from left to right) Elise Van Fossen, Marvin Huynhle and Wendy Beck.

Former graduate student Elham Sadegh-moghaddam, who is currently pursuing a Ph.D. degree at the University of Hawaii, Manoa, was the main author of this publication. Another article was published in *Langmuir* and authored by outgoing graduate student Diego Gavia, who will be joining the Department of Chemistry at UCLA in July for his Ph.D. studies. We have also submitted two other manuscripts to *RSC Advances* (accepted) and *Advances in Nano Research*. These manuscripts were co-authored by former undergraduate research students Jordan Koeppen and Van Troung, respectively, along with Diego and Elham.

New undergraduate students May Maung and Chris Salazar are working on the chemical catalysis of various ligand-capped Pd nanoparticles, studying the effects of ligand structure on catalytic activity and selectivity. May will begin her graduate studies in fall 2013, here, at CSULB. Yoonah Kim and Harriet Do were involved in the synthesis of nanoparticle catalysts with different compositions such as silver and iridium. Mai Pham has continued working on the photocatalysis of nanoparticle-ZnO hybrid materials.

We have continued our NIH-funded multifunctional biomarker research by synthesizing various dendron-capped gold nanoparticles with different core sizes and performing cytotoxicity and cell permeability studies using these nanoparticles on model cell lines. Graduate student Suprit Deol and undergraduate students Nisala Weerasuriya and Becky Hsu are currently working on the project. This research was presented at the 25th Annual CSU Biotechnology Symposium and the 2012 Annual Biomedical Research Conference for Minority Students. Serena Low, who will also

be joining our graduate program in fall 2013, has been working on the synthesis and biological testing of monodispersed dendron-capped Au₂₅ nanoparticles (together with Diego Gavia) and Au nanorods.

Personally, I have received several awards from CSULB this past year, including the Distinguished Faculty Research, Scholarly and Creative Achievement Award; Research and Scholarly Activities Committee Award; and ORSP/AA Faculty Stipend Research Incentive Award. I have also been newly elected as an editorial board member for two journals, *Journal of Nanoparticles* and *Advances in Nano Research*, during this period.

Dr. Eric Sorin

The 2012-13 academic year was a busy one for the Sorin Lab, as I found myself teaching/co-teaching two new courses: our physical chemistry lab (373) and our chemical communications course (361), the latter of which I'm now teaching for the third time (summer session 2013). I was also involved in a number of service activities that I greatly enjoyed this year, including serving as faculty advisor to the Association of Pre-Dental Students, our new pre-dental club founded this year by biochemistry major Nam Bui.

A number of personnel changes have taken place in the Sorin Lab this year, including the departure of M.S. chemistry degree candidate Ben Pham, who is now composing his thesis with plans to defend this summer. High school student John "Simba" Austin, a lab member for the past two summers, is moving on to the

molecular and cellular biology undergraduate program at Harvard this fall, and Sorin Lab alumnus Felisha Eugenio (B.S., biological sciences) was recently accepted into the M.D. program at Drew/UCLA. Graduating chemical engineering major and University Honors Program member Kim Helm completed her undergraduate thesis and is now participating in the Teach for America program. As these and other students departed in recent months, a number of new students were joining our research group, including C.S. major David Gaskins; biochemistry majors Nicole Hanson, John Millar and Lynn Nguyen; and incoming chemistry major/transfer student Khue Nguyen from Fullerton College. All in all, the lab is currently bustling with new and veteran blood alike!

Continuing Sorin Lab veterans also had a very successful year, winning a number of academic and research awards, including physics major Amethyst Radcliffe, who became our lab's first MARC Scholar; biological sciences major Erik Carpio, who received this year's John and Elizabeth Leonard Scholarship; biochemistry major Emilio Robles, who received the Leslie K. Wynston Award in Biochemistry; and biochemistry major Khai Nguyen, who received the 2013 James L. Jensen Undergraduate Research Fellowship. The star of the lab this year was, without question, graduating biochemistry senior Phuc La, who received the Hypercube Award for Computational Chemistry, our departmental award in analytical chemistry, graduation with departmental honors, an AIC Undergraduate Biochemistry Award and the 2013 CNSM Rhodes Award. It's been a good year for students in the Sorin Lab.

Unfortunately, while my students and I were so busy this year, our research program ground to a near halt in recent months, with a few exceptions. Biochemistry senior Samantha Cao gave her first oral presentations at the regional ACS Meeting in Claremont and the WCBSURC in San Diego this April. I was fortunate to enjoy a fruitful collaboration with Dr. Vas Narayanaswami and her recent M.S. graduate, Gursharan Bains, both of whom were true pleasures to work with. As of the beginning of the summer 2013 term, members of the Sorin Lab are hard at work analyzing a number of data sets and generating new projects, with all of us looking forward to a successful and productive research period throughout the oncoming academic year.

Dr. Paul Weers

The research program in the Weers research laboratory investigates the antimicrobial properties and lipid binding interaction of apolipoproteins, proteins that play a critical role in the transport of lipids in the human body. Last year, three students graduated with a master's degree in biochemistry from our laboratory: Pankaj Dwivedi, Chris Adams and Angela Wu. We were pleased to learn that Duc Le, who graduated last year, will be attending the Creighton University School of Medicine.

Our research group was eight students strong, with graduate students Anna Smith, Wendy Beck, Eugenia Maravilla, John Lwin and Kan Cong; and undergraduate students Nnejiuwa Ibe, James Horn and Phillip Nery. Nnejiuwa was accepted into the MARC program and received the biochemistry award from our department, based on his outstanding performance in the biological chemistry lecture courses, CHEM 441A and B, and the biochemistry laboratory course, CHEM 443. Wendy Beck received departmental honors, was selected for the Graduate Dean's List and was also a finalist for the Don Eden

Award at the annual meeting of the CSU Program for Research and Education in Biotechnology (CSUPERB). Several of our research projects were presented at the CSUPERB meeting (Wendy Beck, Anna Smith and Nnejiuwa Ibe), CNSM Research Symposium (Wendy Beck), CNSM Faculty Research Symposium (Paul Weers), and at the American Heart Association meeting organized by the Council on Arteriosclerosis, Thrombosis and Vascular Biology (Paul Weers).

A long-term project to investigate the antimicrobial properties of human apolipoprotein A-I, well known for its antiatherogenic properties, was brought to completion. Originally initiated by former undergraduate student Arti Patel (now pursuing a Ph.D. degree at Tufts University), several students have made valuable contributions: Chris Adams, Wendy Beck and Ivan Biglang-awa. In addition, the Eric Haas-Stapleton laboratory (Biological Sciences at CSULB) contributed with their expertise on antimicrobial analysis. This study was recently published in *Biochimica et Biophysica Acta*, section "Biomembranes."



Front row from left: Dr. Eric Sorin, Amethyst Radcliffe, Phuc La, Jessica Obnave, Julie Trieu, David Gaskins, Erik Carpio and Khai Nguyen. Back row from left: Emilio Robles, Samantha Cao, Khue Nguyen, Lynn Nguyen, Nicole Hanson and Karen Tran.

2012-13 Research Publications for Department Faculty

Dr. Roger Acey

- Ghang, Y-J, M. Schramm, F. Zhang, R.A. Acey, D. Clement, E. Wilson, Y. Wang, Q. Cheng, and R. Hooley. 2013. Selective cavitand-mediated endocytosis of targeted imaging agents into live cells. *J. Am. Chem. Soc.* 135, 7090-7093.
- Acey, R.A., and R. Kanner. 2013. Thimerosal removal device. U.S. Patent Number 8,440,791.
- Acey, R.A., and R. Kanner. 2013. Thimerosal removal device. European Patent Number EP07718237.6.

Dr. Xianhui Bu

- Wang, L., T. Wu, X. Bu, X. Zhao, X.F. Zuo, and P. Feng. 2013. Co-assembly between the largest and the smallest metal chalcogenide supertetrahedral clusters, *Inorg. Chem.* 52, 2259-2261.
- Lin, H-Y, C-Y Chin, H-L Huang, W-Y Huang, M-J Sie, L-H Huang, Y-H Lee, C-H Lin, K-H Lii, X. Bu, and S-L Wang. 2013. Crystalline inorganic frameworks with 56-ring, 64-ring, and 72-ring channels. *Science* 339, 811-813.
- Kang, Y., F. Wang, J. Zhang, and X. Bu. 2012. Luminescent MTN-type cluster-organic framework with 2.6 nm cages. *J. Am. Chem. Soc.* 134, 17881-17884.
- Zhang, Q., S. Zheng, X. Bu, and P. Feng. 2012. Two-step synthesis of a novel Cd₁₇ sulfide cluster through ionic clusters. *Z. Anorg. Allg. Chem.* 638, 2470-2472 (special issue on chalcogenides).
- Wang, F., Y. Shu, X. Bu, and J. Zhang. 2012. Zeolitic boron imidazolate frameworks with four-connected octahedral metal centers. *Chem. Eur. J.* 18, 11876-11879.
- Zheng, S., C. Mao, T. Wu, S. Lee, P. Feng, and X. Bu. 2012. Generalized synthesis of zeolite-type metal-organic frameworks encapsulating immobilized transition metal clusters. *J. Am. Chem. Soc.* 134, 11936-11939.
- Zhai, Q., Q. Lin, T. Wu, L. Wang, S. Zheng, X. Bu, and P. Feng. 2012. High CO₂ and H₂ uptake in an anionic porous framework with amino-decorated polyhedral cages. *Chem. Mater.* 24, 2624-2626.
- Bu, F., Q. Lin, Q. Zhai, L. Wang, T. Wu, S. Zheng, X. Bu, and P. Feng. 2012. Two zeolite-type frameworks in one MOF with Zn₂₄@Zn₁₀₄ cube-in-sodalite architecture. *Angew. Chem. Int. Ed.* 51, 8538-8541.
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Dr. Shahab Derakhshan

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* Equal contribution



Shon Wins Scholarly Achievement Award

Dr. Young Shon, a professor of organic chemistry in the Department of Chemistry and Biochemistry, is this year's winner of the CSULB Distinguished Faculty Scholarly and Creative Achievement Award. The award is presented annually to recognize the outstanding research accomplishments of a single CSULB faculty member. Shon received his B.S. and M.S. degrees at Sogang University in Korea and his Ph.D. at the University of Houston. After five years as a professor at the University of Western Kentucky, he came to CSULB in 2006. Shon's research is in the area of the synthesis, characterization and application of nanomaterials. These have included nanoparticle-cored dendrimers, used as multi-purpose biomarkers; ligand-capped metal nanoparticles and their use as catalysts; and metal nanostructured films, which are used in plasmonic sensor arrays.



SAACS

Student Affiliates of the American Chemical Society

By Hannah Pham

The 2012-13 school year has been successful for our student chapter at The Beach! The major objectives of our chapter that we implemented this year were: (a) to establish the outreach program, SAACS Science Showcase, for underserved elementary and middle schools; (b) to collaborate with chemistry clubs at other schools and with other organizations at CSULB; (c) to increase the involvement of student members through an increase of activities; and (d) to increase American Chemical Society (ACS) membership among our members.

The SAACS Science Showcase program seeks to help foster and inspire a passion for chemistry, science and health in K-12 students; to provide teaching opportunities for our student members; as well as to expand our collaboration efforts with on-campus organizations and other chemistry clubs. We have received a great deal of positive feedback, and the schools we visited have already requested us to come back to do more demon-

strations next year. The schools we have visited so far include Madison Elementary, McPhearson Magnet School and George de la Torre Elementary. When we visited George de la Torre, we found out that none of the students or teachers had heard of Bill Nye: The Science Guy! We are going to try to find someone to donate Bill Nye videos, or we are going to buy them for the school with our fundraising money.

We do not yet have funding for our SAACS Science Showcase program. Next year, we want to target high school classes as well. In this regard, we have applied for grants and organized fundraising events. So far, we have successfully been approved for a \$200 grant from the College of Natural Sciences and Mathematics for this program. We also have applied for a Community Outreach Grant from ACS, and we are waiting to hear their final decision. Our fundraising event included selling laboratory coats, goggles and study guides. We also held our biannual Periodic Table and Amino Acid Cupcakes and Cookies Sale during National Chemistry Week, Earth Week and

goods purchase, we handed out chemistry moles, chemistry tattoos and a periodic table/amino acid chart. Our sales have greatly improved from last year! Finally, we get donations from our popular Coffee and Donut Hour, which is SAACS's longest running event and continues to grow larger every semester!

This year, our club reached out to another chemistry club off-campus and other on-campus organizations to collaborate on events. Mainly, we have been speaking to the Priory of Biology and Chemistry at East Los Angeles College about touring the CSULB campus so we can show them all the programs our science departments have to offer, including research programs, and recruiting them to our university. We have also been helping each other find field trip and outreach opportunities, and giving each other tips on how to improve our clubs. At CSULB, SAACS has been working with the Biology Student Association to organize field trips and events together, such as the O.C. Crime Lab, Bootlegger's Brewery and Science Fair Judging; the Association of Pre-Dental Students and Association of Pre-Pharmacy

Opposite page: SAACS members. Front row from left: Samantha Cao and Cindy Pham. Back row from left: James Horn, Tanna Helm, Hannah Pham, Donnella Cardwell and Chelsi Heiner-Melancon.

in school outreaches and beach clean-ups at Belmont Shore; and the Chemistry and Biochemistry Graduate Student Association for networking events. Our club and the Pre-Dental Club were able to visit Danville Materials, courtesy of CSULB alumni Chris Angeletakis and Greg Dorsman. We learned a lot about what goes on in dental chemistry. Graduate student Chris Walowski kindly gave us a tour of the Ohana Brewing Company, where he works, and let us sample some of their awesome beer!

We also held our Second Annual Resume Workshop, inviting all clubs to join us, with guest speakers Denise Lutz and Airika Corley from Kelly Scientific. Students and faculty volunteers gave us positive comments about the helpful resume presentation, mock interviews and great speakers. We would like to thank all those who helped us have a successful year!

In previous years, we were unable to retain any of our members after the end of each semester. We decided to change that this year by requiring annual membership dues, which came with a free, "Powered by citric acid cycle," 100 percent recycled club T-shirt, and also giving members priority for field trips. We also increased the number and variety of activities per semester so the members have a greater opportunity to be involved in more events like bowling and movie nights. Creating activities for students to have fun together, like our annual Halloween party filled with good food, board games and Wii's "Just Dance," gives them a chance to build a bond with the club and its members and feel like they belong.

Our final goal was to increase the number of ACS members within our club. Twelve dollars from each student's SAACS membership dues now go towards their ACS membership, which includes a subscription to the *Chemical and Engineering Newsletter*. The number of SAACS ACS members increased from 26 last year to 55 members by the end of this school year! This is a huge improvement, and we hope to keep increasing this number.

We decided to apply for awards offered by

CSULB for all of our achievements this year. Our historian created our first scrapbook to keep track of all the events through photos, and more photos can be added through the coming years. We submitted this with an essay for the awards.

We applied for an award from CSULB's Student Life and Development in three different categories: Excellence in Organizational Management, Outstanding Programming and Outstanding Campus Involvement. We won a certificate for the Silver Award for Excellence in Organizational Management! We applied for another award offered by CSULB's Associated Student, Inc. for Student Organization of the Year, and we won! This award was particularly competitive since we were up against applicants from organizations that ranged from religious, extracurricular and departmental to sororities and fraternities. We received a glass, engraved award and \$500 to go towards the club. We are especially proud of this award!

During this very active year, we were lucky to have Dr. Michael Schramm as our continuing advisor and Dr. Paul Buonora as the new advisor. We would also like to thank Joyce Kunishima, Ray Grace, Bertha Macias, Irma Sanchez and Xiao Wong for their awesome support in all of our events! Thank you to the entire faculty in the department as well for supporting our students and our club.

Congratulations are in order for this year's board members: President Hannah Pham, Vice President Tuyen Tran, Secretary Osman Shaheen, Treasurer Samantha Cao, Public Relations Representatives Cindy Pham and Brandon Graham, and Historian Esther Choe. We would like to welcome the new board for the school year 2013-14: President Donnella Cardwell, Vice President Brandon Graham, Secretary Tanna Helm, Treasurer James Horn, Public Relations Representative Jacqueline Dominguez and Historian Chelsi Heiner. We are also very excited about our new organic chemistry Batman comic sweatshirts!

M.S. Theses

Christopher P. Adams

"Acetylation of Apolipoprotein A-I and Its Effect on Lipopolysaccharide Binding"
Advisor: Dr. Paul Weers

Cheng Tsung Chou

"Synthesis and Characterization of Heterometallic Metal Organic Frameworks"
Advisor: Dr. Xianhui Bu

Pankaj Dwivedi

"Truncation Analysis of Apolipoprotein III: A Five Helix Bundle"
Advisor: Dr. Paul Weers

Gwen Jordaan

"Cloning of the Gene for Metallothionein from Artemia and Challenges with Cloning the Promoter"
Advisor: Dr. Roger Acey

Simon Moon

"Changes in Histone Glycosylation Throughout Artemia Development"
Advisor: Dr. Roger Acey

Andrew C. Parker

"Recombinant Human Serum Albumin Binding Studies Using Isothermal Titration Calorimetry"
Advisor: Dr. Brian McClain

Heather L. Rogers

"Gold Nanoparticles Linked with Collagen Mimetic Peptides"
Advisor: Dr. Kasha Slowinska

Elham Sadeghmoghaddam

"Synthesis of Alkanethiolate-Capped Palladium Nanoparticles Generated from Sodium S-dodecylthiosulfate for Isomerization of Allyl Alcohols"
Advisor: Dr. Young Shon

Aparna B. Shinde

"Helical Collagen Mimetic Peptides as Nanorod Drug Carriers"
Advisor: Dr. Kasha Slowinska

Astor J. Suriano

"Studies in the Synthesis of Organophosphorus Compounds as Inhibitors of Butyrylcholinesterase"
Advisor: Dr. Ken Nakayama

Mayumi Tamada

"Kinetics of Free-Radical Reactions with Monoterpenes in the Aqueous Phase Mimicking Atmospheric Aerosol Chemistry"
Advisor: Dr. Stephen Mezyk

Xinping Wu

"Insight in the Structure of Lipid-Bound *Locusta migratoria* Apolipoprotein III: A Proteolysis Study"
Advisor: Dr. Paul Weers

James N. Yano

"Cellular Localization of CKLF3 in Rat Macrophages"
Advisor: Dr. Roger Acey

Awards & Scholarships

Chemistry and Biochemistry Students 2013

Annual and Endowed Awards



Joseph Swabeck



Lauren M. Olson



Makan Kaviani-Joupari



Erik Carpio



Joshua Feng



Shweta Kothari



Phuong-Hieu Sophia Nguyen

James L. Jensen Research Fellowship

The James L. Jensen Undergraduate Research Fellowship is awarded in honor of Dr. James L. Jensen, dean of the College of Natural Sciences and Mathematics (1993–95), to a declared undergraduate major in CNSM for engaging in undergraduate research with a CNSM faculty member. As a young faculty member, Dr. Jensen was known for his excellence in teaching and mentoring students engaged in research. The 2013 award was presented to **Joseph Swabeck**, a third-year undergraduate chemistry major with a mathematics minor who has worked in Dr. Shahab Derakhshan's lab for the last two years and has also performed summer research in synthetic organic chemistry at USC, with plans to pursue a Ph.D. in synthetic chemistry.

Robert B. Henderson Award

Dr. Robert B. Henderson, a distinguished scientist and teacher of organic and general chemistry, was a founding member of the Department of Chemistry and Biochemistry and taught from 1955–82. He served as chair of Physical Sciences and associate dean of the college. This award is given to a student best exemplifying Henderson's scholarship and commitment to the profession of chemistry. Two \$1,000 awards were presented this year, one to **Lauren M. Olson**, a graduate chemistry student in Dr. Stephen Mezyk's lab, who is studying the radical based degradation of iodinated carboxylic acids and planning on obtaining a Ph.D. in organic synthesis; and one to **Makan Kaviani-Joupari**, a native of Iran and a graduate chemistry student who is working in Dr. Michael Schramm's lab, performing research on synthesis of polyols and polyol amines.

John & Elizabeth Leonard Scholarship

The John & Elizabeth Leonard Scholarship is awarded to a student who has been contributing to his or her own education costs through part- or full-time work. Dr. John Leonard is an alumnus with a B.S. in chemistry (1969) and an M.S. in biochemistry (1972), who gives back because his education at CSULB made it possible for him to get to where he is today—senior vice president for development at Vaccinex, Inc. This year's \$5,000 award was presented to **Erik Carpio**, a fourth-year undergraduate biology major who has worked in Dr. Eric Sorin's lab for the last two years evaluating diseases generated from collagen mutations and who plans to attend medical school.

Kenneth L. Marsi Scholarship

The Kenneth L. Marsi Scholarship was established by faculty, staff, family, friends and former students of Dr. Kenneth L. Marsi on the occasion of his retirement in 1996. Dr. Marsi was a distinguished scientist and teacher of organic chemistry, and served superbly as department chair for 21 years. He passed away in 2005. The \$2,500 scholarships are used to defray registration fees of outstanding junior and senior chemistry or biochemistry majors. This year's awards went to **Joshua Feng**, an undergraduate student majoring in biochemistry and philosophy and working in Dr. Roger Acey's lab, who hopes to study chemistry/biological chemistry in graduate school; and **Joseph Swabeck**, a third-year undergraduate chemistry major with a mathematics minor who has worked in Dr. Shahab Derakhshan's lab for the last two years and has also performed summer research in synthetic organic chemistry at USC, with plans to pursue a Ph.D. in synthetic chemistry.

McAbee-Overstreet Fellowship

The McAbee-Overstreet Fellowship recognizes a graduate student for excellence in scholarship and commitment to research. It was established by a donation from Cathie Overstreet, who received her M.S. degree in biochemistry at CSULB in 2004 under the supervision of Dr. Doug McAbee and went on to a Ph.D. in molecular biology at UC Irvine. This year, an award of \$2,000 was given to **Shweta Kothari**, a native of India and a graduate biochemistry student doing research in Dr. Vas Narayanawami's lab.

Michael Monahan Fellowship

The Monahan Award was established through a generous bequest from Dr. Michael Monahan, an alumus of our department who received his B.S. in chemistry in 1963 and his Ph.D. in physical organic chemistry in 1968 at UC San Diego. He was a distinguished scientist and member of the faculty at the Salk Institute and subsequently a senior research scientist at Beckman Instruments. Dr. Monahan was also the founder and president of California Medicinal Chemistry Corporation. In 1985–87, following his retirement, he served as a lecturer in the Department of Chemistry and Biochemistry. According to his will, the income from his bequest is to be used to support student research in the department. This year's award of \$3,000 was given to two undergraduate biochemistry students performing research in Dr. Shahab Derakhshan's lab: **Phuong-Hieu Sophia Nguyen** and **Malinda Tan**, who plans on attending pharmacy school.

College Awards

CNSM Outstanding Baccalaureate Graduate
Tuyen Tran

CNSM Outstanding Thesis Award in Chemistry & Biochemistry
James Yano

Graduate Deans List
Wendy Beck, Garrett McKay

Phi Beta Kappa Inductee
Joshua Feng

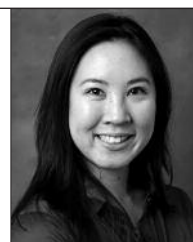
Robert D. Rhodes Award
Phuc Vinh La



Tuyen Tran



James Yano



Wendy Beck



Garrett McKay



Phuc Vinh La

Departmental Honors

Graduates: Wendy Beck, Thomas Cullen, Garrett McKay
Undergraduates: Dianne Choi, Phuc Vinh La, Tuyen Tran

Special Departmental Awards

American Institute of Chemists Baccalaureate Award
Biochemistry: Phuc Vinh La
Chemistry: Sung Hyun Ji

American Institute of Chemists Graduate Award
Biochemistry: Wendy Beck
Chemistry: Garrett McKay

Toni Horalek Award
Hannah Pham

Outstanding Teaching Associate Award
Thomas Cullen

David L. Scoggins Memorial Award
Nam Bui



Thomas Cullen



Diane Choi



Sung Hyun Ji



Hannah Pham



Nam Bui



Michael Varney

Subject Area Awards

American Chemical Society Polymer Chemistry Award
Michael Varney

Analytical Chemistry Award
Phuc Vinh La

Biochemistry Award
Nnejiuwa Ibe, Malinda Tan

Freshman Chemistry Award
Joshua Noel

Hypercube Award
Phuc Vinh La

Inorganic Chemistry Award
Dung Nguyen Phuong Vo

Organic Chemistry Award
Phuc Nguyen, Joshua Noel

Spyros Pathos IV 2nd Semester General Chemistry Award
Hailey Lauren Sharer



Nnejiuwa Ibe



Joshua Noel



Dung Nguyen Phuong Vo



Phuc Nguyen



Hailey Lauren Sharer

Awards & Scholarships

Chemistry and Biochemistry Students 2013



Malinda Tan



Hang Mac



Elise Van Fossen



Sewwandi R.
Karunachariyage



Emilio Robles

Continued from pg. 20

Glenn M. Nagel Research Fellowship

The Glenn M. Nagel Undergraduate Research Fellowship is awarded in honor of Dr. Glenn M. Nagel, dean of CNSM (1996-03). Dr. Nagel was an outstanding scientist and, during his time as a faculty of Cal State Fullerton, was honored as an Outstanding Professor who mentored large numbers of undergraduate and graduate students. At CSULB, he oversaw the development of the Molecular & Life Sciences Center and vigorously promoted undergraduate research. The \$1,000 Nagel Fellowship recognizes and supports an outstanding undergraduate student engaged in research during the summer or fall semester with a CNSM faculty member. The 2013 award was presented to undergraduate biochemistry student **Malinda Tan**, who plans on attending pharmacy school.

NHK Laboratories, Inc. Biochemistry & Organic Chemistry Award

NHK Laboratories is a family-owned, private label contract manufacturer of vitamins, minerals, herbs, nutritional supplements and over-the-counter pharmaceuticals. NHK operates two facilities in Santa Fe Springs as well as a subsidiary company, NHK Chemical Corporation. Along with the \$1,000 NHK scholarship, the recipient also has the opportunity to complete a course-credit internship at NHK's Santa Fe Springs laboratory. This year's recipient is **Hang Mac**, an undergraduate chemistry student who plans on applying to pharmacy school.

Louis M. Perlgut Scholarship

Dr. Louis M. Perlgut, professor of biochemistry in the department from 1965-82, taught the biochemistry courses for both science majors and nursing students, and supervised both graduate and undergraduate research. Dr. Perlgut served as the first graduate adviser for the M.S. program in biochemistry and was largely responsible for launching the program. Upon his death in 2003, his family established this scholarship to defray the tuition expenses of a graduate student in biochemistry. This year, a \$1,000 scholarship was presented to **Elise Van Fossen**, a graduate biochemistry student performing research on enzyme mechanisms in Dr. Jason Schwans's lab.

Maria Erlinda Co Sarno Scholarship in Chemistry

Sarno received her B.S. from the University of Santo Tomas, Philippines, and her M.S. in chemistry from the CSULB Department of Chemistry and Biochemistry in 1975, where she also earned the Outstanding Graduate Research Award. After a highly successful career as a chemist at Baxter Healthcare, she became a U.S. patent attorney serving small businesses and independent inventors. The award is meant to recognize and inspire an international graduate student with research interests in compounds leading to therapeutics or prevention of disease. This year, a \$2,500 scholarship was presented to **Sewwandi R. Karunachariyage**, a graduate chemistry student from Sri Lanka who works in Dr. Michael Schramm's lab.

John H. Stern Award in Physical Chemistry

The Stern Award, consisting of a cash prize, is given in memory of Dr. John H. Stern, internationally known for his work in solution thermodynamics and author of many publications in that field. The award was established by colleagues, former students and friends of Dr. Stern, who was a member of the faculty from 1957-87 and a distinguished teacher of physical and general chemistry. The 2013 recipient of the \$1,000 Stern Award is **Joseph Swabeck**, a third-year undergraduate chemistry major with a mathematics minor who has worked in Dr. Shahab Derakhshan's lab for the last two years and has also performed summer research in synthetic organic chemistry at USC, with plans to pursue a Ph.D. in synthetic chemistry.

Leslie K. Wynston Scholarship

Dr. Wynston was a biochemistry professor in the department from 1965-98. He served as chair of the Pre-Professions Health Advisory Committee for many years and was active in both the western and national Association of Advisors for the Health Professions. The \$1,500 award recognizes an outstanding junior who is pursuing a B.S. in biochemistry and planning to enter a health-related professional school the following year. This year's winner is **Emilio Robles**, an undergraduate biochemistry student doing research in Dr. Eric Sorin's lab who plans to attend medical school.

Contributions to Student Award Funds Are Welcome

The department welcomes contributions to support these awards. When you make your donation to the department, you may specify that it go to the Wynston, Stern, Marsi, Henderson, McAbee-Overstreet, Sarno or Monahan fund, or general scholarship fund. Les Wynston particularly welcomes donations that will enable him to increase the amount of the annual Leslie K. Wynston Scholarship and ultimately to endow it. Contributions to the department can be made at www.csulb.edu/givenow or returned in the enclosed envelope. Contributions to the Louis M. Perlgut Scholarship fund may be sent to Social Ventures, Inc., 124 Westfield Dr., Ithaca, NY 14850.

Department Hosts Third Annual Career Day

The Department of Chemistry and Biochemistry held its third annual Career Day event on Saturday, Oct. 13, 2012. The event featured eight speakers, including four CSULB alumni, who discussed career options in chemistry.

Alex Gharagozlov, director of operations at Phenomenex, Inc., a leading manufacturer of chromatography products, began by conducting a group discussion with the students about their career paths and the options available to them.

Dr. James DeOlden, co-founder of Mediatech, Inc. and the 2007 Distinguished Alumnus of the College of Natural Sciences and Mathematics (CNSM), spoke next. He described how his career led from working at Douglas Aircraft while a student at CSULB, through technical management positions at a number of pharmaceutical companies, and eventually leading to establishing his own company.

Maria Ramirez, coordinator of CNSM's Health Professions Advising Office (HPAO), described career paths in the health sciences and the services that the HPAO provides to students who are applying to professional schools.

Eri Hirumi, group manager of regulatory affairs at Beckmann Coulter and a CSULB alumna, told the students how her work as a development

chemist at Beckmann led to an interest in regulatory affairs, specifically worldwide labeling requirements for in vitro diagnostic products.

Cheryl Shimazu (1980, M.S., chemistry), professor of chemistry and former department chair at Cerritos College, described career opportunities in community college teaching.

Airika Corely, a contract scientific recruiter at Kelly Scientific Resources, gave a talk on job interviewing skills and other aspects of finding employment in scientific areas.

Dr. Ken Ishida (1983, B.S., microbiology), a research and development chemist at the Orange County Water District, spoke about his work on various projects related to water purification and jobs in general for chemists in the public sector.

Finally, Dr. Richard Hooley, professor of chemistry at UC Riverside, spoke about academic careers in chemistry and described the working life of a professor at a Ph.D. research institution.

Drs. Jeff Cohlberg, Paul Buonora and Kris Slowinski organized the event. We are very grateful to the speakers who generously donated their time for the benefit of our students.

Honor Roll of Donors (July 1, 2012 – June 28, 2013)

All of us in the Department of Chemistry and Biochemistry extend our heartfelt thanks and appreciation to the following alumni, friends, corporations and foundations that made gifts to the department from June 30, 2012 through June 28, 2013.

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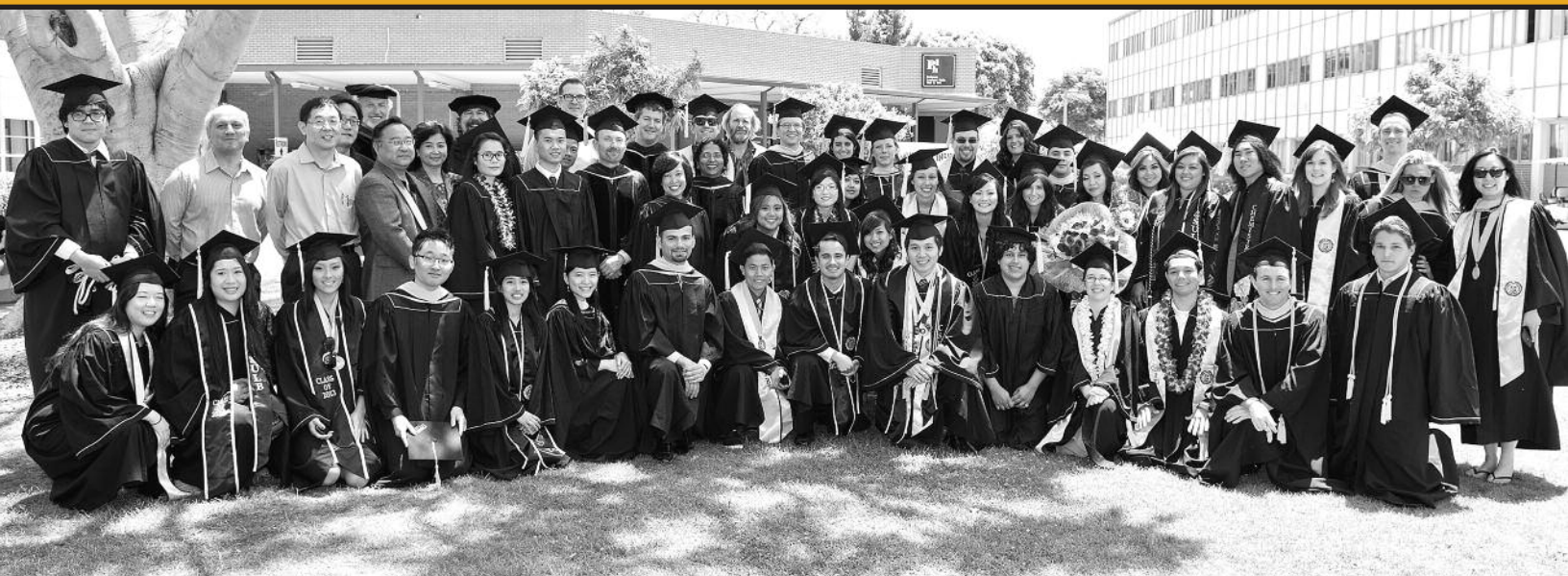
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