

NEWSLETTER

Greetings! Welcome to the 2007 edition of the department newsletter. This issue describes activities of students, faculty and alumni that took place over the last two years. We hope you enjoy it. Send us your suggestions for the 2008 edition.

Cliff Berkman, Chair, and Mary Luckey, Newsletter editor

CLIFF BERKMAN, DEPARTMENT CHAIR, 2005-2007

Visitors to the Chemistry and Biochemistry Department office on October 31, 2005, had no doubt there was a new Chair, as they saw not only the Feng-shuied Chair's office with its green walls and sleek furnishings, but the man behind the desk, who on that day wore a Superman suit that was a gift from his students. When Cliff Berkman was a candidate for department chair, he stressed his desire for a workplace to which people enjoyed coming. He has made good on that promise, greeting people with a ready smile, enthusiasm and interest, as well as a flask of tempting candy. He chats with those who have come for a conference in a pair of chairs across from his astonishingly uncluttered desk. On a typical day the office is a congenial place, bustling with students and staff.

Cliff's hospitality extended beyond the office, as he and his wife Noreen continued to throw their annual fall pizza bake in their backyard. This year their son, Evan, born in March 2006, added to the growing number of next generation partiers.

In March 2007 a faculty committee collected over one hundred comments from students, faculty and staff for a midterm review of Cliff's

performance. These comments praised his superb leadership in developing and directing academic programs, his dedication to advising students and resolving grievances, his successful representation of departmental needs to the administration, and his desire to create an environment that enables the faculty to be productive and satisfied with their job performance. In the numerical type of rating so familiar to students and faculty, two-thirds of respondents rated his overall performance as chair "1" for outstanding. Congratulations, Cliff, on a job well done!

In June Cliff announced his intention to move to Washington State University, where he will be a tenured professor of chemistry with many opportunities and advantages. We will miss him and we wish him success!

**BYE, SCOTT!**

With much celebration and sadness we said goodbye to Professor Scott Gronert at a holiday party on December 16, 2006, at the home of Uschi Simonis and Dieter Meyerhoff. The next day Scott, Heidi and their twins Bobby and Amelia headed east for Scott to become a professor of chemistry at Virginia Commonwealth University in Richmond, Virginia.

Scott arrived at SFSU in 1990 after completing his Ph.D. at U.C. Berkeley with Andrew Streitwieser, Jr., and a post-doc at the University of Colorado in Boulder with Charles DePuy. His accomplishments here were exceptional. Among his awards, he said the most meaningful was

continued on page 2

Bye! Scott continued from page 1

the Northern California Phi Beta Kappa Teaching Excellence Award. Students in his Organic Chemistry classes over the years gave him top marks and remarked on the clarity and ease with which he lectured.

Scott's research has focused on the use of mass spectrometry and computational chemistry to study reaction processes in organic and biochemical systems, including studies of organic reaction mechanisms in the gas phase and methods for sequencing and characterizing peptides. In his years at SFSU, Scott obtained eleven research grants from NSF, NIH, ACS-PRF and Research Corporation. Along with his students and collaborators, Scott published sixty papers while at SFSU; in addition he contributed

two book chapters. His students have pursued a wide variety of academic and industrial careers; for example, Adeliza Flores is at City College of San Francisco, Kristina Azizian is at Fisher Scientific, Ignacio Aliagas is at Genentech, Frank Chew is at Medtronic, Lil-Myra Fong is in the Peace Corps in Tanzania, Caroline Chu is at UC Davis, Kathy Li is at PolyPlus Battery in Berkeley, Renee Huang is at Agilent Technologies, and his post-doc, Wan Yong Feng is now at Chiron.

Colleagues highly valued Scott's input in faculty discussions and committees, and he played an important role in college development as well. As Cliff said at the December party, "Scott is a prolific scholar and outstanding teacher who will be missed as a mentor, teacher, colleague, collaborator, and friend."

ARAM KRAUSON, ALUM & KATRINA SURVIVOR

When Aram Krauson (B.S. Biochemistry, 2004) moved to New Orleans for the Ph.D. program at Tulane University, he did not anticipate the disruption caused by Hurricane Katrina. In fact, Aram lost almost all his belongings as he fled from New Orleans in a borrowed car. After a confused odyssey through the South (Mississippi, Alabama, and Tennessee), he headed to Oregon where Aram enrolled at the University of Oregon. Members of the Chemistry and Biochemistry Department collected \$400 to present to Aram when he visited SFSU. In spite of the extensive damage to buildings, including unimaginable loss of data and lab equipment, Tulane reopened the following year. Aram returned to New Orleans, where he has passed his prelims and settled into his research on pore-forming peptides in the lab of William Wimley.

NASA photo



CBSA, THE SFSU CHEMISTRY AND BIOCHEMISTRY STUDENT ASSOCIATION

The CBSA continues to be a vibrant organization that contributes greatly to the Department. With the goals of building community among students and faculty and enhancing the educational experience of our students through social activities, public outreach and development opportunities, the CBSA sponsors many activities throughout the year. For the last two years the CBSA officers have worked very hard to put on the department graduation ceremony at the end of the year (see story on page 6.)

The CBSA kicks off the year with its main fundraising activity, the sale of lab manuals, along with lab notebooks and safety glasses. During the summer CBSA members participate in Project SEED, a program of the American Chemical Society that places disadvantaged high school students in research labs. In 2006 CBSA gave these students an orientation and offered individual help on posters and practice in giving talks. In the spring CBSA conducts tours of the Department as part of Sneak Preview, a presentation to interested high school students who may choose to come to SFSU. Many CBSA members

participated in the ACS Family Science Night at Willard Middle School in Berkeley on October 26, 2006 (see photo at left).

This year the CBSA revived the popular CHEMBOWL, at which student and faculty teams enjoy friendly competitions at a Daly City Bowling Alley. In January 2006 the group enjoyed a ski trip to Tahoe. All these activities contribute to their stated goal: "We believe in creating a supportive environment where all student can have fun, excel academically and grow professionally." To further that support, their website, <http://userwww.sfsu.edu/~cbsa/>, provides practical tips for lab classes in addition to links for information about tutoring, careers, and other organizations of interest.



STUDENT HONORS

Numerous honors have been bestowed on Chemistry and Biochemistry students over the last two years.

The department is very proud of our recent Beckman fellows. Shahram Emami (B.S. Biochemistry and Physics, 2006) did research with George Gassner and is now working on his Ph.D. at the U.C. Davis Genome Center, where he has been awarded two fellowships, the Center for Biophotonics Science and Technology Quarter Fellowship and the Earl C. Anthony Fellowship.

Tim Acker (B.S. Biochemistry, 2007) did research with Teaster Baird and will attend Emory University for a Ph.D. in Biochemistry. And Kip Conner (B.S. Chemistry 2007), who did research with Uschi Simonis, is heading to the University of Washington in Seattle for a Ph.D. in Medicinal Chemistry.

Tim Acker also received COSE Distinguished Achievement Honors for 2007, as did Marlisa Pillsbury, who was also the Hood recipient at graduation 2006.

College scholarship winners include Russell Jensen who was awarded an ARCS Scholarship for 2006-07. Michel Lau (B.S. Chemistry, 2007) was awarded a Community Services Scholarship for 2005-06, and Shirin Usmani (B.S. Biochemistry and Molecular Biology, 2006) was awarded a Kenneth and Pamela Fong Scholarship for 2005-06 and a David Cassa Memorial Scholarship for 2006.

The following students received department awards: 2005-06

Florence Haimes Scholarship: Chi Ho
Edwin Motel Award: Michael Minton
Wee Tam Scholarship: Mark Anderson
Achievement Awards: Jared Thompson, Ani Temple, Jamie Moser, Jon Kiser, Russell Jensen, Chi Ho, Christle Guevarra
Summer Research Fellowships: Brian Blank, Georgi Diankov, Chi Ho, Chris Kehoe, Jasmin Kristianto, Mohsen Shamai, Ann Vo, Paul Brandt, Chris Cornell, Steven Ho, Nagmani Nallamothe, Michael Minton.

2006-07

Florence Haimes Scholarship: Judy Szeto
Henry Bertin Scholarship: Russell Jensen
Tiffany Hall Scholarship: Nhung (May) Pham
Edwin Motel Award: Candace Wong
Achievement Awards: Kwok-Leung (Steven) Ho, Judy Szeto, Brian Hamilton, Orit Gal, Timothy Acker
Summer Research Fellowships: Christopher Bernt, Mohsen Shamai, Judy Szeto, Brian Hamilton, Johnny Pham, Candace Wong

Tim Acker



Shirin Usmani (left) and Michel Lau





HOW AN OUTSTANDING TEACHER-SCHOLAR GOT INVOLVED IN PHOTODYNAMIC THERAPY

Dr. Uschi Simonis, Professor of Chemistry and a Henry Dreyfus Teacher-Scholar, has been recognized on campus for her teaching (2005 Excellent General Education Teaching Award) and her service (including 2002 Excellent Student Advising Award). She is regularly involved in teaching General Chemistry and Inorganic Chemistry and offers a highly desired graduate course on NMR applications and techniques. She has taught dozens of students in her research lab and mentored several research associates. She is very active professionally as a member of the Council of Undergraduate Research, the New York Academy of Sciences, the American Chemical Society, and other organizations. Perhaps most remarkable, however, is the new direction she has developed in her research.

Some years ago, students in the Simonis lab were busy with the synthesis of novel porphyrin derivatives and their characterization by NMR spectroscopy. In fact, Uschi seemed to have her hands full with these projects, plus acquiring new NMR instruments and running the NMR facility. Then the realization that similar compounds could be used in targeting led Uschi's group to study the interactions of porphyrin compounds with model membranes, and then with mitochondria. Her 2003-04 sabbatical in the laboratories of Prof. Joel Karliner and Gary Cecchini at UCSF and the San Francisco VA Medical Center secured her love of mitochondria and readied her for the challenge of developing new sensitizers for photodynamic therapies that may detect and/or treat cancers.

Photodynamic therapy (PDT) utilizes light-sensitive pigments (including porphyrins) that generate reactive oxygen species formed upon light activation of photosensitizers targeted to malignant cells. Formation of singlet oxygen, among other products, causes oxidative cell damage and death. In particular, when oxidative damage takes place in mitochondria it stimulates apoptosis (programmed cell death). Only a few drugs, such as Photofrin, are currently approved for PDT, and these lack the needed selectivity to be effective cancer drugs. However, the membrane potential and double membrane of mitochondria allow them to take up porphyrinic photosensitizers selectively. Dr. Simonis' lab is currently focused on the design and synthesis of porphyrins and related chlorins and phthalocyanines that localize to the mitochondria and the

comparison of activities of their different metal complexes.

Before Uschi was able to venture into the world of mitochondria, she collaborated with a colleague from Saint Mary's College in Moraga, Dr. Steven Backofer, to use NMR spectroscopy to determine how small organic counterions, such as ortho-substituted benzoates, localize in micelles. This work led her to study the interactions of porphyrins with ionic and nonionic micelles and vesicles as the simplest kind of model membrane systems. Although often critiqued for their limited value in the understanding of cellular processes, these studies were essential for Uschi's laboratory to comprehend how porphyrins have to be synthesized to penetrate membranes.

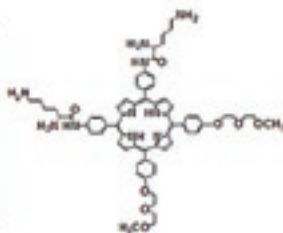
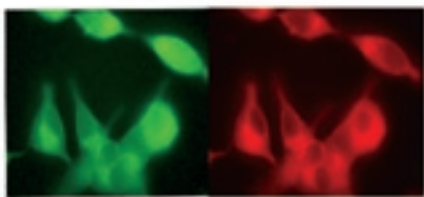
Among the compounds that preferentially localize in carcinoma cell mitochondria are charged mono- and di- para $N-(CH_3)_3^+$ -phenyl substituted tetraphenylporphyrins (TPPs). The position of the $N-(CH_3)_3^+$ substituents seems to strongly affect this targeting, with better results when the substituents are on adjacent phenyl rings. Both the metal and the charge also affect targeting of porphyrinic compounds, so

Uschi and her students have initiated a thorough study of how structural features like amphiphilicity, lipophilicity, ionic charge, and water-solubility are critical to mitochondrial uptake.

Based on this work, students in Uschi's laboratory have recently achieved results that enabled them to reach an exciting milestone. They synthesized a lysine-substituted

porphyrin that has high affinity for mitochondria of prostate cancer cells. They also prepared a fluorinated tetraphenylporphyrin that unexpectedly targets the plasma membrane of these cells. With these latest research findings, Uschi hopes to have finally developed an understanding how porphyrinic pigments have to be designed to selectively target mitochondria.

To support all this work, Professor Simonis has obtained extensive extramural funding from both NIH and NSF. Over her career she has published 47 papers and three book chapters. She and her students have presented over a hundred posters and talks. She has reviewed proposals for NSF and the ACS Petroleum Research Funds, served on the Beckman Scholars Advisory Panel, and reviewed many manuscripts for journals like the Journal of the American Chemical Society, Langmuir and Inorganic Chemistry. She has clearly made her mark as an outstanding teacher-scholar.



Fluorescence images of prostate cancer cells stained with the tetraphenylporphyrin alone (red fluorescence) and with a mitochondria specific stain (green fluorescence). The overlay image shows that the fluorescence of the porphyrin colocalizes with that of the mitochondria-specific stain indicating mitochondria targeting.



ALUMNI AND FRIENDS CAN HELP...

our undergraduate and graduate students become leaders in the chemistry and biochemistry communities.

Our funding priorities include:

- Scholarships and fellowships for graduate and undergraduate students
- Seminar series in Chemistry and Biochemistry
- Support for student research projects
- Department Study Lounge renovations

Here's how to donate to the Chemistry & Biochemistry Department:

ONLINE AT:

<http://www.sfsu.edu/~develop/GivingInfo.htm>

PHONE:

the Office of University Development at 415.338.1042

MAIL:

Office of University Development
1600 Holloway Avenue
San Francisco CA 94132.

(Make checks payable to the San Francisco State University Foundation.)

Be sure to say it is for the Chemistry and Biochemistry Department.

THANK YOU!



The Department

sincerely thanks alumni Dave and Lola (Cheung) Bjorkquist for their recent generous donation to the department. David and Lola met while pursuing their undergraduate degrees at SFSU. They took all their senior classes together and graduated Magna Cum Laude in 1970 with BS degrees in Chemistry. After graduating from SFSU, they both earned doctoral degrees from the University of Washington and began careers at Procter & Gamble in Cincinnati, OH. Now retired, they live in

the Pacific Northwest.

In appreciation for the education they received from SFSU and for the importance of that education in preparing them for their careers in science, David and Lola have created an endowed fund to support the education and professional development of future generations of undergraduate Chemistry and Biochemistry majors at SFSU. Their gift will be matched by Procter & Gamble.

► Watch for the forthcoming book, *Membrane Structural Biology* by Mary Luckey, from Cambridge University Press.



KEEP IN TOUCH!

Please send your news and especially any changes of address to cbalumni@sfsu.edu

OR visit lewis.sfsu.edu/alumni.htm to fill in our quick online questionnaire

NEWLY TENURED: ANDREW ICHIMURA

Physical chemist **Andrew Ichimura** was granted tenure and promoted to Associate Professor this year. In addition to teaching physical chemistry and instrumental analysis, Andrew is an important part of the department's materials chemistry focus group. His research concentrates on developing and characterizing zeolites that self-assemble into monolayers or multilayered materials and can be doped with alkali metals to form conductive thin films or specific reducing agents. Among his successes in extramural funding is a special achievement: this year Andrew was awarded a five-year CAREER award from N.S.F.

Last year tenure was awarded to **George Gassner** and **Ray Esquerra**, who were also promoted to Associate Professor. George teaches biochemistry lecture and laboratory courses in addition to a graduate course on enzymology. His research is focused on enzymes that employ transition metals and organic

cofactors in their reaction mechanisms. Two of these enzymes are involved in the breakdown of styrofoam and another metabolizes polychlorinated biphenyls, giving his projects environmental significance. Ray Esquerra has been teaching physical chemistry for biochemists at both the undergraduate and graduate levels. His research investigates the molecular basis of disease by employing time-resolved absorption spectroscopy for kinetic analysis of protein function. Ray and George, along with Nancy Gerber, have added to the curriculum a new laboratory course called Biophysical Chemical Laboratory (Chemistry 443).

Other promotions include **Nancy Gerber**, biochemistry, and **Jane DeWitt**, inorganic chemistry, who were both promoted to Professor this year, and organic chemist **Weiming Wu**, who was promoted to Professor last year.



Dr. Andrew Ichimura

In Memoriam: The Department continues to miss the dedication and tenacious intellect of Dr. Don Eden, Professor of Physical Chemistry who died of cancer on August 23, 2000.

COSE STUDENT PROJECT SHOWCASE

Many of our students participated in the COSE Project Showcase by presenting posters on their research. In May, 2006, there were 6 graduate student posters and 19 undergraduate posters from the students in the Chemistry and Biochemistry Department, out of 149 posters in all. Two third place awards went to our students: in the graduate life sciences division, the poster by Creobelle Guzman and David Elgart titled "Ligand Binding Interactions Modulating the Substrate Specificity of Diamine Oxidase" describing their work done with George Gassner. And in the undergraduate life sciences division, 3rd place went to Jared Thompson for his poster on work done with Sergio Aragon, "Can Hydrodynamics Predict the Diffusion Properties of Amino Acids?"

In May, 2007, out of 113 posters there were 5 graduate posters and 11 undergraduate posters by students from Chemistry and Biochemistry. The first place in graduate life sciences posters went to Lenin Parrales, whose poster titled "Synthesis of Novel Di-Substituted Tetrphenylporphyrins as Potential Agents for Photodynamic Therapy of Cancers" described work done with Meden Isaac and Uchi Simonis. In addition, Georgi Diankov won an Honorable Mention, for his poster, "Alkali-Metal Doped, Nanoscale Zeolite Films as Potential Optoelectronic Sensors" with Andrew Ichimura.

Among the 2007 undergraduate life sciences posters, Brian Blank won 2nd place with his poster on "Synthesis of a New Diagnostic Agent for Prostate Cancer" with Cliff Berkman, while 4th place went to Timothy Acker for "Investigating the Contribution of the S1' Pocket of Trypsin to Substrate Recognition" with Teaster Baird, Jr. Two student posters won Honorable Mention: one by Helen Lee and Mohamad Azimi, "A Novel Approach for the Independent Synthesis of 2[3H]oxazolinones" with Ihsan Erden, and one by Heath Kornblum, "Molecular Dynamics Simulation for the Laboratory" with Marc Andersen and Cliff Berkman.

Congratulations to all the students who participated and extra kudos to those winners!

ADVISORY BOARD

In Spring of 2006, the former Chair (Jim Orenberg) and the current Chair (Cliff Berkman) established the Advisory Board to the Department of Chemistry & Biochemistry. The mission of the Board is to develop partnerships with Bay Area Employers to prepare the workforce for the future. The formative meeting of the Board was in May 2006. Since then the Board has met in October 2006 and May 2007. One of the present goals of the Board is to design laboratory experiences in our curriculum to better position and prepare students for internship opportunities in industry or government labs in the summers after their sophomore or junior years. The membership of the Advisory board consists of the Chair of the department, rotating representative faculty members, a current student majoring in the Department, Alumni, industry, government, and academic representatives, and a career advisor. A current list of Members of the Advisory Boards follows.

Name	Affiliation
Blank, Brian	current B.S. Chemistry Major
Dimond, Laura	SFSU Career Center
Jacobs, Richard	FDA
Latimer, Lee	Elan Pharmaceuticals
Matz, Jennifer	Mayor's Office of Economic & Workforce Development
Partridge, Les	Codexis Inc.
Simon, Reyna	Telik Inc.
Smith, David	Roche Palo Alto
Stacks, Pam	Office of the Provost, SJSU
Skidmore, Ken	Genentech Inc.
Takeoka, Gary	Western Regional Research Center USDA
Vanderlaan, Martin	Genentech Inc.
Watson, John	Prof Emeritus, Dept of Biochemistry & Biophysics, UCSF School of Medicine
Wee, Jennifer	On Assignment Lab Support
Wecke, Myron	SFSU Development Office
Berkman, Cliff	SFSU, Chem & Biochem
Palmer, Pete	SFSU, Chem & Biochem
Simonis, Uschi	SFSU, Chem & Biochem
Gassner, George	SFSU, Chem & Biochem
Ichimura, Andrew	SFSU, Chem & Biochem

► You are always welcome to attend Department Seminars on Fridays, 12:10-1:10pm in Thornton Hall.

GRADUATION

For the past two years the Chemistry and Biochemistry Department has enjoyed graduation ceremonies organized by the Chemistry and Biochemistry Student Association. The 2006 Graduation took place on May 26 at



the Towers Conference Center on campus. CBSA officers welcomed a large crowd of friends and families. After formal procession of the faculty and the graduates, Dr. Cliff Berkman gave the welcoming speech and Dr. Jim Keeffe gave the commencement address. They were followed by speeches by the undergraduate honoree and COSE Hood recipient, Marlisa Pillsbury, and the graduate student distinguished achievement awardee, Vinita Marathe. Graduates received diplomas in small Ehrenmeyer flasks under an arch of gold and purple balloons. A lively reception followed the ceremony.

The Second Annual Chemistry and Biochemistry Department Graduation ceremony took place on May 25, 2007, at the Harding Park Golf Course near campus. Quickly established traditions from the previous year included the welcomes by CBSA and the

Chair and the presentation of diplomas in flasks. Dr. Mary Luckey gave the commencement address urging graduates to pursue their intellectual interests, embrace and enjoy the new tools in their fields, and contribute to society in meaningful ways.

The undergraduate honoree Tim Acker expressed his deep appreciation of the department in his speech, and Dr. Berkman gave clever and useful advice in his closing remarks. The graduates and their guests enjoyed champagne and hors d'oeuvres, as many cameras recorded the significant event.

6



Department of Chemistry & Biochemistry
San Francisco State University
1600 Holloway Avenue
San Francisco, CA 94132
www.chembiochem.sfsu.edu

Non-Profit
Organization
U.S. POSTAGE PAID
Permit No. 7741
San Francisco, CA