



Bonding Students to Chemistry & Biochemistry

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Event Announcements

By: Dagoberto B. Ramos

University Deadlines:

- 5/10: Last day of instruction
- 5/10: Deadline to drop with college dean's signature
- 5/13-5/17: Final Examinations
- 5/24: Last day of semester
- 5/24: Deadline to file Request for Medical withdrawal
- 5/24: Deadline to file request for Educational leave with \$10 missed deadline fee

CNSM Department:

- 3/1: CNSM 5th Annual Faculty Research Symposium
- 3/14 @ 6:30pm: Fellows Colloquium. Prashanth Jaikmur, Physics and Astronomy: Cosmic Yin-Yang: The Bright and Dark Sides of Our Universe (Chartroom)
- 3/23 9am-3pm: Math Day at the Beach (University Student Ballroom)

SAACS:

- 5/3 @ 9:30am: Last coffee and donut hour.
Location: MLSC Patio
- 5/28: Cleveland Elementary Outreach. Volunteers needed! Email csulbchemclub@gmail.com for more details

Seminar Series:

- 5/1: Lauren Benz, University of San Diego. "Adsorption and Reaction of Organosulfur Compounds on Titanium Dioxide." Host: Dr. Bu
All seminars take place in HSCI-100 from 4pm-5pm

SAS Center:

- 5/2 @ 4pm: Science Education credential information session (SAS Center)
- 5/3: Peer tutoring ends

Career Development Center:

- 5/1 @ 12pm: Resume Writing Techniques
- 5/2 @ 1pm: Interviewing Techniques



Faculty Spotlight: Dr. Jason Schwans

By: Brandon Graham Editors: Jacqueline Dominguez, Briana Nickol

The newest face to the CSULB Chemistry and Biochemistry Staff has settled in nicely here and is proving to be a great addition to the department. Dr. Jason Schwans joined the department in the fall 2012 semester. Dr. Schwans grew up in Sioux Falls, South Dakota, where most of his family still resides. While in Sioux Falls, he attended Augustana College and earned his Bachelor's degree in Chemistry and Music. From there he went on to receive both his Masters and PhD in Chemistry from the University of Chicago. While studying for his PhD he focused his research on RNA; specifically the structure and energetics that are involved in the formation of secondary and tertiary structures in nucleic acids. "I had a general interest in biology and chemistry in college and wanted to bring them together. Using synthetic chemistry to generate new nucleotide analogs and use them to study RNA structure was a great opportunity to investigate biological molecules with a chemical perspective." After he finished his PhD, he was able to land a National Institutes of Health (NIH) postdoctoral fellowship at Stanford University in the Department of Biochemistry. At Stanford, his postdoc was mainly focused on protein catalysis, which ultimately directed him to his current research avenue –using unnatural amino acids together with traditional biochemical approaches to address fundamental questions of enzyme catalysis. Finally after seven years at Stanford, Cal State Long Beach was lucky enough to entice him to our fine facilities and welcome him as the newest member of the Chemistry Faculty.

Dr. Schwans is a bio-organic professor; meaning that his goal as a researcher and a professor is to better bridge organic chemistry and biochemistry. His current research is focused on enzyme catalysis and specifically trying to understand how enzymes achieve their enormous rate enhancements and specificity. "Take a reaction started at the time of the dinosaurs: it may be only halfway done by now in the absence of an enzyme, but with enzymes that same reaction could be finished in seconds or even less", was the analogy he used to emphasize the importance that enzymes play in reaction rates. As he puts it, his research is really about bringing



together organic chemistry and biochemistry; to forge new connections, and to better understand how and why nature can use these principles to such an effective level. To tackle this problem his lab employs interdisciplinary techniques, such as site-directed mutagenesis, x-ray crystallography, and atomic-level mutagenesis via protein semi-synthesis. Further, his lab is not afraid to make the molecules they need either and do so as part of their atomic-level mutagenesis projects. Interested students are encouraged to either email him, stop by his office to talk, or to visit his lab's webpage at <http://schwanslabatcuslb.weebly.com/research.htm> to learn more about his research.

Dr. Schwans is no stranger to teaching, having taught students as an undergraduate, continued teaching during his time in graduate school, and also was a guest lecturer at Stanford. He is currently teaching Organic Chemistry (CHEM 322A) and a rotating colloquium in Biochemistry (CHEM 595A). Other than moving his collection of thousands of vinyl records, one of the other challenging parts of moving here to CSULB was setting up his course notes and making sure that there was



continuity within them. He encourages students to take advantage of the research experience offered at CSULB. Dr. Schwans goes on to say the amount, depth, and breadth of the research opportunities offered at CSULB is something that is not offered everywhere. When asked for advice for students in his classes he says that they should strive to remember their fundamentals, as this will help to break problems down into their most basic components.

Fun Facts:

- Played saxophone in the summer band in Sioux Falls for a summer job
- Likes to spend his time outdoors
- Collects vinyl records and owns a few thousand
- Double majored in Chemistry and Music
- Likes to listen to jazz and classical music

Selected Publications:

1. Hamm, M.L.; **Schwans, J.P.**; Piccirilli, J.A. "The hammerhead ribozyme catalyzes the deglycosylation of 2'-mercaptocytidine" *J. Am. Chem. Soc.* (2000) 122, 4223-4224.
2. **Schwans, J.P.**; Cortez, C.N.; Olvera, J.A.; Piccirilli, J.A. "2'-Mercaptonucleotide interference reveals regions of close packing within folded RNA molecules" *J. Am. Chem. Soc.* (2003) 125, 10012-10018.
3. Gordon, P.M.; Fong, R.; Deb, S.K.; Li, N.S.; **Schwans, J.P.**; Ye, J.D.; Piccirilli, J.A. "New strategies for exploring RNA's 2'-OH expose the importance of solvent during group II intron catalysis" *Chem. Biol.* (2004) 11, 237-246.
4. **Schwans, J.P.**; Li, N.S.; Piccirilli, J.A. "A packing density metric for exploring the interior of folded RNA molecules" *Angew. Chem. Intl. Ed.* (2004) 43, 3033-3037.
5. Das, R.; Kudaravalli, M.; Jonikas, M.; Laederach, A.; Fong, R.; **Schwans, J.P.**; Baker, D.; Piccirilli, J.A.; Altman, R.B.; Herschlag, D. "Structural inference of native and partially folded RNA by high-throughput contact mapping" *Proc. Natl. Acad. Sci. U.S.A.* (2008) 105, 4144-4149.
6. **Schwans, J.P.***; Kraut, D.A.*; Herschlag, D. "Determining the catalytic role of remote substrate binding interactions in ketosteroid isomerase" *Proc. Natl. Acad. Sci. U.S.A.* (2009) 106, 14271-14275.
7. Forconi, M.*; **Schwans, J.P.***; Porecha, R.; Sengupta, R.; Piccirilli, J.A.; Herschlag, D. "2'-Fluoro substituents can mimic native 2'-hydroxyls within structured RNA" *Chem. Biol.* (2011) 18, 949-954.
8. **Schwans, J.P.**; Sunden, F.; Gonzalez, A.; Tsai, Y.; Herschlag, D. "Evaluating the catalytic contribution from the oxyanion hole in ketosteroid isomerase" *J. Am. Chem. Soc.* (2011) 133, 20052-20055.
9. Fafarman, A.T.*; Sigala, P.A.*; **Schwans, J.P.**; Fenn, T.; Herschlag, D.; Boxer, S. "Quantitative, directional measurement of electric field heterogeneity in the active site of ketosteroid isomerase" *Proc. Natl. Acad. Sci. U.S.A.* (2012) 109, E299-308.
10. Ruben, E.A.*; **Schwans, J.P.***; Sonnett, M.; Natarajan, A.; Gonzalez, A.; Tsai, Y.; Herschlag, D. "Ground state destabilization from a positioned general base in the ketosteroid isomerase active site" *Biochemistry* (2013) 52, 1074-1081.



Scholarship Opportunities

By: Brandon Graham

Name: Thermo Scientific Pierce Scholarship Award **Prize:** \$10,000 or \$5,000

Description: Thermo Fisher Scientific is offering our future science scholars an opportunity to win \$10,000 in scholarship funding for the 2013-2014 Fall semester. This scholarship was created to help provide educational opportunities for the future generation of scientists. Graduate students or undergraduate students must be enrolled in an accredited college for the 2013-2014 Fall semester, and must maintain a minimum 3.0 GPA to qualify for this scholarship. A pre-selected committee will award two \$10,000 scholarships and four \$5,000 scholarships among the candidates.

Deadline: July 31, 2013

Website: <http://www.pierce-antibodies.com/PierceScholarship/>

Name: Collegiate Inventors Competition **Prize:** Top Prizes Vary

Description: Up to 15 finalists will win an all-expenses paid trip to Washington, D.C. in October to participate in a final round of judging and in the awards dinner and presentation. One grand prize winner or team will receive \$25,000. One undergraduate winner or team will receive \$10,000 and one graduate winner or team will receive a \$15,000 cash prize. Academic advisors of the winning entries will receive \$3,000 each. Entries are judged on the originality and inventiveness of the new idea, process, or technology. The entry must be complete, workable, and well-articulated. Entries are also judged on their potential value to society (socially, environmentally, and economically), and on the scope of use. The judges' decisions are final. Students must be enrolled (or have been enrolled) full-time in any college or university at least part of the 12-month period prior to the date the entry is submitted. In the case of a team (maximum of four students), at least one member of the team must meet the full-time eligibility criteria. The other team members must have been enrolled on a part-time basis (at a minimum) sometime during the 24-month period prior to the date the entry is submitted.

Deadline: June 14, 2013

Website: <http://www.invent.org/collegiate/enter.html#questions>

Career Explorer

By: Jacqueline Dominguez

Ever wonder what you can do with your professional science degree?

Biofuels/Biodiesel Technology and Product Development Managers

Tasks:

- Conduct research to breed or develop energy crops with improved biomass yield, environmental adaptability, and pest resistance, production efficiency, bioprocessing characteristics, or reduced environmental impacts.
- Oversee biodiesel/biofuels prototyping or development projects.
- Analyze data from biofuels studies, such as fluid dynamics, water treatments, or solvent extraction and recovery processes; conduct experiments on biomass or pretreatment technologies.
- Design and conduct chemical conversion processes, such as etherification, esterification, inter-esterification, trans-esterification, distillation, hydrogenation, oxidation or reduction of fats and oils, and vegetable oil refining.
- Develop methods to estimate the efficiency of biomass pretreatments.

Tools used:

- Dissolved oxygen meters, remote reading thermometers
- Mass spectrometers (gas chromatography), and Polymerase Chain Reaction (PCR)
- Analytical software: Agilent ChemStation; Fleet Asset Management and Optimization Solutions FAMOS PEPSE; GE Energy GateCycle

Education Level:

- Science, technology, or engineering bachelors, masters, or doctoral degree.

For more information about this career or others in this field log onto:

www.onetonline.org



The Fume Hood

By: Jacqueline Dominguez

"A place where your noxious thoughts can be carefully filtered and fed back to the public!"

Finals are around the corner, so we want to wish you all good luck on the behalf of The Beaker team. Also, we would like to congratulate all the department award winners this year (list is on the following page) and all of you who will be graduating this year. And last but not least, The Beaker Team would like to personally congratulate the creator of The Beaker, Ms. Cindy Pham! She will be graduating this semester. WE WILL MISS YOU VERY MUCH. Good luck with your endeavors.

See you all next semester!

Chem-ertainment

By: Briana Nikols

N V S U I Q G M E K A Y P H U
 W O N K B D B E B Q R G O N N
 M W I B I O S Y N T H E S I S
 X E E T A K B L S E G E T P S
 K N T B A K K I Q N L S T E D
 Q O O A E D M D U Z Y W E P I
 N B R C B E I C N L C X H T P
 Q O P G H O L X A U O F E I I
 Q G R C A E L T O N L U P D L
 Y T O T O N A I I K Y W E E A
 N I Z T N C I M S S S E A Z C
 B G I B F I A C N M I U C Z I
 N D M E M B R A N E S D M E D
 E H V E T O Y R A K U E N Q H
 E Z J C N O B R A C B O N D S

ACID
 AMINO
 BIOCHEMISTRY
 BIOSYNTHESIS
 BONDS
 CARBON
 CATALYST
 EUKARYOTE
 EXON
 GENE

GLYCOLYSIS
 INTRON
 LIPIDS
 MEMBRANE
 METABOLISM
 NUCLEOTIDE
 ORGANIC
 OXIDATION
 PEPTIDE
 PROTEINS

Chemistry for Today's World

By: Cindy Pham

"Your chemical connection to today's world"

Scientists are considering using stem cells to "patch up" blood vessels in the body. Diseases like diabetes and multiple sclerosis are caused by inflamed and leaky blood vessels. Treating these diseases using stem cells is a possible cure for these patients. Click on the article below to read more about it.

<http://cen.acs.org/articles/91/web/2013/04/Putting-Stem-Cells-Place.html>

Further stem cell news! FDA has approved for stem cell trials! Patients with spinal cord injuries will be tested beginning this summer! To read more about this exciting article click below!

<http://cen.acs.org/articles/87/i5/FDA-Clears-Stem-Cell-Clinical.html>

This Month in ChemHistory

By: Brandon Graham

"The only reason for time is so that everything doesn't happen at once." -Albert Einstein

May 2- [William Nicholson](#) placed wires connected to a battery in water, observing its [electrolysis](#), 1800.

May 12- First successful use of [streptomycin](#) on human beings, 1945.

May 16- [Theodore Harold Maiman](#) first produced [laser](#) light ([ruby laser](#)), 1960.

May 22- [Louis Pasteur](#) announced separation of [optical isomers](#) ([mechanical separation of asymmetric crystals](#)), 1848.

May 29- [General Electric](#) announced synthesis of gem-grade [diamonds](#), 1970.



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2013 Department Awards, Honors & Scholarships

Henderson Memorial Award

1. Makan Kaviani
2. Lauren Olson

Marsi Scholarship

1. Joshua Feng
2. Joseph Swabeck

Michael Monahan Fellowship

1. Sophia Nguyen
2. Malinda Tan

NHK Lab Inc. Award

Hang Mac

McAbee-Overstreet Scholarship

Shweta Kothari

Sarno Award

Sewwandi R. Karunachariyage

Wynston Award

Emilio Robles

AIC-Bac (Biochemistry) Award

Phuc Vinh La

AIC-Grad (Biochemistry) Award

Wendy Beck

AIC-Bac (Chemistry) Award

SungHyun Ji

AIC-Grad (Chemistry) Award

Garrett McKay

Analytical Chemistry Award

Phuc Vinh La

ACS-Polymer Award

Michael Varney

Biochemistry Award

1. Nnejiuwa Ibe
2. Malinda Tan

Freshman Chemistry

Joshua Noel

Honors (undergrads)

1. Dianne Elea Choi
2. Phuc Vinh La
3. Tuyen N. Tran

Honors (Graduate students)

1. Wendy Beck
2. Thomas Cullen
3. Garrett McKay

Horalek - service Award

Hannah Pham

Hypercube Award

Phuc Vinh La

Inorganic Chemistry Award

Dung Nguyen Phuong Vo

Organic Chemistry Award

1. Joshua Noel
2. Phuc H. B. Nguyen

Outstanding TA award

Thomas Cullen

Perlgut Award

Elise Van Fossen

Stern Award

Joseph Swabeck

Spyros Pathos Award

Hailey Lauren Sharer

Scoggins Award

Nam Giang Bui

CNSM Awards**2013 CSULB Outstanding Graduate Award**

Tuyen N. Tran

Glenn M. Nagel Undergraduate Research Fellowship

Malinda Tan

Robert D. Rhodes Award

Phuc Vinh La

James L. Jensen Undergraduate Research Fellowship

1. Joseph Swabeck
2. Khai Nguyen

CNSM Outstanding Thesis Award

James Yano

John & Elizabeth Leonard Graduate Scholarship

Erik Carpio