

Department of Chemistry Newsletter 2010

Message from the Chair

I hope this message finds you happy and well.

It has been a wonderful year for the chemistry department, highlighted by the hiring of our new colleague, Assistant Professor Tanya Schneider, whose teaching and research is in biochemistry. Tanya adds to our already strong department and there are details about her background and expertise below. We are absolutely thrilled to have her joining us.

I'm also pleased to report that chemistry at Connecticut College has been increasingly popular! The few years have brought an unprecedented surge in enrollments for general chemistry, and these students are now percolating into other courses. Pre-registration enrollments for organic chemistry, biochemistry, and physical chemistry are at record levels and we look forward to the extra excitement and energy that will come with having more science students and chemistry majors.

Another piece of excellent news is the recent announcement that New London Hall will undergo renovation and expansion starting in the summer of 2011. This project is long overdue and all of us in the sciences are extremely pleased that it is finally happening. This obviously gives a tremendous boost to the life sciences, but the new and renovated facilities will also have great benefit students in our interdisciplinary majors of *ACS Biochemistry* and *Biochemistry, Cellular and Molecular Biology*.

So read on and check out what's gone on in past year!

Best Regards,

Stanton Ching

Welcome Dr. Tanya Schneider!



Dr. Tanya Schneider joins our department as an Assistant Professor of Chemistry. Tanya's expertise is in biochemistry and organic chemistry, which are integrated in her research on biosynthesis of bacterial quorum sensing molecules. She will be teaching biochemistry lectures and labs this year.

Tanya received her B.A. in chemistry with honors from Williams College and her Ph.D. from Yale University with Alanna Schepartz. She was an American Cancer Society postdoctoral fellow at Harvard Medical School working with Christopher Walsh. She spent a few years in industry as a senior scientist with Envirologix in Portland, ME. She then felt the tug of her true calling and spent two years as a visiting professor at Smith College before joining the faculty at Connecticut College.

Timo Ovaska receives the Nancy Rash Award for Faculty Research

This spring, Timo Ovaska's outstanding research in organic synthesis and synthetic methodology was recognized with his being chosen to receive the 2010 Nancy Rash Award for faculty research. He joins Bruce Branchini and Marc Zimmer, who are past recipients of this award. Timo is shown with (from left to right) philosophy professor Simon Feldman who received the teaching award, biology professor Robert Askins who received the award for service to the College and President Leo Higdon.

Congratulations to Timo!



Other News

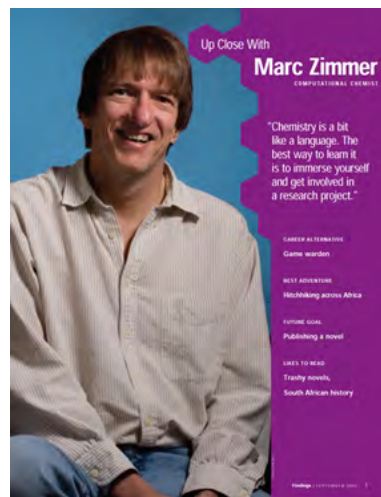
Bruce Branchini continues to serve as Councilor for the American Society for Photobiology and as a member of the Executive Council of the International Society for Bioluminescence and Chemiluminescence (ISBC).

Stanton Ching continues his service as secretary to the Editorial Board for Inorganic Syntheses, as well as his work with the Sherman Fairchild Foundation Scientific Equipment Program. He still serves as the College Faculty Athletics Representative to the NCAA. This past year was appointed to a 4-year term on the NCAA Division III Management Council.

Colleen Kaczmarek organized a two-day campus visit by Dr. Robert Musil, Scholar in Residence and Adjunct Professor in the School of International Studies at American University. He gave a campus-wide lecture, "*Hope for a Heated Planet: Can Students Stop Global Warming?*" and met with students in chemistry, biology, environmental studies, and the Goodwin-Niering Center for the Environment.

David Lewis was invited to deliver the Everett H. Pryde Lecture at Amherst College. This is an endowed lectureship that recognizes a distinguished Amherst alumna or alumnus whose career has been in science or a science-related field.

Marc Zimmer was featured scientist in *NIH Findings* (right), the NIH magazine distributed to more than 35,000 high school students. He was also advisor to the Bridgeport Aqua Culture Magnet School Biotech Challenge students who won the best project award at the Connecticut Student Innovations Expo.



Congratulations!
Class of 2010 Chemistry Majors

ACS Chemistry

Elizabeth Archer

Kyle Fast

Jacob Winegrad

ACS Biochemistry

Alicia Morgan

Alex Samma

Biochemistry, Cellular and Molecular Biology

Valerie Kim

Andrew Margenot

Bibi Zhelyazkova

Senior Honors Theses

| | |
|---------------------------|--|
| Alicia Morgan (Zimmer) | <i>Computational Redesign of Tetratricopeptide Repeat Domains with Increased Binding Affinity</i> |
| Alex Samma (Zimmer) | <i>Hula Hooping in the InfraRed Zone</i> |
| Jacob Winegrad (Ovaska) | <i>Synthesis of (+)-Fronodosin B via Microwave-Assisted Asymmetric Oxyanionic 5-exo dig Cyclization/ Claisen Rearrangement</i> |
| Bibi Zhelyazkova (Ovaska) | <i>Progress Towards the Total Synthesis of (\pm)-Fronodosin D</i> |

Independent Study

20 different students carried out independent study projects in 2009-10.

Chemistry Department Awards

| | |
|---|---------------------------------|
| <i>ACS-Connecticut Valley Section Award</i> | Elizabeth Archer |
| <i>Jean V. Johnston Prize</i> | Alicia Morgan |
| <i>Dr. Joseph Nunes Pereira Prize</i> | Samantha Brackett and Wayne Ong |
| <i>Paul Abel Swartz Memorial Prize</i> | Francis Martinson |
| <i>American Institutes of Chemists Award</i> | Alicia Morgan |
| <i>CRC Press Chemistry Achievement Awards</i> | Meghan Rossini and Ramza Shahid |
| <i>Department Organic Chemistry Award</i> | Taryn Campbell |
| <i>ACS-Analytical Chemistry Award</i> | Francis Martinson |
| <i>ACS-PolyEd Organic Chemistry Award</i> | Shuang Song |
| <i>Department Environmental Chemistry Award</i> | Chelsea Johnson |



Goldwater Scholarship awarded to Kelsey Taylor

Kelsey Taylor (Class of 2011 BCMB major) was awarded a 2010 Barry M. Goldwater Scholarship. Kelsey has been outstanding in the classroom while also carrying out research with Professor Branchini. She is also a standout member of the varsity cross country and track teams, as well as a build coordinator with the CC chapter of Habitat for Humanity.

Well Done and Congratulations Kelsey!

Erick Argueta receives ACS Research Award

Erick Argueta (Class of 2012 BCMB major) was awarded an American Chemical Society International Research Experience for Undergraduates award for Undergraduates, which he is using to conduct research at the University of Strathclyde in Glasgow, Scotland. Erick is part of the Science Leaders program at CC. He got his start in research working with Dave Lewis last summer.

Guid Job, Laddie!



Faculty Research and Grants

Bruce Branchini received a new grant from the NSF for \$583,000 for "Mechanistic Studies of the Firefly Luciferase Catalyzed Reactions." He was also awarded another new grant of \$225,00 from the Air Force Office of Scientific Research for "Development and Characterization of Novel Bioluminescent Systems."

Stanton Ching spearheaded a successful \$54,000 grant from the NSF-Major Research Instrumentation program for "Acquisition of Atomic Absorption Instrumentation for Multi-Disciplinary Undergraduate Research and Research Training." He is using the AA to support his research on synthesis, characterization, and catalytic studies involving nanostructured manganese oxides. Co-investigators on the grant were Steve Loomis, Page Owen, and Peter Siver from the life sciences departments and Joe Schroeder from the neuroscience program.

David Lewis continues his work on an ongoing NSF grant to study "Reaction Dynamics of Small Molecules." He also continues to a part-time appointment at Aerodyne Research Inc., which provides internship and job opportunities for CC chemistry students and graduates.

Timo Ovaska continues to enjoy support from the NIH for his research on "Novel Routes to Optically Active Frondosins and Liphagal."

Marc Zimmer was awarded a \$199,000 grant from the NIH toward "Understanding and Finding New Fluorescent Proteins." He also received 50,000 hours of Cray XT5 computing time from the National Institute for Computational Sciences. Marc also continues to coordinate a Science Leaders Program through NSF-s-STEM funding.

Publications (CC students in bold)

1. "Asymmetric Synthesis of Seven-Membered Carbocyclic Rings via a Sequential Oxyanionic 5-Exo-Dig Cyclization/Claisen Rearrangement Process. Total Synthesis of (-)-Fronodosin B," T. V. Ovaska, **J. A. Sullivan**, S. I. Ovaska, **J. B. Winegrad** and J. D. Fair *Organic Letters* **2009**, *11*, 2715-2718.
2. "Red-Emitting Luciferases for Bioluminescence Reporter and Imaging Applications," B. R. Branchini, D. M. Ablamsky, **A. L. Davis**, T. L. Southworth, B. Butler, F. Fan, A. P. Jathoul and M. A. Pule *Analytical Biochemistry* **2010**, *396*, 290-297.
3. "GFP: From Jellyfish to the Nobel Prize and Beyond," M. Zimmer *Chemical Society Reviews* **2009**, *38*, 2823-2832.
4. "Allylic Proton-Proton Coupling in Stereodefined Alkylidenecyclobutanes and Alkylidenecycloprenanes," T. V. Ovaska and W. F. Bailey *J. Mex. Chem. Soc.* **2009**, *53*, 139-142. Article dedicated to the memory of Ernest L. Eliel, a pioneer in the field of stereochemistry.
5. "In Vivo Bioluminescence Imaging for the Study of Intestinal Colonization by *Escherichia coli* in Mice," M.-L. Foucault, L. Thomas, S. Goussard, B. R. Branchini, and C. Grillot-Courvalin *Applied and Environmental Microbiology* **2010**, *76*, 264-274.
6. "Discovering Chemical Aromaticity Using Fragrant Plants," Tanya L. Schneider *Journal of Chemical Education* **2010**, *87*, 793-795.

Student Presentations

1. **Alex Samma**, **Wayne Ong**, **Samuel Alvarez**, and **Shawn Mulcahy** (Zimmer) "Proton Wires in GFP-like Proteins." Poster presented at the American Chemical Society Northeast Regional Meeting; Hartford, CT; October 10, 2009.
2. **Kelsey Taylor** and **Samantha Linder** (Branchini) "Development of Firefly Luciferase-RFP Fusion Proteins for BRET-FRET-based Protease Assays." Poster presented at the National Conference on Undergraduate Research (NCUR); Missoula, MT; April 15-17, 2010.
3. **David Kriz** and **Lauren Eichelberger** (Ching) "Manganese Oxide Hollow Nanosheres: Synthesis, Characterization, Reactivity, and Catalysis." Poster presented at

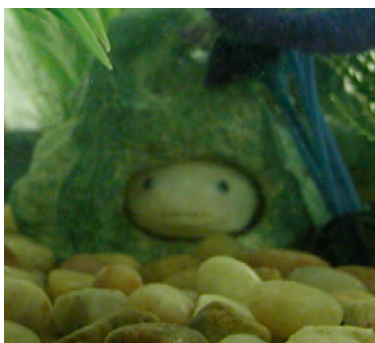
the American Chemical Society–Connecticut Valley Section Undergraduate Research Symposium; Amherst College; April 24, 2010.

4. **Alicia Morgan** (Zimmer and Lynne Regan of Yale) "Computational Redesign of Tetratricopeptide Repeat Domains to Increase Binding Affinity." Oral Presentation at the American Chemical Society–Connecticut Valley Section Undergraduate Research Symposium; Amherst College; April 24, 2010.

Other Happenings

Axolotls

GFP-modified axolotls are the most recent addition to Hale Laboratory. These salamander relatives are modified with green fluorescent protein (GFP), so they glow green under UV light. Visitors to Hale Lab can view this glowing spectacle. Heck, they're interesting to look at even without GFP glow!



Chemistry with a Hop, Skip, and Jump

Alex Samma (Class of 2010 ACS Biochemistry major) is a 3-time NCAA Division III All American in the triple jump. He was the indoor triple jump national champion as a junior in 2009.



ChemisTree and Chemist-Tees

Seniors **Elizabeth Archer** and **Alicia Morgan** organized an artsy-craftsy gathering for the department just before winter break. It was a time to relax and create-your-own chemistry-themed ornament for the department ChemisTree.



Liz and Alicia also finished the year by putting together chemistry department T-shirts, which list eight reasons why chemists make better lovers.



Lighting Up U-Haul

Bruce Branchini tried his hand at scientific art consulting this year. He helped a U-Haul graphics team design an educational/promotional display for the U-Haul trucks that feature fireflies.

(A luciferase photochemical reaction equation is in the night sky just above the firefly wing. It's barely visible here but easy to spot on the U-Haul trucks.)



2010 Summer Research



Clockwise from left: **Taryn Campbell '12**, **Sammi Brackett '11**, **Sarah Spiegel '11**, and **Wyatt Somogyi '11** carry out organic syntheses of molecules in the frondosin class of natural products.



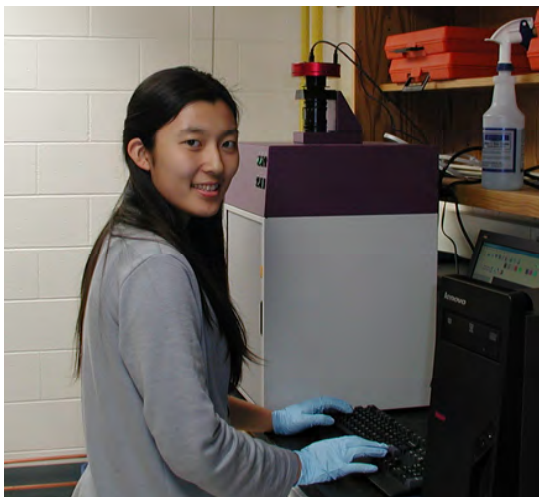
Above: **Ramza Shahid '13, Paola Peshkepija '13, Sam Alvarez '12, Ivan Leroux '13, Maritza Essis '12, and Binsen Li '13**, carry out computational analysis. **Shuang Song '12** (not in photograph) is also part of the Zimmer summer research group.

Below: Feeding time, as live fish are put into the axolotl tank. The group's other responsibility is to change the water to keep the axolotls healthy and happy.





Lauren Eichelberger '12 and **David Kriz '11** take a break from analyzing manganese oxide catalysts to pose in front of the new Varian Atomic Absorption spectrometer.



Jessica Yi '12 uses a chromatocan to image bioluminescent samples.

Alumni Updates

Susan Mabrey Gaud '68 was inducted into the Connecticut College Athletics Hall of Fame during Fall Weekend of 2009. She played basketball, field hockey, lacrosse, and tennis, and was also her senior class president. She is also the only chemistry major in the Hall of Fame. Gaud served as Kraft Foods' senior director of research from 1977-2007. She retired in 2007, but remains active on the Industrial Research Institute board of editors, North Shore Country Day School board of trustees, the Carthage College Natural Sciences advisory board, and Northwestern University's McCormick Engineering School Industrial advisory board.



David Perregaux '88 is a research scientist at Pfizer Global Research and Development in Groton, CT, where he has been for 20 years. He has worked on inflammation, immunology and diabetes programs developing, characterizing and optimizing biomarker assays for preclinical and clinical programs. Dave has also been helping the Connecticut College chemistry department for over 10 years as a part-time lab instructor, teaching evening lab sections for general chemistry and advanced general chemistry.

Sarah Bamford Tibbetts '90 has been teaching chemistry at Daniel Hand High School in Madison CT for approximately 10 years. She teaches sections of honors chemistry and enjoys teaching very much. She is also the parent of a high school student, Abby (15) and a third grader, John (8). During the summer, she enjoys going to Cape Cod with family, including Bella, a three-year old golden retriever who is the best swimmer in the family.



Heather Pinkett '97 is an Assistant Professor in the Department of Biochemistry, Molecular Biology and Cell Biology at Northwestern University. She is studying mechanisms underlying transport across cellular membranes and its regulation. In 2010 she was named a Pew Charitable Trust Scholar in the Biomedical Sciences.



Jamie Tuttle '99 recently completed his Ph.D. in organic chemistry from Cal Tech. He is a research chemist at Pfizer Global Research and Development in Groton, CT. This past spring, Jamie presented a chemistry department seminar here titled "Development of Enantioselective Organocatalytic Hydrogenation Methods and Progress Toward the Total Synthesis of (+)-Minfiensine."

Mike Marvel '03 completed his Ph.D. in inorganic chemistry from Northwestern University in 2008 and got married in 2009. He and his wife live in Chicago. In 2009, Mike joined the faculty of Aurora University as an Assistant Professor of Chemistry.

Audrey Davis '09 spent the year after her graduation as a staff scientist in Dr. Branchini's lab. This coming year she is headed off to Japan to take part in a program called Japan Exchange and Teaching (JET). She will be an assistant language teacher, bouncing between 5 elementary schools and 2 junior high schools while living in Aomori prefecture, which is known for its mountains, hot springs, and giant apples. Audrey plans to apply to graduate school when she returns to the states.



We Want to Hear from You!

We solicit updates from alums for this section, but we would love to get unsolicited alumni news as well. So please let us know what you've been up to! Send your updates to Stanton Ching: sschi@conncoll.edu.