

Department Highlights

- The CSB/SJU Chemistry Department is now on Facebook.
- Campus Scholarship & Creativity Day is April 22nd. Presentations begin at 8:00 am.
- The CSB/SJU Chemistry Department has been holding a research symposium like CSC Day for over 25 years.

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CSB Alumna Awarded Honor

Former Clare Booth Luce Scholar Makes Strides in Genetics at U of MN, Harvard



Anna Selmecki, Ph.D., CSB graduate in biochemistry.

Anna Selmecki '02 has been named "Outstanding Young Investigator 2008" by the journal *Eukaryotic Cell*.

Anna has just finished up Ph.D. studies in the Department of Biochemistry, Molecular Biology and Biophysics at the University of Minnesota. She was part of a cohort of graduates who entered that department together after finishing their bachelor's degrees in chemistry or biochemistry at CSB/SJU; the others include **Jennifer Klein '02** and **Bryan Johnson '02**.

Anna credits her success to more than a little bit of luck, although she will also acknowledge working very hard. She cites a Claire Booth Luce Scholarship for women in science as an early motivating factor that led her on her current career path. The Clare Booth Luce Program supports women in math and physical sciences; CSB was

an institutional awardee in 2000-2002. In addition, Anna says, conversations with an organic chemistry faculty member helped to solidify her confidence and resolve to go into research.

Anna's graduate work has resulted in a number of publications, including a highly prestigious *Science* article. Her research has centered on yeast genetics. In one study, she helped to show that the resistance of pathogenic yeasts such as *Candida albicans* to drug treatment may be related to aneuploidy, in which an unusual number of chromosomes appears in the cell. Cells with one extra copy of a chromosome (a situation called *trisomy*) are more likely to be resistant to (continued page 4)

ACS Mandates Curricular Change

The chemistry department is in the process of redesigning its undergraduate curriculum. The department has been reviewing alternative ideas for updating the program of instruction. This task is in keeping with new professional training guidelines set forth by the American Chemical Society. The new ACS requirements allow for greater creativity and flexibility in

delivering chemistry degrees.

At CSB/SJU, a striking feature of the proposed new curriculum is the integration of topics that transcend traditional disciplinary boundaries. For example, a proposed entry-level course in Structural Chemistry employs examples from organic, biological and inorganic chemistry, and subsequent courses in Reactivity will also span these three sub-

disciplines. Laboratory instruction may be offered in separate courses, each with task-oriented themes such as Measurement, Purification and Synthesis. At this point, these proposed changes are subject to ongoing revision. However, the department will be offering a new version of Chem 123 beginning in the fall of 2009, with a focus on the structure of molecules.

McKenna, McIntee on Sabbatical for 2008-2009 Year



Dr. Ed McIntee

“We have preliminary evidence that there is a receptor in the lung that causes accumulation of (S)-NNAL in the lung, and therefore causes the organ selectivity of NNK”
-McIntee

Associate Professors **Anna McKenna** and **Ed McIntee** are enjoying scholarly pursuits off-campus this academic year while on sabbatical.

An academic sabbatical is a sustained period of time, typically one- or two- semesters in length, when faculty members are freed from departmental and collegiate responsibilities to concentrate on research or other projects that revitalize them academically. Faculty members at CSB/SJU are eligible to apply for sabbaticals every seven years.

Anna McKenna is developing an online tutorial system for use in general chemistry courses during academic year 2009-2010. Some students in General Chemistry II are piloting select tutorials this semester. The tutorials, which are accessed through the Moodle interface, assist students in developing fundamental skills for understanding specific topics in chemistry. Brief sections of explanatory text pertaining to a topic are interspersed with questions. Students obtain immediate feedback indicat-

ing whether their responses are correct.

Students may also use tutorials to prepare for class or to review the fundamentals of a topic before beginning assigned, graded homework.

A benefit of the tutorial system Anna is developing is that both text and questions can be tailored to address any variant of topics taught in the general chemistry courses at CSB/SJU.

The site of Ed McIntee's sabbatical is the University of Minnesota Masonic Cancer Center.

It is well documented that cigarette smoking is an identifiable cause of several cancers, notably lung cancer. A class of compounds called tobacco-specific nitrosamines are linked to cancer induction, especially in the lung. The research group with whom Ed is working is studying two compounds, NNK [4-(methylnitrosamino)-1-(3-pyridyl)-1-butanone] and its metabolite, NNAL [4-methylnitrosamino)-1-(3-pyridyl)-1-butanol]. NNK is generated from nicotine during the curing of tobacco. In the body, NNK is metabo-

lized to NNAL, a carcinogen with a stereocenter. While the (R)-isomer of NNAL undergoes reactions that ultimately lead to its urinary excretion, the (S)-isomer is preferentially retained in lung tissue. In an update on his work, Ed writes, “We have preliminary evidence that there is a receptor in the lung that causes accumulation of (S)-NNAL in the lung, and therefore causes the organ selectivity of NNK.” A good deal of Ed's time is spent devising and doing experiments to determine the identity of this lung receptor.

Both faculty members will be returning to their normal teaching responsibilities in the fall of 2009.



Dr. Anna McKenna

Program Review in Review

During the 2007-2008 academic year, the chemistry department reaffirmed its commitment to providing excellent undergraduate training in chemistry as it went through the process of program review. This effort, coordinated by **Chris P. Schaller** and **T. Nicholas Jones**, involved chemistry faculty, students, alumni,

external reviewers and representatives from cognate programs such as nutrition, biology and environmental studies.

The department was able to document positive attributes such as strong student performance, a faculty dedicated to undergraduate education, an impressive record of assessment and strong

academic reputation.

This process also yielded areas that will require attention in order to keep the program moving forward. Key areas for future work are curricular reform (mandated by new ACS recommendations), addressing an uneven gender ratio among majors and increasing research productivity.

Alums Give Chemistry Seminars

Roles of Industry, Medicine, Natural Products Highlighted

Several alumni have presented seminars on their work to CSB/SJU chemistry classes during the 2008-2009 academic year. These presentations included a talk in October by **Gary Kordosky '64** as well as two seminars in March by **Thu Nguyen '03** and **Dorian Nelson '01**.

Gary, a scientist with the mining company, Cognis Corporation, presented an overview of the process used to obtain molybdenum from ores. The material drew on a variety of chemistry topics, including coordination chemistry, solvent extractions and electrochemistry. Gary's talk was part of a seminar series that was coordinated with **Mike Ross'** Analytical Chemistry class

with the intent to heighten students' awareness of the role of chemistry in industrial and environmental settings. Other speakers included a team led by Cyndi Hogerton of 3M, who outlined the various roles that chemistry plays in drug development, and Alena Kubatova of North Dakota State University, who discussed the role of aerosols in climate change.

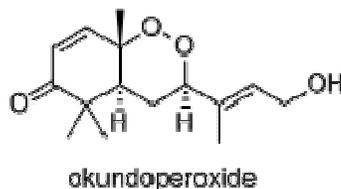
Thu Nguyen is a graduate student in the laboratory of Jetze Tepe in the chemistry department at Michigan State University. Tepe's lab is engaged in a variety of efforts related to the chemistry of disease, including synthesis, proteomics and elucidating the mechanism of action of anti-tumor agents. Thu's work focuses on the development of agents that can help combat damage of healthy cells due to radiation treatment, an important component of therapy for cancer patients. In addition to her work at Michigan State, Thu has previous experience as a researcher with the Cancer Institute of the University of Minnesota. She is planning to pursue an academic

career, possibly at a small school like CSB/SJU.

Interest in the science of disease runs in Nguyen's family: her sister, **Huong Nguyen '00** holds a Ph.D. in Public Health from the University of Washington and works at the Centers for Disease Control in Atlanta.

Dorian Nelson is just completing Ph.D. work in the laboratory of Thomas Hoyer in the chemistry department at the University of Minnesota. The Hoyer lab is engaged in the development of new synthetic methodology and the total synthesis of interesting natural products.

Dorian's seminar involved the laboratory synthesis of intermediates that have been postulated to occur in the biosynthetic pathway of okundoperoxide, an unusual peroxide-containing natural product. Before starting graduate school, Dorian worked for a few years at Merck Company in Rahway, N.J. He hopes to return to work in industry.



Thu Nguyen

Nguyen: "I didn't realize how good the chemistry program was here until I got to Michigan State."

Young Chemists Reach Out to School Kids

A group of CSB/SJU chemistry and biochemistry majors recently provided hands-on chemistry activities at Science Night at Discovery Elementary School in Waite Park. **Hadley McIntosh '10**, **Amy Hogerton '10**, **Nicole Gagnon '10**, **Lindsey Firman '11**, **Hang Zhang '11**, **Mardi Billman '11**, **Rachel Seurer '11**, **Nate Louwagie '11**, **Abdinasir Abukar '11** and **Charles Swanson '11**.

Students put together recipes and materials for making recycled paper, silly putty and bouncy balls, mostly using household items. The activities were held on the evening of February 19th in conjunction with other science activities, such as a spider exhibit and a live snake demonstration.

The chemistry activities proved to be very popular, with an estimated 20-30 children plus parents

in the room at any time during the two hour event. Chemistry activities concluded with the preparation of liquid nitrogen ice cream (vanilla chocolate chip).



Nicole Gagnon & Amy Hogerton making ice cream.



Faculty Receive Research Time

Selmecki (from page 1)

drugs of the azole class, which are widely used to treat *C. albicans* infections.

For her next venture, Anna has accepted a post-doctoral research position at Harvard Medical School's Dana Carver Cancer Institute. Although she misses family and friends in Minnesota, she really enjoys Boston. She hopes to return to the mid-west to pursue an academic research career.

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Ross, Jones to Pursue Scholarly Work

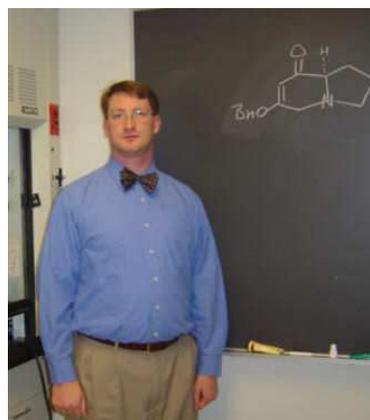
Chemistry faculty members **Mike Ross** and **Nicholas Jones** have each been awarded release time for research during the spring, 2010 semester. This release represents a sixth of a normal teaching workload for an academic year and is equivalent to one regular lecture course or two laboratory sections.

Ross, an Associate Professor and former chair of the department, plans to use the extra time in his schedule to help transition back from a sabbatical in the fall 2009 semester. He has been a leading mentor of research students in the department for a number of years; recent students include **Rich Lahr '08** and **Andrew Baltes '08**. His work has focused on the applications of analytical chemistry to environmental issues.

Jones holds the rank of Assistant Professor and is not yet tenured. He hopes to use the release time to finish up some work he has been doing with undergraduates here, including **Krista (Sacry) Mattson '07**, **Keely (Sacry) Hoban '07** and **Zeljko Ostojic '08**. A recent graduate of Montana State University, Jones recently had a paper accepted for publication in *Synlett*.



Dr. Mike Ross and students in the chromatography lab



Dr. T. Nicholas Jones

His work deals with organic methodology, or the development of new reactions for use in organic synthesis.

Alum Notes

Kimberly Switlick Prose '99 was profiled in the fall 2008 issue of Saint Benedict's Magazine. Kimberly has a graduate degree in Public Health Policy from George Washington University and is employed by BearingPoint Inc., a contractor for the U.S. Agency for International Development.

Kimberly now travels to all points on the globe working to improve health care access in some of the world's poorest locations.

This current position is the result of a trajectory that started soon

Short Reports From Past Graduates

after leaving CSB/SJU. After graduating with a degree in chemistry, Kimberly did volunteer work in the West Bank, an experience that brought her new perspective and a desire to alleviate the problems she witnessed in that experience.

Annalisa Jordan '04 is finishing up her Ph.D. in organic chemistry at the University of Iowa. She has accepted a postdoctoral position at the new Minnesota State University—Rochester.

Jessica Dahlheimer '08 recently reported that she is newly employed as a junior scientist at the Cancer Center of the University of Minnesota.

After graduation, **Zeljko Ostojic '08** returned to Bosnia to marry his fiance, Rada. The couple have recently welcomed their first son, Aleksa. Zeljko is employed by the Institute for Waters in his hometown of Bijeljina and is working on a master's degree in Environmental Chemistry at the University of Belgrade.