



SUMMER 2012

Alumni & Friends Newsletter

DEPARTMENT OF
CHEMISTRY

UNIVERSITY OF NEBRASKA-LINCOLN

Dear Alumni and Friends,

I just returned from the 244th ACS National Meeting in Philadelphia. The meeting was great, the weather near perfect. A highlight for me was our alumni and friends hospitality hour held Tuesday evening at the Triumph Brewery. Located just beyond Independence Hall, the Triumph provided not only a great location, but food and drink to match. The event, co-sponsored with the chemistry departments from Northwestern and The Ohio State University, was the third co-sponsored reception held in conjunction with the Fall ACS meeting. We enjoyed our best turnout yet. It was a special treat for me to have several former students attend.



The Fall ACS meeting also means it is the start of classes at UNL, which leads to seeing a collection of excited new faces among our undergraduates and graduate students. This year, we have instituted a new CHEM 101 seminar class for freshman chemistry majors. The course, being developed by second year faculty member Prof. Marilynne Stains, will focus on the different careers to which a chemistry degree can lead and introduce students to opportunities to expand their skills and knowledge set as they progress through the chemistry curriculum. Twenty-one bright and energetic freshmen are enrolled for the Fall.

Twenty-eight new graduate students started this Fall. I had the opportunity to meet with them at a chat-with-the-chair session during orientation and again earlier this week as part of the revised CHEM 898A Introduction to Graduate Research seminar series. My interactions with them were great. I cannot wait to see this group of graduate students develop in our program.

Many of you already know the "old news," that 2nd floor south was completely remodeled with new teaching laboratories for the CHEM 109 students. The "new news" is that 2nd floor north is nearing the end of the demolition phase for its complete remodel as well. Once completed in December, all CHEM 100-level laboratory classes will be held in completely redesigned, remodeled laboratories. The labs are designed not only to accommodate all students currently taking 100-level labs, but have the capacity to accommodate a 30% enrollment increase above current levels. In addition, the 2nd floor plan houses newly configured, combined prep labs for both 100- and 200-level lab courses.

As I am sure is the case for many of you, we have survived the very hot, dry summer and are looking forward to the arrival of Fall. I hope some of you will make it to campus and find your way back to Hamilton Hall where I look forward to greeting you.

All the best,

Jim Takacs
Charles J. Mach University Professor and Chair of Chemistry



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DEPARTMENT OF CHEMISTRY

Story ideas, activities and achievements can be submitted by sending an email to kerry.vondrak@unl.edu. Receipt does not guarantee publication and the editor reserves the right to edit for space, clarity, grammar and style.

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Updates

Alumni members, now you can update your contact information by visiting <http://chem.unl.edu/dept/alumnreg.shtml>.

Support the Chemistry Department

If you would like more information about specific needs of the department, such as graduate and undergraduate fellowships/scholarships, award lectureships, or research instrumentation, please contact:

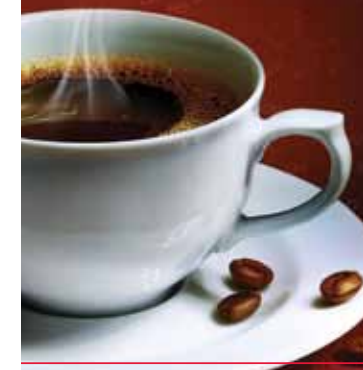
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AWAKEN YOUR SENSES

Explore your sensibility to chemistry



Chemistry Day Designed to Awaken Your Senses

Another “can’t miss” event for high schoolers will be Chemistry Day this October 13th. It is a free all-day event from 8:30 a.m. to 3:30 p.m. filled with hands-on demonstrations, tours of the chemistry labs, a Chemistry Quizbowl, Chromatography T-Shirt Classes, Scholarship Information and Awards, and plenty of prizes for participation. If you know of any students that would be interested in attending, please encourage them to sign up at www.chem.unl.edu/chemday today. Additionally, if you would be interested in sponsoring one of the Chemistry Day events or would like to be an exhibitor showcasing your company at the morning fair, just call Kerry Vondrak at 402-472-4453.

Novartis Donates Instrumentation

Elizabeth Needels, an undergraduate researcher in Barry Cheung’s lab, started the ball rolling on a donation of instrumentation by asking her father, Jeff Needels, who works in R&D at the Novartis Lincoln facility, for a used HPLC. This happened to be at the same time that the R&D group at Novartis in Lincoln was in the process of replacing some older HPLC units and evaluating other instruments that were not being used. As a result, Novartis was able to donate several HPLCs, a Shimadzu UV/Vis spectrophotometer, an AA spectrometer with a graphite furnace, and several other large pieces of instrumentation to the department. This equipment will be used in various undergraduate laboratories and in research under the guidance of the Undergrad Instrumentation Center and the Research Instrumentation Facility (RIF). Several of the instruments will have an immediate impact on research in the department. THANK YOU NOVARTIS!

The History of UNL’s Department of Chemistry, Part 8

Mark A. Griep



E. Roger Washburn in 1933

Photo courtesy John Brackenbury, a graduate student

Washburn was the first of five children born in Decatur, Michigan to Edward R. and Myrtle Washburn. His father was the public school teacher in this small community and must have trained his son well because Roger graduated from the University of Michigan with three chemistry degrees (1921 B.S., 1923 M.A., and 1926 Ph.D.). Roger’s graduate research was under the guidance of Professor S. L. Bigelow (1898 Leipzig) who had trained under Ostwald.

After earning his Ph.D., Roger sent letters of inquiry to several research universities. Within days, the Department of Chemistry at the University of Nebraska–Lincoln wired him an offer, and he immediately accepted. The very next day, he married Dorothy and they traveled dirt roads in their Ford Model T for five days to reach Lincoln. They had met in the University of Michigan chemistry department where she was one of the first women to earn a B.S. After graduation, she took a job as a teacher rather than marry Roger because graduate students and teachers were not supposed to be married in those days. When they arrived in Lincoln, his new colleagues were surprised to meet Dorothy because he had forgotten to tell them he was going to get married. She helped him grade exams until they had their fourth and final child.

Dr. E. Roger Washburn, Professor and Chair

Dr. E. Roger Washburn created the department we’ve known since 1970 even though he died of a heart attack in 1967. His actions led to the funding that enabled construction of Hamilton Hall and the consequent doubling of the number of faculty and graduate students.

Washburn was the first of five children born in Decatur, Michigan to Edward R. and Myrtle Washburn. His father

was the public school teacher in this small community and must have trained his son well because Roger graduated from the University of Michigan with three chemistry degrees (1921 B.S., 1923 M.A., and 1926 Ph.D.). Roger’s graduate research was under the guidance of Professor S. L. Bigelow (1898 Leipzig) who had trained under Ostwald.

Washburn’s lab conducted research on surface and interfacial tension. His earliest ternary studies in the 1930s involved water, an alcohol, and a hydrocarbon. He was clearly engaged in basic research but the practical reason for studying such mixtures is to understand how to separate alcohols from their water azeotropes. The methods sections of his journal articles (almost always published in the *Journal of the American Chemical Society*) describe extensive water distillation, alcohol purification, distillation, and characterization, and usually the purchase of high-grade hydrocarbons that were demonstrated to be pure according to several properties. A set of 10 to 20 mixtures of exact composition were prepared and analyzed for refractive index (see Figure) plus some other parameter such as freezing point depression. Variations in the measured parameters were indicators the alcohol behaved differently in the other two liquids and that it was possible to quantify the alcohol’s polarity.

By the 1950s, Washburn’s lab began using Langmuir troughs to study how hydrocarbons spread on water surfaces. One practical reason for doing this is to understand how oil spills spread but, again, that was not his focus. He was interested in how the oil molecules interacted with each other and with the water molecules when the two met at a flat interface. The number of significant figures shown in all his tables indicates the care with which all measurements were made. His papers are still being cited today!

Washburn mentored 51 students who earned masters degrees and 18 who earned doctorates. Nearly all of them earned their degrees before he became the chair. His most prominent graduates (listing their highest degree and major employer) were: Albert Lightbody (1933 Ph.D., U.S. Naval Ordnance Lab); Leo Mason (1933 M.S., Center for Naval Analyses); Allen Olsen (1934 Ph.D., Naval Weapons Center); Charles Graham (1936 Ph.D., Eastman Kodak); Reuben Osten (1939 M.A., Dupont); Herbert Fernald (1940 Ph.D., Chevron); Gerald Griess (1940 M.A., Dow Chemical); Ralph Miegel (1940 M.A., Dupont); George Hugo Splittgerber (1940 M.S., Colorado State University), Frank Maxey (1941 M.A., Goodyear

Tire & Rubber); Gordon Fisher (1941 M.S., U.S. Department of Agriculture); David Simonsen (1944 Ph.D., Eastman Kodak); Robert Alberty (1944 M.S., Massachusetts Institute of Technology); and Kotaro Murai (1945 M.S., Pfizer).

Roger Washburn was the seventh chair of the Department of Chemistry. His photo in the Cromwell Conference Room gives the impression of someone who was rather formal and who perhaps lacked a sense of humor. As chair, Washburn hired eight faculty in nine years (Table 1). He concentrated on recent graduates from Midwestern schools as had his predecessors. The only exception was Desmond Wheeler from Ireland. Among his hires, only biochemist Jim Mattoon left our department. Mattoon first took a position in the biochemistry department at Johns Hopkins but finished his long career in the biology department at the University of Colorado, Colorado Springs.

Washburn was chair of the department between 1955 and 1964. During this time, the department experienced a tripling of undergraduate course enrollments, 60% growth in the number of its graduate students (up to 74 total students), and 50% increase in the number of faculty. By 1972, the number of graduate students and faculty were double what they were when he became chair. With 20/20 hindsight, his most significant act occurred in Fall 1963 when he formed a committee to study the future needs of the department. The January 1964 report said the department would require 80,000 sq. ft. more by 1968 for research and a complete overhaul of the equipment used in undergraduate laboratory courses. The University Administration presented the report to the Nebraska Legislature. In 1965, the Legislature allotted \$5.2 million to construct a 208,000 sq. ft. building. The Administration used those funds as a match to obtain an additional \$3.6 million from the U.S. Department of Education.

Washburn’s timing couldn’t have been better. In 1964, the National Science Foundation began a program to create “Centers of Excellence” to ensure national and regional prosperity. The program favored science departments with distinguished faculty that lacked funds to hire new faculty or purchase instrumentation. The program required a detailed growth plan and a guarantee to spend the funds within 3-5 years. In 1967, the University of Nebraska’s Department of Chemistry became one of the first Centers of Excellence. The funds were used to purchase \$300,000 of equipment and \$530,000 on setting up laboratories for new faculty hires.

In November 1963, Roger had his first heart attack. He recovered quickly but passed the chairship to Norman Cromwell. Roger’s health forced him to retire in July 1967 and he died of a second heart attack one month later. He wasn’t around to see the construction of Hamilton Hall which began in 1969 and was completed in 1970.

Today, Washburn’s name is often mentioned in the department for the lectureship that bears his name. Since its inauguration in 1975, the speakers in this series have most often discussed the nature of molecular interactions or how chemicals have distinct property sets. Roger Washburn devoted his career to chemistry and the department. He leaves an impressive legacy.

Table 1: Faculty Hired by Roger Washburn

| Name | Time at UNL | #Years | Ph.D. |
|-----------------------|-------------|--------|---------------------------|
| Demuth, John R. | 1955-1989 | 34 | Univ. Illinois |
| Gallup, Gordon A. | 1955-1993 | 38 | Univ. Kansas |
| Mattoon, James R. | 1957-1964 | 7 | Univ. Wisconsin |
| Scholz, John J. | 1957-1988 | 31 | Univ. Illinois |
| Larson, Robert G. | 1961-1985 | 24 | Univ. Kansas |
| Wheeler, Desmond M.S. | 1961-1993 | 32 | National Univ. of Ireland |
| Rack, Edward P. | 1962-1996 | 34 | Univ. Michigan |
| Sturgeon, George D. | 1964-2003 | 39 | Michigan State Univ. |



Immersion Refractometer (Bausch & Lomb) purchased by Washburn in 1931 to measure his ternary mixtures.

Photo courtesy Mark Griep

Alumna Reminisces About “Cotton Club”



Vicki Schlegel

Masters alumna Dr. Vicki Schlegel’s fondest memories of UNL are of the “Cotton Club.” She explains, “I am not entirely sure how we acquired this name, but it started with our group (Dr. Cotton’s first research group at UNL) and was passed on to her subsequent groups.” Schlegel reminisces that the work was intense, but the camaraderie and collective support of the entire group was amazing.

“We were truly a team but

also good friends. I also recall laughing a lot... I don’t think I have laughed that much before or since graduate school.” Schlegel went on, “The tone of our laboratory group can be credited to Dr. Cotton as she was an incredible mentor.”

Schlegel remembers a conversation she had after Dr. Cotton’s son died in a car accident. Schlegel was expressing her condolences to her, and Dr. Cotton said, “Vicki, you don’t know how strong you really are until you go through times like these.” Those words really made an impact on Schlegel. “She had such dignity and grace during a very difficult time, which has always stayed with me. Dr. Cotton passed away of cancer in 1998. As a research director myself, I try to live up to her example as best as I can.”

Schlegel’s decision to pursue analytical chemistry in graduate school was mainly due to the fact she wanted to work with Dr.

Cotton. Dr. Cotton was a Raman spectroscopist with an expertise in applying this method to biological systems, which was not common at the time. Actually, Dr. Cotton’s lifetime accomplishments were renown in her field.

Schlegel earned her masters degree in 1987. Her research focused on understanding the surface enhanced Raman spectroscopic effect of silver films and then developing suitable substrates to optimize this effect. For her Ph.D., she then applied these methods to biological systems, using both conventional surface enhanced resonance Raman methods and micro Raman, again a new method at the time. As a result of the latter research, she became interested in bioanalytical chemistry.

Today, Schlegel is an associate professor and research director for the Department of Food Science and Technology at UNL. Schlegel explains, “My current research interests are developing and applying metabolomic methods for understanding the synergistic interactions of plant secondary metabolites (nutraceuticals) and as such their ability to promote human health. I am specifically interested in Nebraska grown commodities, such as dry edible beans and wheat.” Schlegel continues, “As my research interests require multiple analytical methods, I use the background and experience I obtained from graduate school every signal day. Unfortunately, I no longer have Raman capabilities, but I am working on that.”

Schlegel’s accomplishments are many but out of humility she is most proud of her students’ many successes. “There is nothing better than watching your students progress from insecure scientists to fully owning their research. Most of all, I want them to continue looking at everything with imagination and curiosity. Can’t get better than that.”

Former UNL Chemistry Professor Finds a Way to Remember Fellow Faculty Members



Robert Marianelli

Dr. Robert Marianelli was a UNL chemistry professor 35 years ago but continues to make a difference for the university and its students after all of these years.

Dr. Marianelli began his distinguished career at UNL in the fall of 1966 as a chemistry professor. Before coming to UNL, he earned his undergraduate degree with the University of Delaware and his Ph.D. at UC Berkley.

“I really enjoyed my time at UNL,” Dr. Marianelli recalls. “While I was here, I helped the Chemistry Graduate Program become more efficient. With my

assistance, the department modified the program so it reflected a more reasonable amount of course work, exams, and research. Plus, they included more emphasis on research. It used to take a graduate student up to 9 years to complete their Ph.D. Now it takes 4-6 years.” However, Dr. Marianelli says he felt he would be a much better research administrator than teacher or researcher. So in 1977, he took a two-year leave of absence and started working with the Energy Research and Development Administration (ERDA), later known as the Department of Energy (DOE), on a temporary basis. However in 1979, Marianelli accepted a permanent position with the DOE and left UNL.

While with the Department of Energy he served 8 years as a program manager, a short stint as a branch chief, and 12 years as director of the Chemical Sciences Division. During his tenure with the DOE, he helped identify and foster many extremely bright scientists, six of whom went on to earn Nobel Prizes, perhaps the top honor a scientist can receive. The six Nobel Laureates were

Professor Carolyn R. Bertozzi Named for Spring Hamilton Award



Carolyn Bertozzi

Carolyn Bertozzi, from the University of California, Berkeley, was awarded the 2011-2012 Hamilton Award in recognition of her outstanding contributions to organic chemistry and chemical biology, especially for fundamental research leading to the better understanding of cellular processes and interactions at cell surfaces.

Bertozzi is the T.Z. and Irmgard Chu Distinguished professor of Chemistry and

Professor of Molecular and Cell Biology at UC Berkeley and an investigator of the Howard Hughes Medical Institute. She completed her undergraduate degree (summa cum laude) in chemistry from Harvard University in 1988 and her Ph.D. in chemistry from UC Berkeley in 1993 (advisor, Mark Bednarski). After an American Cancer Society Postdoctoral Fellowship at the University of California, San Francisco, in the field of cellular immunology (advisor, Steven Rosen), she joined the UC Berkeley faculty in 1996. She was promoted to associate professor in 1999, and full professor in 2002. Prof. Bertozzi holds several additional positions, including professor of Molecular and Cellular Pharmacology, UCSF; director, Biological Nanostructures Facility of The Molecular Foundry (LBNL); and senior faculty scientist, Lawrence Berkeley National Laboratory. She also served as the director of The Molecular Foundry at Lawrence Berkeley National Laboratory.

Bertozzi transformed the field of chemical biology with the notion that chemical reactions can be designed with such exquisite specificity so as to proceed in environments as complex and richly functionalized as living organisms. Bertozzi termed such

reactions “bioorthogonal chemistry” and her ideas have launched what is now a major effort in chemical biology research around the world. The chemistries that Bertozzi and those inspired by her groundbreaking work have developed are seeing widespread application in biomedical research. Bertozzi’s own work translating bioorthogonal chemistry into new approaches for in vivo imaging, disease biomarker identification, and biotherapeutic development have brought the impact of her chemical approaches into sharp focus. Several of her inventions have been commercialized for diagnostic and therapeutic applications.

Prof. Bertozzi has been recognized with many honors and awards for both her research and teaching accomplishments. She was an elected member of the National Academy of Sciences in 2005 at the age of 39, one of the youngest chemists in the history of the institution. She has also been elected to the American Academy of Arts and Sciences and the German Academy of Sciences Leopoldina. She has been awarded the Whistler Award, the Ernst Schering Prize, a MacArthur Foundation Fellowship, the ACS Award in Pure Chemistry, the Presidential Early Career Award in Science and Engineering, and the Irving Sigal Young Investigator Award of the Protein Society, among many others. Her efforts in undergraduate education have earned her the UC Berkeley Distinguished Teaching Award and the Donald Sterling Noyce Prize for Excellence in Undergraduate Teaching. Prof. Bertozzi participates in high-school outreach programs such as the Catalyst Program sponsored by the Camille and Henry Dreyfus Foundation, as well as programs that promote the participation of women in science. She was given the Li Ka Shing Award for Women in Science in recognition of these efforts.

Yuan Lee, Dick Schrock, Bob Grubbs, Sherwood Rowland, Donald Cram, and Richard Smalley.

In addition, Dr. Marianelli helped develop, plan, and manage several successful DOE facilities. For example, he assisted with planning the creation of the Environmental Molecular Science Laboratory at the Pacific Northwest National Lab (\$230 million estimate construction cost), oversaw the operations of the Combustion Research facility at Sandia Livermore, and the Stanford Synchrotron Radiation Lab, and partnered with the National Science Foundation (NSF) to fund and develop the Environmental Molecular Science Institutes.

In 1998, during the Clinton Administration, Dr. Marianelli took a position as the assistant director for Physical Sciences & Engineering with the Office of Science and Technology Policy—one of the offices that is part of the Executive Office of the President.

Since retirement, Dr. Marianelli does consultation work with Pacific Northwest National Laboratory, Battelle, and some programs within the DOE Office of Science. He also serves on the Industrial Advisory Board for the UNL Department of Chemistry along with

20 other board members. One of his most prized accomplishments as a board member has been a fund he helped develop.

When the UNL Chemistry Vice Chair Thomas Adrian George passed away, Dr. Marianelli thought, “I could do what others do and just make out a check to a memorial fund but that will never reach endowment level. Then I came up with the idea of a Chemistry Faculty Remembrance Fund.” The idea was to honor faculty who had spent most or their entire career with UNL’s Department of Chemistry. The fund was created to establish an endowed fund for those wanting to honor UNL chemistry professors who impacted their lives. Each year, thanks to Dr. Marianelli and the efforts of others, an award is made in honor of a former faculty member to a deserving undergraduate or graduate student with the spendable income generated by this fund.

Thank you Dr. Marianelli for your years of continued service to UNL’s Department of Chemistry. If you would like to give to this fund please contact 1-800-432-3216 for more information.

Editorial Work

Many of you may know Dr. David Hage is one of the editors of *Journal of Chromatography B*, and we are pleased to announce that two more faculty members have joined the ranks of literary scholars in our department. Prof. Xiao Cheng Zeng has been named as associate editor for the Royal Society of Chemistry journal, *Nanoscale*, and Dr. Robert Powers has earned the position of editor-in-chief of the new journal entitled 'Current Metabolomics' published by Bentham Science Publishers Ltd.

Faculty Awards

- **Stephen DiMagno** was the recipient of the 2012 College Award for Outstanding Research and Creative Achievements in the Sciences.
- **Manashi Chatterjee, Jason Kautz, Neil Lawrence, Hui Li, and Eric Malina** earned their "Certificate of Recognition for Contributions to Students" award sponsored by the UNL Parents Association and the UNL Teaching Council.
- **Dr. Xiao Cheng Zeng** was given a two-year appointment to the College of Arts and Science's College Executive Committee.
- **Dr. Xiao Cheng Zeng** was given the Dean's Award for Excellence in Graduate Education.
- **Dr. Marilyne Stains** is serving on the Chemical Education Research Committee for the American Chemical Society. This is a three-year appointment starting January 1, 2012, to December 31, 2014.
- **Dr. Eric Malina** received a 2012 College Distinguished Teaching Award from UNL.
- **Dr. Eric Malina** was nominated by his students for the Outstanding Educator of the Year Award from the Association of Students of the University of Nebraska (ASUN).
- **Dr. Eric Malina** was nominated for an Academy Award by a National Hispanic Scholar.

New Chemistry Professorship

UNL has awarded a university professorship to faculty member David Hage. He was recognized at the Honors Convocation in April. Terms for the new professorship begin this summer.

Alumni Work

UNL chemistry alum, Paul Harvatin (M.S. 2001) of Gilead Sciences has developed a potential drug for Hepatitis B treatment. Congratulations to the Gilead team on their outstanding work!



Martha Morton

Photo courtesy University Communications

New Faculty Brings New Promise to Research Instrumentation Facility

UNL would like to introduce the newest member of our faculty team, Dr. Martha Morton. She is the director of our Research Instrumentation Facility (RIF). Dr. Morton works with assistant director Sara Basiaga helping make sure everything runs smoothly.

Dr. Morton comes to us from the University of Connecticut (UConn). She worked there for 11 years as their director of the Chemistry Nuclear Magnetic Resonance Spectroscopy (NMR) Lab. Before that, Dr. Morton was a research scientist in the NMR Lab at the University of Kansas for 7 years.

Dr. Morton earned her Ph.D. in organometallic chemistry from the University of Kansas in 1993 and her bachelors of science from Rockhurst College in chemistry in 1987.

Dr. Morton has a diverse background in research working with proteins, carbohydrates, lipids, natural products, polymers, catalysts, and graphene. One of the research projects she is most proud of involves collaborative work with UConn Dental School faculty member, Frank Nichols. Their team isolated a group of lipids that cause system wide inflammation resulting in tooth loss. This finding is beneficial to other medical areas as well because these lipids can be found in the brains of Atherosclerosis and Multiple Sclerosis (MS) patients.

Dr. Morton has big plans for UNL's Department of Chemistry as well. "I came to UNL to serve the university population with instrumental methods to solve research problems," Dr. Morton explains. "For the most part, I work with the NMR spectrometers, but NMR technology can solve only a portion of research problems, and it's not the right tool for all research projects." Her goal is to update the RIF with new instruments and be a resource for faculty and graduate students for instrumental research methods.

Notably, Dr. Morton has been wildly successful in her past positions obtaining grant money in order to purchase the most up-to-date instrumentation and equipment available. Dr. Morton continues, "My greatest accomplishments have been getting grant funding for two instruments and installing three new instruments in one year (2004) at UConn. I'm looking forward to topping this at UNL."

Stephen DiMagno

Photo courtesy University Communications

UNL Chemistry Professor's Research Results in New Startup Company

UNL University Communications

A new startup company will use a process developed at the University of Nebraska-Lincoln by Professor Stephen DiMagno to improve medical imaging.

The new company, Ground Fluor Pharmaceuticals Inc., will use the discovery to develop new imaging agents for use in diagnosis and management of disease, and to help other companies better manufacture imaging agents for positron emission tomography (PET) scans.

DiMagno, a fluorine chemist who began researching this area in 2005, is Ground Fluor Pharmaceuticals' co-founder.

NUtech Ventures, the nonprofit organization responsible for building partnerships between the University of Nebraska and the private sector, worked to evaluate the commercial opportunity and licensed the intellectual property to the startup for development.

Positron emission tomography is a nuclear medicine imaging technique that uses specialized scanners to provide images using radiotracers whose distribution reflects specific metabolic activity in the body at the time of injection. PET images provide information about the function and metabolism of the body's organs, in contrast to computed tomography or magnetic resonance imaging, which show the body's anatomy and structure. PET is used mainly to study patients with cancer, heart disease and neurodegenerative disorders such as Parkinson's and Alzheimer's diseases.

DiMagno found a general way to attach the widely used PET radioactive isotope, 18F, to many different carrier molecules. This isotope acts as a beacon to allow the specific metabolic fate of the compound to be viewed by a PET scanner. Unlike most stable drugs, PET imaging agents tagged with short-lived radioactive isotopes like 18F lose their effectiveness after only a few hours. As a result, these imaging agents need to be produced rapidly and near a hospital or imaging center where they are used.

'Start Up' continued on page 15

Published Research

- **Dr. Xiao Cheng Zeng and Dr. Li Tan** published a joint experimental/theoretical paper that was featured in the *Journal of Physical Chemistry B*.
<http://pubs.acs.org/action/showLargeCover?issue=362743144>
- **Dr. Xiao Cheng Zeng's lab and Dr. Zhongfang Chen** at the University of Puerto Rico published an article in *Nanoscale* and it is featured on the cover!
<http://chem.unl.edu/news/PDF/nanoscale-cover.pdf>
- **Dr. Xiao Cheng Zeng's** research on gold clusters as catalysts for fuel cell hydrogen was featured in the latest news on the NSF Science360 website on Jan. 30 and highlighted on the Nebraska EPSCoR website.
<http://epscor.unl.edu/highlights.shtml>
- **Dr. Cliff Stains and collaborators** published an article in *Chemistry & Biology* detailing the use of direct kinase activity sensors for quantitatively interrogating signaling pathways in individual cancer patients.
<http://www.sciencedirect.com/science/article/pii/S1074552112000051>
- **Dr. Liangcheng Du and collaborators** published a paper in *Biochemistry* and one of their images is being prominently displayed on the journal's website. Dr. Du was also selected as a plenary lecturer for *Mona Symposium 2012!*
<http://pubs.acs.org/doi/abs/10.1021/bi2015025>

Big Red Road Show, Another Success!

The Big Red Road Show is designed to help high school seniors make their final decisions about college. Students of all ages and adults attended this spring event to experience a glimpse of college life at UNL. By all accounts, UNL's tenth Big Red Road Show was a success. More than 3,200 visitors had the opportunity to experience the academic excellence and student life opportunities at UNL.

In the last 10 years, almost 26,000 students and their families have attended the Big Red Road Show. And the Chemistry Booth continues to be a show stopper with demonstrations like our "Elephant Toothpaste," oxidizing gummy bears, and exploding hydrogen balloons to name a few. If you know of any youth interested in chemistry, encourage them to attend next year's Big Red Road Show!



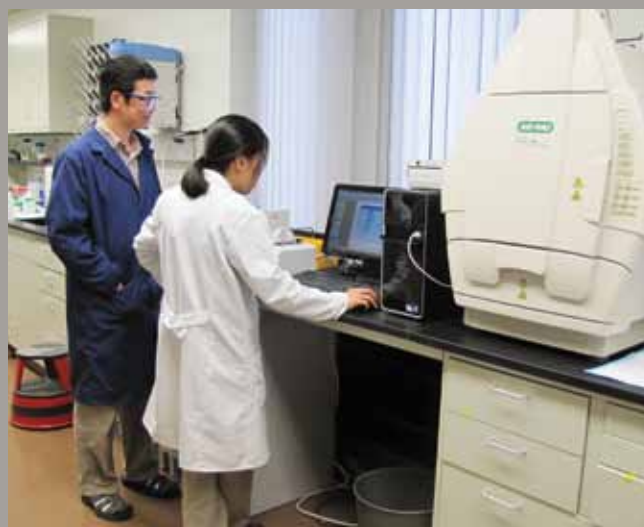
Renovated Undergraduate Lab

Photo courtesy University Communications

We're Renovating!

The Department of Chemistry is pleased to announce that the renovations for the Chemistry 109 labs have been completed. When Chemistry 109 students start classes today they will be utilizing an innovative studio-based laboratory concept with the best quality laboratory design, the latest in A/V technology, and innovative storage for inquiry-based teaching assignments. These new laboratories will allow UNL chemistry to strengthen learning capabilities for future generations.

Similarly, we will be renovating labs and stockroom space in our north wing of the 2nd floor which is adjacent to the new 109 labs. These new labs will be designed and built with similar specification to the 109 labs.



Renovated Research Lab

New Research Labs Too!

Several of our research labs have been renovated as well. Dr. Jian Zhang, Dr. Alexander Sinitskii, and Dr. Jiantao Guo have moved into their newly remodeled labs on the 7th floor. These labs will provide an environment more conducive to instruction, research, and student recruitment.

A glimpse into Dr. Guo's lab details an amazing transformation. His 1,000 sq. ft. multi-purpose lab is ideally designed for their multidisciplinary research at the interface of chemistry and biology. The lab is equipped with four fume hoods for organic synthesis, a biosafety cabinet for manipulation of microorganisms, two island benches for biological research, and a range of modern instruments such as BioTek Synergy H1 plate reader, Agilent 1260 HPLC system, Bio-Rad GelDoc bioimaging system, Sorvall RC-6 floor centrifuge, Allegra X-15R benchtop centrifuge, Eppendorf benchtop microcentrifuges, incubated stackable shakers, microbiological incubators, Eppendorf Mastercycler pro PCR System, NanoDrop 2000 spectrophotometers, nanopure water purifying system, gel electrophoresis system, rotovaps, and small equipment for organic synthesis. Furthermore, the new lab is attached to a 400 sq. ft. office space that can seat eight students, and a separated office space that can accommodate two staff scientists. The new lab space also includes a conference room where group meetings and research discussions can take place.

"With the new state-of-the-art laboratory, the size of our research group has quickly expanded," explains Dr. Guo. In fact, two new graduate students and one postdoctoral researcher will join his lab this summer bringing the total number of researchers in the lab to eleven, including six graduate students, one research assistant professor, one postdoctoral researcher, and three undergraduate research assistants.

"The new lab is an exceptionally pleasant and convenient place to conduct research. Students like the new lab very much, which results in a significant increase in productivity."

Super TA Helps Develop New CHEM 109 Curriculum

Kim Hachiya, University Communications



Emily Bruggeman

How do you make sure a newly designed undergraduate curriculum for your most popular course will work and meet its objectives? You have your super undergraduate TA take a look at it.

That strategy worked for the Department of Chemistry who called on "Super TA" Emily Bruggeman to write PowerPoints and teaching aids for the newly overhauled CHEM 109.

Bruggeman, who graduated in December with a chemistry degree, has her eyes on a physician's assistant degree. But she has been an undergraduate teaching assistant since her junior year and has loved every minute of it.

The faculty recognized her extraordinary teaching ability, and they tapped her to help write the new materials critical to teaching in the new labs. She worked with pilot sections this year, working with materials sent by associate professor of practice Eric Malina. Because the current labs lack video monitors, the students were working from handouts rather than PowerPoints.

The old chem labs lacked charm. There was no whiteboard space, no microphones, no work space (read more about the new chemistry labs at <http://scarlet.unl.edu/?p=10522>). The new labs will allow the TAs to put information on overhead monitors so the entire class can see at once what it used to take multiple times to explain.

But the new labs also required someone to put that documentation together, since it had never existed before. Bruggeman was the obvious choice, Malina said.

Bruggeman was flattered, and although it's been a lot of work, she finds it rewarding.

"I knew the material from the old labs, and I could anticipate the questions and where students would have a hard time. With the pilot courses, I was learning along with the students where the bumps would be."

After each class, she highlighted where the students had trouble and suggested ways faculty could tweak lessons for clarity; then she put the PowerPoints together. She plans to review them at semester's end before she considers the project finished.

Bruggeman is a meticulous planner and good teacher.

"If you TA right, there's a lot of preparation work. I take the first 20 minutes of my labs to explain why they are learning how to do the experiment. I want to give the students some guidance and direction. It makes it more relevant. And being pretty explicit cuts down on the frantic emails I get from students."

Bruggeman said some keys to her success as a TA include learning her students' names by the second week of lab, making her labs inviting, and trying to learn about each student so she could understand not only their chemistry experience but why they were taking the course.

She also required written lab reports and is especially interested in students' understanding why an experiment failed or went awry.

"Science doesn't always go ideally," she said. "I want them to think about what they did, and what they would change the next time to get a different outcome."

She sees connections between being a TA and a physician's assistant. "I think I am a good TA, but my heart is really stuck on being a pediatric PA," she said.

"It's about helping people and making a situation the best it can be. TA was very much a part of my UNL career. Chemistry is my way of getting to where I want to be. I think if it were just me and the test tubes, I'd be struggling. I need that people factor to be happy."

She will miss the experience, however.

"In the new labs, those TAs will be really spoiled. They are going to be awesome teaching spaces."

Is she tempted to come back next semester? Not really.

Bruggeman is taking an accelerated course to earn a "certified nursing assistant" license so she can work with patients before entering physician's assistant school next summer. She has applied to three programs but will not learn where she has been accepted until February.

Graduate & Undergraduate Student Awards

- **Jayson Kempinger** – James H. Looker Graduate Teaching Assistant Award *
- **Yali Wang** – Graduate Teaching Assistant Award
- **Yu Zhao** – Graduate Teaching Assistant Award, Graduate Research Assistant Award
- **Sean Smith** – Korean Alumni Graduate Research Assistant Award
- **Brandon J. Burnett** – Robert S. Marianelli Graduate Research Assistant Award *
- **Jacob A. Friest** – Cromwell Graduate Research Assistant Award
- **Lili Lou** – Fuerniss Fellowship Award
- **Rhitankar Pal** – Outstanding Graduate Research Assistant Award
- **Jennifer Gerasimov** – Honorable Mention, Outstanding Graduate Research Assistant Award
- **Monica Kinde-Carson and Matthea Peck** – Honorable Mentions, Outstanding Graduate Teaching Assistant Award
- **Jeanethe A Anguizola, Brandon J Burnett, and Yu Zhao** – Milton E. Mohr 2012-2013 Fellowship Award
- **Joshua Bollman** – T. Adrian George Undergraduate Research Award *
- **Tom Brockhoft** - Featured in February's Academic Stars for his outstanding leadership on the College of Arts & Sciences Student Advisory Board.

* This award is sponsored by generous support of the UNL Chemistry Faculty Remembrance Fund

Please Help Us Congratulate the 2012 Spring Chemistry Graduates

Undergraduates

Adam Welke, Anthony Chase, Sara Eichner, Kelsey Cuvelier, Michael O'Neil, Ryan Wall, Christina Imus, Sara Laimans, Kevin Lofgreen, Adam Fulmer, Evan Benner, Caleb Rhea, Dylan Reynolds, Marcella Ihrig, and Jason Steiner earned their bachelors in chemistry degree!

Graduate Students

Jiliang Hang, Kiel Neumann, Rhitankar Pal, Linlin Qin, and Gonghua Wang earned their doctorate of philosophy in chemistry, and **Scott Pettibone** for earning his master of science. Well done!

Summer Research Program Helps Student Define Career Path



Katelynn Glaspy

For many undergraduates, the opportunity to do chemistry research work over the summer is a dream come true. The National Science Foundation's (NSF) Research Experiences for Undergraduates (REU) program gives undergraduate students just such an opportunity. This summer, UNL's Department of Chemistry, with the assistance of the NSF grant, was able to award 9 REU's out of a student pool of over 500 applicants.

Each student was associated with a specific research project, where he/she worked closely with an assigned faculty member, a grad student mentor, and other researchers. The REU students were granted a stipend, full room and board, and assistance with travel.

For 10 weeks these students lived and breathed research all while attending workshops designed to prepare the students to be successful grad applicants and eventually grad students. However, between all their hard work, we did schedule time for fun with movies, picnics, and various weekend trips to different destinations.

This experience proved very rewarding for the REU students. "The REU program is beneficial because you get to jump into the middle of an actual research project that has the potential to be ground breaking," commented Katelynn Glaspy, an REU student who worked in Dr. Stephen DiMagno's lab. "While having the privilege of being a part of something like that, you are also doing "hands-on" research, getting the feel for what graduate school is like, and the program takes leaps and bounds to help participants prepare for graduate school... Ultimately, this program has better defined my projected career path, and has brought UNL to the top of my 'potential graduate school' list."

Another student was amazed how his research experience at UNL changed his outlook toward chemistry and future prospects. "My knowledge and skills in an organic chemistry lab setting have grown immensely," stated Kyle Nash. "Not only has my experience here greatly increased my ability to interpret and execute lab procedures, it has also given me a glimpse into how the upper echelons of the scientific community operate. The experience as a whole has only increased my desire to participate in research and attend grad school."

Applause Award Recipient



Darrel Kinnan

Darrel Kinnan

Our Applause for May goes out to Darrel Kinnan, lab manager in the Department of Chemistry.

As his nominators say:

"Darrel Kinnan is the lab manager "Extraordinaire" for the Department of Chemistry and well deserving of the Applause Award. He has

always put in long hours and continues to take on more work, with the increasing number of students and lab sections to support. Not only is he responsible for the General Chemistry labs, he also sets up demos for the lectures, teaches TA training, and helps out with Chemistry Day and Big Red Road Show. Recently, he has taken on an important role with the lab renovation, being on the advisory committee, being responsible for cleaning out the old labs, storing the equipment, setting up interim lab situations, and then stocking the new labs. This takes an enormous amount of time, energy and expertise. When he is gone for a day it seems to take four people to replace him. And despite all this, he always seems to be in a good mood. I can think of no one more worthy of APPLAUSE than Darrel Kinnan."

"Darrel wears multiple hats, and he wears them all extremely well! For example, he is instrumental in the day-to-day management of the General Chemistry laboratories and the teaching assistants. He also does an amazing job preparing demonstrations for the lectures. Multiple students have commented throughout the semester that the demonstrations are the best part of the lectures! They feel that they learn the most with them. Every demonstration worked and this is entirely due to Darrel and his diligent preparation work. Finally, on Halloween, he comes disguised as a big monster in the General Chemistry lectures and performs a memorable demo with a pumpkin. The students just love this. In short, he impacts the undergraduate education of approximately 2,000 students every semester. Darrel promotes students' learning through the demonstrations in lecture and by ensuring that TAs are well prepared for teaching the laboratories. Darrel is most deserving of an Applause!"

"How do you not give Darrel Kinnan an Applause Award? He is the heart and soul of the undergrad labs. Darrel has played a huge role in ensuring that the new 2nd floor renovated labs were up and running smoothly. He is truly one of those people that you can say 'I don't know what we would do without him.' It is my honor to nominate Darrel for the Applause Award!"

Ovation Award Recipient



Brittany Adams

Brittany Adams

Our Ovation for March goes out to Brittany Adams, student worker in the Department of Chemistry.

As her nominators say:

"Brittany has been with the department for a year and a half and in that time Brittany has proven to be a great asset. Brittany helps keep

the department running by constantly stocking shelves in the department stock room. In addition, Brittany individually bar codes all the chemicals in the department, a truly heroic undertaking. Lastly, Brittany is a pleasure to work with and an Ovation Award would be an excellent way to show the department's appreciation for all her efforts."

"Brittany Adams is very deserving of an Ovation Award. For the past few months, she has worked in the purchasing area of the Department of Chemistry, helping out wherever she is needed. She may be delivering mail, large packages, or even boxes of copy paper. She handles most of the bar coding of chemicals and other items for the department, and whatever else she may be asked to do. She also was an Undergraduate Chemistry Lab teaching assistant for a semester. She does this with a smile and a willing attitude. Having to work while being a full time student is never easy, but Brittany seems to be able to handle both."

"Brittany has the type of personality that just lights up a room wherever she goes. Not only does she help with day-to-day activities of the purchasing office, but she is always willing to go above and beyond. She never questions, she just does the work and always with a smile. It would be a great honor to award Brittany with the Ovation!"

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Follow the UNL Department of Chemistry on Twitter! Keep up-to-date on department awards, events, and research by following @UNLChemistry on Twitter.



Join the University of Nebraska-Lincoln Chemistry Alumni group on LinkedIn and reconnect with professors, colleagues, classmates, and friends! The Department of Chemistry Alumni group will help you expand and strengthen your professional networks while keeping you posted on all of the happenings in the department.

Chemistry Alumni Website:

<http://chem.unl.edu/alumni/index.shtml>

Offering:

Class Listings:

Current listings of Ph.D., M.S., and B.S./B.A. graduates.

Connections:

Career Networking Services provide links to job listings, help with chemistry job searches, and provide opportunities to use Chemistry Facebook Group and LinkedIn for social and professional networking. Update your contact information by sending to alumni@huskeralum.org.

Events/News:

Keep up with current events, past happenings, alumni newsletter, alumni stories.

Support the Department:

Learn how to support the UNL Department of Chemistry through a variety of ways.

Alumni Updates

Ronald Alden Wankel Sr. ('49, Ph.D., Cromwell) is retired after a long career with Tennessee Eastman Company, a division of Kodak. Dr. Wankel's last position was general manager of the Photographic Chemicals Division. He is enjoying his retirement by gardening and visiting with grandkids and great grandkids.

Robert Auerbach ('71, Ph.D., Kingsbury) is currently a technical director with Estron Chemical and lives in Paducah, KY.

Donald Nagel ('71, Ph.D., Cromwell) is professor emeritus with the University of Nebraska Medical Center and currently lives in Omaha, NE.

Jim Hohman ('79, Ph.D., Wheeler) is currently the chair of the chemistry department at Fort Hays State University in Hays, KS.

Dan Draney ('80, Ph.D., Kingsbury) is now working as the Reagent QC Manager at LI-COR Biosciences in Lincoln, NE.

Dana Durham ('81, Ph.D., Kingsbury) is working with Syrgis as their Vice President of Research, Development, and Innovation and currently lives in Pittstown, NJ.

Pradip Das ('85, Ph.D., Meisels) is now enjoying retirement from Merck & Co, Inc. in Bound Brook, NJ.

Shiyong Wu ('90, M.S., '92, Ph.D., Gupta) is currently employed at Ohio University as a professor in Athens, OH.

Paul Harvatin ('01, M.S., Takacs) is working with Gilead Sciences and has developed a potential drug for Hepatitis B treatment.

Zhongli Zhang ('01, Ph.D., Smith) is working with Irvine Pharmaceutical Services as their associate director in Irvine, CA.

Lewis Stevens ('05, Ph.D., Eckhardt) is working with AgSource Cooperative Services as the manager of Laboratory Technology and Development in Lincoln, NE.

Jay Steinkruger ('06, B.S., Redepinning) is currently employed at the University of Central Missouri as their assistant professor of Organic Chemistry in Warrensburg, MO.

Alumni names are followed by year of graduation, degree and adviser

Chemistry Faculty Remembrance Fund

The UNL Chemistry Faculty Remembrance Fund was created to establish an endowed fund for those wanting to honor professors who impacted their lives.

Each year, an award will be made in honor of a former faculty member to a deserving undergraduate or graduate student with the spendable income generated by this fund. Please consider making a donation today by visiting <https://nufoundation.org/SSLPage.aspx?pid=2078&chid=25>.

'Start Up' continued from page 9

"Our methodology allows us to create more potent imaging agents more rapidly, reliably and in high yield. These agents were previously unknown or were very difficult to synthesize," DiMagno said. "Ground Fluor Pharmaceuticals' technology should boost the availability of existing experimental PET agents and support the more efficient development of new PET imaging agents."

Ground Fluor Pharmaceuticals may also help expand the types of diseases that PET scans can diagnose, leading to more effective treatments and better management for these disorders. The company's technology is expected to produce an equivalent imaging signal from lower doses of PET pharmaceuticals than is possible using current methods, DiMagno said. The higher potency (known as "specific activity") of PET agents produced with the new technology could reduce the risk of side effects and significantly lower costs to patients and insurance companies.

Ground Fluor Pharmaceuticals is working with NUtech Ventures, several academic medical centers and manufacturers of imaging agents to advance commercialization.

"UNL and NUtech have gone out of their way to encourage entrepreneurship to make this technology available to clinical imaging centers around the country," DiMagno said.

NUtech also helped recruit Boston-based physician, scientist and attorney Allan Green to partner with DiMagno. Green is the company's president and chief executive officer.

"We knew this technology had significant potential based on initial assessments by industry experts," said David Conrad, executive director of NUtech Ventures. "By matching Dr. DiMagno's scientific expertise with Dr. Green's knowledge of medical imaging and the FDA regulatory environment, Ground Fluor Pharmaceuticals is well positioned to make a big impact in medical imaging."

DiMagno was the lead on one of 23 teams nationwide to receive an inaugural National Science Foundation Innovation Corps (I-Corps) grant in late 2011. The grant provided the team access to national experts on technology startups and additional training in the latest concepts in entrepreneurial management.

In late spring of 2012, NSF further supported Ground Fluor with a \$150,000 Small Business Innovative Research award to develop and provide its novel materials for the preparation of PET imaging.

University Technology Development Corp. provided proof-of-concept funding to help move DiMagno's imaging agents out of the lab and into clinical trials. Supporting the transfer of university technology to the marketplace, UTDC is a University of Nebraska affiliate and the parent company of NUtech Ventures.

Ground Fluor Pharmaceuticals will house its research and development facility in Lincoln. The company will also have an office in Cambridge, Mass., to support business and finance.

Where are they now?

Attention alumni! We want to know where you are and what you're doing! Please take a moment to answer the following questions and return your responses by mail to:

University of Nebraska-Lincoln
Department of Chemistry
515A Hamilton Hall
Lincoln, NE 68588-0304

Or, email your responses to: kerry.vondrak@unl.edu

Name: _____

Degree: _____

Year Earned: _____

UNL Adviser: _____

Email: _____

Current and past career positions: _____

Please let us know of any significant events in your life and/or career since leaving the University of Nebraska-Lincoln. Also, please feel free to send any photos and/or recollections of your time here at UNL!

Update Contact Information:

Alumni members, now you can update your contact information by visiting <http://chem.unl.edu/dept/alumnreg.shtml>.

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