

## The Director's Letter

Two thousand and twelve was another busy year for faculty, students, and staff at the Adams Institute, and brought its members progress and recognition in research and education.

Despite the challenging economic conditions and scarcity of research funding, Adams Institute researchers continued to win support in 2012. The National Institutes of Health funded Heather Desaire, Craig Lunte, and Mike Johnson; David Weis received an NSF CAREER award; Mario Rivera and Bob Dunn received funding from NSF. The Adams Institute received an 11 million dollar COBRE award from NIH.

A number of honors were bestowed on Adams faculty members, including a very special award that I was very surprised to receive. Chancellor Gray-Little and Research and Graduate Studies selected me to receive the Dolph

Simons Award in Biomedical Sciences, one of the four Higuchi-KU Endowment Research Achievement Awards presented in 2012. It was a great honor to receive this award, and I would like to thank everyone who helped to make it possible by supporting me throughout my career at KU.

George Wilson, Distinguished Professor Emeritus of Chemistry and Pharmaceutical Chemistry, received a much-deserved honor when he was selected to receive the J. Calvin Giddings Award for Excellence in Education presented each year by the Analytical Division of the American Chemical Society (ACS). The Giddings Award is presented to an ACS member who has enhanced the personal and professional development of students in the study of analytical chemistry.

The newest NIH Center for Biomedical Research Excellence at KU, funded in September, is up and running. The Center for Molecular Analysis of Disease Pathways will be administered from the Adams Institute, and will enhance the ability of investigators to compete independently for funding. The CoPIs for this proposal, Blake Peterson, Regents Distinguished Professor of Medicinal Chemistry, and Erik Lundquist, Professor of Molecular Biosciences, have joined the Adams team as well.

May I wish you all the best in 2013, and thank you for your continuing support of the Adams Institute.

Susan Lunte  
Director

## Sue Lunte Awarded NIH COBRE Grant



A new \$11 million, five-year grant will enable University of Kansas researchers to better understand the molecular basis of diseases such as cancer and neurodegenerative disorders such as Parkinson's, Alzheimer's and Huntington's.

Funding from the National Institutes of Health will create a Center of Biomedical Research Excellence (COBRE): The Center for the Molecular Analysis of Disease Pathways (CMADP). The grant was awarded to Susan Lunte, the Ralph N. Adams Distinguished Professor in the Departments of Chemistry and Pharmaceutical Chemistry, and Director of the Adams Institute for Bioanalytical Chemistry. The new COBRE Center will be housed in and administered by the Adams Institute.

Sue is joined on the project by co-investigators Blake Peterson, Regents Distinguished Professor of Medicinal Chemistry, and Professor Erik Lundquist of the Department of Molecular Biosciences, where he is also director of the Genetics Program.

"The center is focused on the use of so-called 'model organisms' to study human disease," said Lunte. "These include zebrafish, fruit flies and nematode worms, species that share many human genes and molecular pathways. We can study these simpler creatures to better understand molecular signaling pathways that underlie human diseases."



## Chemistry REU Program Going Strong in 25th Year



For 25 years the KU Chemistry Department has been a Research Experiences for Undergraduates (REU) site. The REU program, funded by the National Science Foundation (NSF), provides students from primarily undergraduate institutions with ten weeks of summer research experience directed by KU Chemistry faculty members.

REU site director Prof. David R. Benson helped recruit a total of 13 participants for this year's program. On Thursday, June 28th, these students gave oral presentations on their summer projects at a "Research in Prog-

ress" Symposium. Following the symposium, members of the KU Chemistry Club hosted a liquid nitrogen ice cream social, where REU students used chemistry principles to make a tasty treat.

Throughout the year the Chem Club, co-advised by Dr. Roderick S. Black, demonstrates chemistry concepts at scientific outreach events like the KU Carnival of Chemistry, held each November in Malott Hall.

Of the 13 participants in this year's program, 5 were advised by Adams Institute faculty members.

## Rodi Torres Receives Goldwater Scholarship



Rodi Torres-Gavosto, BS Chemistry major and member of the Cindy Berrie Research Group, was awarded the prestigious Barry M. Goldwater Scholarship. He is one of four KU undergraduates to receive the award this

year. The awards are the premier undergraduate recognition to honor academically gifted students to provide a continuing source of highly qualified scientists, mathematicians and engineers.

A native of Lawrence, he graduated from Free State High School and is the son of Estella A. Gavosto and Rodolfo H. Torres. Upon completing a bachelor's in chemistry, he plans to obtain a doctorate and begin a career as a professor of chemistry, focusing on research in nanomaterials.

## Adams Institute Undergraduates Selected for Chemistry Awards

Undergraduates affiliated with the Adams Institute continue to demonstrate leadership and excellence in research, and to win recognition for these qualities. Six Adams undergraduate researchers were named as award winners during the annual Honors Banquet held each spring.

- Morgan T. Maxon of the Heather Desaire Group received the Alpha Chi Sigma and Physical Chemistry awards.

- Rodi Torres-Gavosto, Cindy Berrie Group, was awarded the Walter Gubar Scholarship.

- Mitchell Newton of the Craig Lunte Group received the Owen W. Maloney Scholarship.

- Erin A. Reid and Mitchell Newton, Craig Lunte Group, received Seo Research Scholarships.

- Erin A. Reid was awarded the Leonard V. Sorg Scholarship.

## Graduate Student News

### Sue Lunte Group Graduate Students in the News



Rachel Saylor, Chemistry graduate student and member of the Sue Lunte Research Group, has received an honorable mention for the National Science Foundation Graduate Research Fellowships. NSF fellowship recipients as well as honorable mentions represent the best among young scientists in the United States. Well done, Rachel!



Congratulations to Caitlin Schupp, a former member of the Sue Lunte Research Group

(graduated May 2012), who was one of twelve recipients of the Graduate Research Competition Award. The Research Competition took place on March 7, 2012 in the Kansas Union, and is sponsored each year by Research and Graduate Studies. Caitlin's award-winning poster was titled "Method Development for the Determination of Neurotransmitters in *C. Elegans* via Capillary Electrophoresis coupled to Laser-Induced Fluorescence Detection (CE-LIF)".

## Students Receive Departmental Awards

Eight Adams Institute graduate students received departmental awards for their achievements this year.

Michael L. Hoggard, Craig Lunte Group, received the Frank B. Dains Award for outstanding first-year teaching assistant. Michael also received the Kuwana Graduate Scholarship.

Daniel F. Clark, Heather Desaire Group, was awarded the J. K. Lee

Award in Analytical Chemistry, awarded each year for superior academic performance and research accomplishments by an advanced doctoral student.

Brad M. Neal, Cindy Berrie Group, was the recipient of the Ernest and Marvel Griswold Award in Inorganic Chemistry, awarded to an outstanding advanced graduate student in inorganic chemistry.

Rachel A. Saylor, Sue Lunte

Group, received the Ralph E. and Esther Weik Badgley Scholarship, awarded to the outstanding female undergraduate or graduate student.

Yunan Wang, Craig Lunte Group, received the Thomas A. Milne Scholarship for women earning their Ph.D. in chemistry for a subsequent career in teaching and research.

Sarah M. Wildgen, Bob Dunn Group, was awarded the Charles and Beatrice Kulier Scholarship for a graduate student in chem-

istry.

Kevin P. Armendariz, Bob Dunn Group, received the McCollum Research Scholarship.

Christina M. Edwards, Cindy Berrie Group, was the recipient of the Takeru & Aya Higuchi Scholarship in Physical Chemistry, a scholarship awarded to a deserving graduate student in physical chemistry.

The Department is proud to honor these accomplished student researchers.

## Faculty News

### George Wilson Recipient of Giddings Award



Distinguished Professor Emeritus of Chemistry & Pharmaceutical Chemistry George S. Wilson has been selected as the 2012 recipient of the J. Calvin Gid-

dings Award for Excellence in Education by the Analytical Division of the American Chemical Society (ACS). The Giddings Award is presented each year to an ACS member who has enhanced the personal and professional development of students in the study of analytical chemistry. Two other Jayhawks who have won this award: Ted Kuwana (2004) and Cindy Larive (2007). Congratulations to George for this recognition of his many contributions to Chemistry Education!

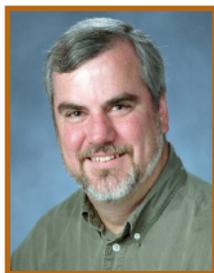
### Heather Desaire Funded by NIH



Professor Heather Desaire was recently awarded a \$1.38 million R01 grant from National Institute of Health for a proposal

titled "Characterization of PTMs on Env to support HIV vaccine development." This research will investigate a group of HIV vaccine candidates and the proteins that make up those candidates. The project could help vaccine developers answer several critical questions, including identifying cell lines in which specific proteins should be expressed and why particular vaccine candidates have especially advantageous properties, such as the ability to bind tightly to desirable antibodies.

### Craig Lunte Receives NIH Grant



Congratulations to Chair & Professor Craig Lunte for receiving a National Institutes of Health grant for \$1.29 million over the next 4 years. This NIH grant is for his proposal entitled "Microdialysis Studies of Seizure-Induces

Oxidative Stress."

The purpose of this project is to investigate the role of epileptic seizures in causing oxidative stress in the brain. The ultimate goal is to elucidate the brain's response to this oxidative stress caused by seizures using microdialysis sampling.

Because epilepsy affects over 1% of the world's population, it is important to better understand how the brain is affected by seizure activity. This project is a collaboration with Professor Ivan Osorio from the Kansas University Medical Center.

### David Weis Awarded NSF CAREER Award



conditions within a cell is still not understood.

Professor David Weis has been awarded a five-year, \$677,000 CAREER award from the National Science Foundation to address this issue. The Weis lab will develop new mass spectrometry-based methods to probe protein structure under crowded conditions and answer the question "Does crowding stabilize intrinsically disordered proteins?"

The recent discovery of functional proteins that are intrinsically disordered, that is, lacking a well-defined structure, has challenged our understanding of protein function. However, the extent to which disordered states persist in the crowded

The grant will also support the development of an introductory course in biomolecular structure by Prof. Weis.

## Sue Lunte Recipient of Higuchi Award for Research Excellence



Congratulations to Professor Susan Lunte for being named one of the four recipients of the state's most prestigious recog-

nition for scholarly excellence: the Higuchi-KU Endowment Research Achievement Awards. Professor Lunte is the recipient of the Dolph Simons Award in Biomedical Sciences and received the award at a ceremony at the Lied Center on Nov. 2, 2012.

Susan is director of the Ralph N. Adams Institute for Bioanalytical Chemistry and director of the recently announced COBRE Center for the Molecular

Analysis of Disease Pathways, funded by the National Institutes of Health. She came to KU in 1987 as an assistant scientist in the Center for Bioanalytical Research, becoming its director in 1994 and a faculty member in 1995. Her academic background includes a bachelor of arts from Kalamazoo College and a doctorate from Purdue University.

In 1981, Higuchi and his wife, Aya, established a program to recognize research accomplishments of researchers at Kansas Board of Regents institutions.

Designed to recognize significant research achievement, these awards were first presented in the fall of 1982. Each award of \$10,000 may be expended over five years in support of the recipient's activities, such as research materials, summer salary, fellowship matching funds, equipment, research assistants, or any other purpose consistent with the advancement of the individual's research program.

Each award is made by the Chancellor upon the recommendation of the Vice Chancellor for Research and Graduate Studies.

## Getting Acquainted



In this issue we will learn more about one of the junior faculty in the Adams Institute, Assistant Professor Yong Zeng.

Yong grew up in the southeast of China. He moved to Wuhan, the biggest city in the central China and attended Wuhan University when his was 17, where he majored in Chemistry and enjoyed being a college basket-

ball official. After graduation, Yong was offered admission to the graduate school at the same university with the honor of being exempted from the National Entrance Examination for Postgraduate. During his Master studies, he started to work on microfluidics and graduated with three first-author publications including his first Anal Chem Paper.

Fascinated by this new field, Yong joined the University of Alberta in 2002 to work with Dr. Jed Harrison, one of the pioneers in microfluidics. During his time at the U of A, he learned skiing besides science. He worked on interdisciplinary projects across microfluidic engineering, sepa-

ration science, proteomics and nanomaterials. He had a lot fun of doing research and teaching, which led to a decision to pursue his career in academia. Yong moved to University of California, Berkeley in 2007 and started his appointment as a postdoc fellow in the Prof. Richard Mathies' group where he expanded his research interest to cancer research. His work on high-throughput single molecule/cell analysis has led to the development of novel approaches for elucidation of early-stage carcinogenic mutations, which may facilitate pre-clinical detection of leukemia.

In 2012, Dr. Zeng joined the faculty at the Department of Chemistry here at KU and is also a KU Bioengineering faculty affiliate. Prof. Zeng's current research interests focus on developing new bioanalytical technologies for quantitative biology and medicine. One of

his main research thrusts is single cell analysis, which is a new frontier in biology that allows us to dissect the complexity of biological systems. This research aims to develop new microfluidic platforms and biochemical assays with single cell sensitivity and resolution. In another line of research, Prof. Zeng's lab is working on integrated and automated microsystems to address the challenges in quantitative proteomic and glycomics. In collaboration with other research groups from KU Chemistry, Bioengineering and KUMC, the Zeng lab is looking at a variety of exciting applications to real-world problems such as cancer and infectious disease.

Yong met his wife, Mei He, when she was a PhD student at the U of A. They just celebrated the arrival of their son, Albert. In his spare time, Yong enjoys watching movie, hiking, camping, and traveling.

## News in Brief

- Congratulations to Sue Lunte Group students Jessica Creamer and Dulan Gunasekara who received awards from the Federation of Analytical Chemistry and Spectroscopy Societies (FACCS) for their posters presented at the SciX conference in Kansas City, Sept. 3 - Oct. 5, 2012.
- Erin Reid, senior chemistry major and member of the Sue Lunte Research Group, has been awarded a Undergraduate Research Award from the Center for Undergraduate Research. Erin's research project is titled "Separation optimization of L-DOPA and its metabolites using microchip electrophoresis with electrochemical detection". She will receive \$1,000 to support her in her research.

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