From the Chair...

There has been a lot of buzz around campus regarding the efforts to grow the university in many ways, including constructing new buildings, increasing research activity, and developing partnerships with the private sector. High on the list of university goals is to attract more students to study at Wichita State. With more students comes not only the obvious influx of tuition dollars, but also the flexibility for the university to reach out in new directions and expand educational opportunities. More students, of course, also provides challenges - which is plainly apparent by looking at enrollment in chemistry classes. Three years ago we offered 8 lecture sections of Chem 211 (General Chemistry I) during an academic year, with 30 lab sections, to accommodate 720 students. During the current academic year, we anticipate 10 lecture sections and 46 lab sections – for a capacity of 1000 students. A commensurate increase has been realized in other classes, including General Chemistry II, Organic Chemistry I and II, and Biochemistry. While some of this increase can be attributed to a small increase in the number of chemistry majors, the vast majority is due to our service role – providing courses for students in other majors. Establishing this capacity has required some creativity in terms of scheduling lectures and labs, assigning instructors and teaching assistants, providing stockroom support, and keeping labs supplied with equipment and materials. We have tried to do this without sacrificing any quality in terms of the educational product presented to our students. As usual, a number of people have stepped up to make this possible, most notably our Laboratory Education Technicians, Susan McCoy and Mary Cambridge, who have led the charge to keep the undergraduate labs running smoothly. Faculty members have stepped up, as well, and we are fortunate to have a few dedicated and long-serving adjunct faculty members to provide consistency and quality to our teaching. Thanks to Dr. Kevin Alliston, Janice Crowley, Dr. John Branca, Dr. Allan Van Asselt, and Susan Arnold for their hard work and adaptability. The staff of the chemistry office also has more issues to deal with, from student enrollment concerns to facilitating end-of-class ACS exams – Debbie Mitchum, Laurie Reese, and Marcia Norton have been up to the task. As the university continues to grow, we will continue to seek out new and better ways to maintain a positive and productive learning environment.

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Wichita State University
Equipment Donations
We are continuously endeavoring to increase the instrumentation infrastructure of the department to support both our teaching and research functions. In most cases, this involves the purchase of new equipment, but sometimes we are fortunate to receive donations of gently used equipment. The past few months have seen a few generous donations of this type to the Department of Chemistry.

Computers. An undergraduate student in our department, David Linder, brought to us an offer of 10 computers from his wife’s employer, Andover Veterinary Clinic. Many of these core 2 duo computers have already taken up positions controlling departmental instrumentation, providing an upgrade over the computers that were previously being used.

Inductively Coupled Plasma – Optical Emission Spectrometer. The newest addition to our Physical Chemistry laboratory, this Varian ICP-OES was donated by Systech Environmental Corporation in Fredonia, KS. Dr. Langenwalter rented a truck and drove down to Fredonia to pick it up. After a few electrical modifications, it will be up and running and will provide new capabilities, as well as giving our undergraduate students another technique to which they will be exposed.

Gas Chromatograph. Hospira Pharmaceuticals in McPherson donated an Agilent 6890N GC complete with autosampler. Former graduate student Champika Jayasinghe, who now works at Hospira, arranged for this donation. This instrument will be used for research purposes, as well as in our organic chemistry labs and in the Forensic Science labs.

Undergraduate Research and Creative Activities Forum
The 14th annual WSU URCAF was held on April 8, 2014. Four chemistry students participated in this year’s conference, listed below with the titles of their presentations and their faculty research mentors:

- Thanh Nga Van (pictured at right) “Defining The Natural Ligand For The Anthrax Toxin Receptor” (Bann)
- Afiqah Ayauf (pictured at left) “Molecular Dynamics Simulations of Organic Compounds as Pure Solvents and in Aqueous Solution” (Mitchell-Koch)
- Emily Lancaster “Synthesis of Iron (III) NNS Coordination Complexes” (Eichhorn)
- George Elkouri “Translational Studies of the Role of Palladin in Breast Cancer Invasion” (Beck)

Graduate Research and Scholarly Projects Symposium
For the first nine years of its existence, all applicants to GRASP were accepted into the symposium for at least a poster presentation, with competition to make an oral presentation. For the 2014 symposium, the decision was made to limit the number of oral AND poster presentations. Therefore, the chemistry students who were chosen to present at GRASP are definitely to be congratulated. They were:

- Jayangika Dahayake, “Kinetics of Prepreg Epoxy Resin Curing for Aircraft Body Repair” (Mitchell-Koch)
- Aruna Jayasinghe, “Synthesis of a Charged Receptor with a Bis-phenolic Ether Scaffold and its Binding Studies with Phosphatidylglycerol, a Bacterial Membrane Lipid” (Burns)
- Eric Oweggi, (pictured at left) “Photocatalytic Conversion of CO$_2$ to CO and its Study in the Production of Acrylic Acid” (Rillema)
- Zifan Wang, (pictured at right) “Fluorescence Correlation Spectroscopy: A Quantitative Study of pH Responsive Catanionic Surfactant Vesicles for Drug Delivery” (English)
- Chandana Kasireddy, “Computational Studies on Tautomers of Fluorinated Histidine and Fluorinated Imidazole” (Mitchell-Koch)
- Lava Kadel, “New Sandwich Complexes of Cyano-Substituted Polypyrazolylborates” (Eichhorn)
- Qiyang Zhang and Naveen Maddukuri, “CE-LIF Coupled with PDMS-Interconnected Microfluidic Systems for Rapid Separations of Neurotransmitters” (Gong)
New faculty member

It is a pleasure to announce the appointment of our newest faculty member.

Alexandre Shvartsburg is a new Assistant Professor in Analytical Chemistry. Dr. Shvartsburg is a native of Russia and received his MS in chemistry from the University of Nevada and his PhD from Northwestern University, under the direction of Martin Jarrold. After completing a postdoctoral position at York University in Toronto and a fellowship at the US Food and Drug Administration, Dr. Shvartsburg spent the last ten years as a Senior Scientist with the Pacific Northwest National Laboratory. Dr. Shvartsburg is an internationally recognized expert in ion mobility spectrometry (IMS), specifically field asymmetric waveform IMS (FAIMS) and coupling of this technique to mass spectrometry. His research will involve continued instrumentation and methodology development, as well as applications to a broad range of problems, including biological analyses and nanomaterials. Dr. Shvartsburg will establish and oversee a mass spectrometry facility in the WSU Chemistry department to support his own research efforts and to collaborate with other research groups for mass spectrometric analysis. Dr. Shvartsburg’s wife, Irina, is a registered nurse and they have two children, aged 5 and 1.

We welcome Alex to our faculty and wish him the best of luck as he begins his career at WSU.

WSU Presentations at MWRM 2014

This year’s Midwest Regional Meeting of the American Chemical Society was held on the campus of the University of Missouri in Columbia, MO. Fourteen WSU Chemistry department members (students and faculty) were in attendance and presented the following papers:

- **Naveen Maddukuri** (Gong group). Fluorogenic Derivatization of Amino acids for Laser-Induced Fluorescence Detection in Capillary Electrophoresis.
- **Qiyang Zhang** (Gong group). PDMS-interconnected Microfluidic Systems for Rapid Separations of Neurotransmitters.
- **Maruthi Alsuri** (Burns group). Preparation of ammonium receptors that target bacterial membranes.
- **Lava Kadel** and **John Kromer** (Eichhorn group). A Novel Method for the Synthesis of Highly Substituted Pyrazoles
- **Nilmini Senaratne** (Eichhorn group). Synthetic models for Nickel Superoxide Dismutase (NiSOD).
- **Chamila Kadigamuwa** (Wimalasena group). Neuronal cell toxicity of fluorescent molecular probes structurally similar to MPP+.
- **Sumudu Mapa** (Wimalasena group). 4- Iodo-1-methyl-4-phenylpyridinium (4I-MPP+) as a probe to study the mechanism of dopaminergic cell death in Parkinson's disease.
- **Christopher Thacker** (Burns group). Development of targeting systems for bacterial membranes.
- **D. Paul Rillema**. ACS Division of Chemical Education: What it offers you.
- **Archana Mishra** (English group). Experimental and computational studies of micelle-mediated *in situ* generation of bromine for selective oxidation of alcohols.

Watkins and Molecular Biosciences Speakers

The Department of Chemistry was pleased to host **Dr. Stephen Padgette** as a Watkins Visiting Professor on Oct. 28-29, 2014. Dr. Padgette is the Vice President for R&D Investment Strategy in the Global Strategy Group at Monsanto. He is the co-inventor of the gene which confers the Roundup Ready (RR) trait and led the FDA and USDA regulatory science safety studies for RR soybean, cotton, and canola. Dr. Padgette’s two lectures were entitled “Sustainable Solutions for farming” and “Innovations in Agriculture.” The Watkins Visiting Professorship, shared by the departments of Chemistry, Biological Sciences, Geology, and Physics, was created in 1974 by the Watkins Foundation. This grant is now provided through the Watkins fund, a part of the Wichita State University Foundation’s endowment.

The department also hosted one Molecular Biosciences Lecturer, which is a program we share with the Department of Biological Sciences with funding support from the Office for Research and Technology Transfer and from the Fairmount College of Liberal Arts and Sciences. **Dr. David Kovar**, from the University of Chicago, presented a talk entitled "Investigating the Actin Cytoskeleton with Complementary in Vitro and in Vivo Approaches."
Kansas Science Olympiad

Each year, the State of Kansas Science Olympiad is held at Wichita State University. Teams of high-school students who won local tournaments across the state compete for the right to advance to the national Science Olympiad. The 2013 state tournament was held on April 5th, with most of the events located in McKinley Hall. Many members of the Wichita State chemistry department gave up their Saturday to help out with this event, including staff members, faculty members, graduate students, and undergraduate students. Volunteers included Jim Bann, Susan McCoy, Mary Cambridge, Sarah Jack, Fatemeh Chadeegani, Sumudu Mapa, Ashley Young, Cody Herrin, Isaac Dennis, Thanh Dinh, Kat Sherman, Sireesha Mamillapali, Krishna Mohan, Jeffrey Berry, Matthew Baird, Sheila Brown, Machaela Garrett, Devonte Garcia, Julia Kaszycki, Jayangika Dahanayake, Siva Mandadapu, Pathum Weerawarna, Anushka Chathuranga, Nilmini Senaratne, and Chamila Kadigamuwa.

Expanding Your Horizons Workshop

After last year’s resounding success, the Expanding Your Horizons (EYH) workshop was held again at WSU on November 8th. Moriah Beck reprised her role as workshop organizer for this half-day extravaganza of hands-on events intended to expose middle-school-aged girls to opportunities in science, math, and engineering. The number of participants was increased to 150 girls (up from last year’s 100). The presenters included student groups from the departments of chemistry and physics and from the College of Engineering, as well as faculty members from various WSU departments and professionals from outside the university. The keynote speaker was Dr. Sheryl Tucker, Professor of Chemistry and Dean of the Graduate School at Oklahoma State University and past winner of a Presidential Award for Excellence in Science, Mathematics and Engineering Mentoring. Chemistry department volunteers who participated in the event included Becki Taylor, Sarah Jack, Matt Baird, Ben Reed, Hitesh Rathod, Joe Karnes, Dylan Montgomery, and Meghan Schuetz.

Chemistry Professors teach at the University of Kansas School of Medicine

The University of Kansas School of Medicine has maintained a campus at 9th and Kansas in Wichita (KUSM-W) since 1971. For most of its existence, this campus was limited to providing students with their final two years of study – all students completed their classroom education at the University of Kansas Medical Center in Kansas City (KUMC) and then transferred to Wichita for their clinical rotations. Beginning in 2011, the program at the Wichita campus was expanded to a full four-year medical school, with an initial class of eight students (including a few WSU chemistry graduates). Enrollment has steadily increased, with a total enrollment in July, 2014, of 196 medical students. Currently, the teaching model for the first two years involves classes taught via distance-learning technology by faculty at KUMC. Students at both campuses then participate in small-group sessions held at their own campus. Many of these sessions at KUSM-W are led by faculty members from Wichita State, including a number of faculty members from the Department of Biological Sciences. Two faculty members from the Department of Chemistry have participated in this function – Bill Groutas previously led small group sessions on COPD and Jim Bann continues to lead small group sessions on Sickle-cell disease and Huntington disease. In addition, Dr. Bann holds regular “office hours” at KUSM-W to assist students with their biochemistry classes. As the Wichita campus continues to grow and hire faculty, the involvement of WSU faculty members will certainly evolve, but we hope to continue to interact and collaborate with KUSM-W in both teaching and research.
Chemistry Student wins inaugural Sarachek award

The Rosalee and Alvin Sarachek Award for Scholarly Excellence in the Natural Sciences has been established by Dr. Alvin Sarachek, WSU Emeritus Professor in Biological Sciences, and his wife, Rosalee, to recognize one graduating senior in biology, chemistry, geology, or physics. Emily Lancaster, who graduated Summa cum Laude with a BS in Chemistry-Premedicine in May, was the first recipient of this award. During her four years at WSU, Emily served as a Supplemental Instructor for classes in Biology and Chemistry and as an SI Senior Leader. She engaged in research with the WSU Center for Community Support and Research and with Dr. Eichhorn in the WSU Department of Chemistry, where she studied the preparation of iron compounds relevant to biological systems. Emily presented her research results at the WSU Undergraduate Research and Creative Activities Forum in May and is currently attending the University of Kansas School of Medicine. Emily received the Sarachek award at the WSU Commencement ceremony and was also recognized at the Chemistry awards ceremony. Congratulations, Emily!

Undergraduate Chemistry Awards Ceremony

The fifth annual chemistry awards ceremony was held on May 2, 2014, hosted by Dr. Doug English.

The following awards were presented:
American Chemical Society Wichita Section Awards (these awards were officially presented at the meeting of the Wichita Section of the ACS): Outstanding Freshman Chemistry Major: Elvin Salerno Outstanding Graduating Senior: George Elkouri (picture below)

Merck Index Award: Carmen Gott
ACS Award in Analytical Chemistry: Quang Va
ACS Award in Inorganic Chemistry: Jon Ellis
ACS Award in Organic Chemistry: Chris Thacker
CRC Press Chemistry Achievement Award: Amer Alsoudi

The following students were also recognized for achievements:
Emily Lancaster - Rosalie and Alvin Sarachek Award for Scholarly Excellence in the Natural Sciences
Stan Saiz – McNair Research Scholar and KINBRE STAR Trainee, working with Dr. Beck

KINBRE Research Scholars:
Chris Thacker (doing research with Dr. Burns)
Michael Stoller (Dr. Gong)
George Elkouri (Dr. Beck)
Afiqah Ayauf (Dr. Mitchell-Koch)

Congratulations to all these students!

Recent Departmental Publications

19F nuclear magnetic resonance and crystallographic studies of 5-Fluorotryptophan-labeled anthrax protective antigen and effects of the receptor on stability; Chadegani, F.; Lovell, Sc.; Mulangi, V.; Miyagi, M.; Battaille, K. P.; Bann, J. G.; Biochemistry (2014), 53(4), 690-701.


Gene Zaid gives Fairmount College commencement address

The Spring 2014 commencement ceremonies for the Fairmount College of Liberal Arts and Sciences were held in Koch Arena on May 16th, 2014. The keynote speaker for this year was Dr. Gene Zaid, president of JACAM Chemicals in Sterling, KS, and former graduate student in the WSU Department of Chemistry (MS, Buess, 1977). Also, this year, Dr. Zaid became a member of both the Fairmount College Advisory Council, which works with the Dean of Fairmount College to address the relationship between the College and the broader community, and the WSU National Advisory Council, a body of accomplished individuals, mostly WSU alumni, who advise the WSU Foundation and work to promote the interests of Wichita State. Congratulations to Dr. Zaid and many thanks to him for giving his time to assist the college and university.

Address Changes

If this issue of ShockerChem is not being delivered to the correct address, please send an email to chemistry@wichita.edu to give us your correct address!
WSU Chemists’ Travels

In addition to publishing papers, it is important for members of the WSU chemistry department to travel outside of the confines of the WSU campus to talk to other audiences about their research. Obviously, we routinely send a large delegation of students and faculty to the annual Midwest Regional meeting of the American Chemical Society, on which we have reported in this and other issues of Shockchem. Below are some of the other recent presentations by members of the department.

Bann group:
- Fatemeh Chadegani, “19F-NMR studies indicate long-range increase in stability of the anthrax protective antigen when bound to the host receptor CMG2,” Protein Society Meeting, Boston, MA, July 20 – 23, 2013

Beck group:
- Ritu Gurung, “A Study Of The Actin Binding Protein, Palladin, And Its Possible Role In Cancer Metastasis,” IDeA Conference, Kansas City, MO May 20-22, 2013
- Moriah Beck “Structural mechanism for control of actin polymerization and organization by palladin” Southwest Regional ACS meeting, Waco, TX Nov. 17-19, 2013
- Stan Saiz and Ty Dille, “Palladin’s Ig4 Mutation: Exploring the Link with Pancreatic Cancer”, K-INBRE Symposium, Kansas City, MO, Jan. 18, 2014
- Jon Ellis and Upasana Banerjee,”Exploring the Role of Myopalladin in Cardiac Muscle Development”, K-INBRE Symposium, Kansas City, MO, Jan. 18, 2014
- Rahul Yadav, “Regulation of palladin by membrane phospholipid P(4,5)P₂,” Oklahoma COBRE Structural Biology Symposium, Oklahoma University, Norman, OK, June 9, 2014
- Ravi Vattepu, “Actin induces dimerization in palladin actin binding domain,” Oklahoma COBRE Structural Biology Symposium, Oklahoma University, Norman, OK, June 9, 2014
- Moriah Beck “Structural mechanism for control of actin polymerization and organization by palladin” International Conference on Magnetic Resonance in Biological Systems (ICMRBS), Dallas, TX, August 26-29, 2014
- Moriah Beck, “Regulation of palladin structure and function.” COBRE External Advisory Committee Annual Meeting and Symposium, University of Kansas, Lawrence, KS Sept. 11-12, 2014

Eichhorn group:
- David Eichhorn, “Coordination Chemistry Inspired by Metalloenzyme Active Sites,” Georgetown University, March 19, 2013

English group:
- Doug English, “Fluorescence-based single molecule studies of biological and bio-inspired systems,” Kansas State University, Manhattan, KS, Apr. 2013
- Archana Mishra, “Micelle-mediated in situ generation of bromine: a green approach to bromination and selective oxidation in water,” Kansas Physical Chemistry Symposium, University of Kansas, Lawrence, KS, Nov. 2013

continued on next page
WSU Chemists’ Travels

Gong group:

Groutas group:

Mitchell-Koch group:
- Chandana Kasireddy, “Computational Studies of the N1-H and N3-H tautomers of 2-Fluoro and 4-Fluorohistidine,” Kansas Physical Chemistry Symposium, Nov. 2013
- Rajni Verma, “Insight into the broad substrate promiscuity of E. coli alcohol dehydrogenase,” 247th National American Chemical Society, Dallas, TX, March 2014
- Katie Mitchell-Koch, “Simulations of substrate-enzyme interactions toward rational bioengineering for biofuel production,” Pittsburg State University, April 2014
- Katie Mitchell-Koch "Conformational dynamics of E. coli YqhD oxidoreductase in the presence of substrates" 248th National American Chemical Society, San Francisco, August 2014
- Katie Mitchell-Koch, "Characterizing enzyme-substrate interactions of the E. coli oxidoreductase YqhD using molecular dynamics simulations," Southwest Regional Meeting of the American Chemical Society, Nov. 2014
- Katie Mitchell-Koch, "Molecular dynamics studies of substrate and solvent interactions with enzymes," University of Kansas, DyMeRs Colloquium, December 2014

Rillema group:

Shvartsburg group:
- Alexandre Shvartsburg, “Multireflection time-of-flight mass spectrometer with ion funnel front end for ultimate sensitivity and resolving power,” 248th National Meeting of the American Chemical Society, San Francisco, CA, Aug. 10 - 14, 2014
- Alexandre Shvartsburg, “Differential IMS (FAIMS): fundamentals and analytical platforms, ASMS Fall Workshop on Ion Mobility Spectrometry, Seattle, WA, Nov. 6 - 7, 2014
- Alexandre Shvartsburg, “Localizing post-translational modifications and sequence inversions," ASMS Fall Workshop on Ion Mobility Spectrometry, Seattle, WA, Nov. 6 - 7, 2014
Undergraduate Degrees

**Fall 2013**
- Zahraa Jafar Al Ali: Field Major-Chemistry
- Dennis Allan Aylward: General Studies-Chemistry
- Matthew Logan Blick: General Studies-Chemistry
- Collin Thomas Clay: Chemistry Pre-Medicine
- Cavon Edwin Cockrum: Chemistry-Business
- Anthony Marcus Edwards: General Studies-Chemistry
- Chibuzo Chika Ejike: Chemistry
- Tyson Huynh: Chemistry BS
- Derek William Means: General Studies-Chemistry
- Koichiro Saeki: Chemistry-Business
- Jordan Lee Smith: Field Major-Chemistry
- Laura Susan Velazquez: General Studies-Chemistry
- Patricia M Webster: General Studies-Chemistry

**Spring 2014**
- Matthew Derik Albert: General Studies-Chemistry
- Mackenzie Rae Allen: Chemistry Pre-Medicine
- Afiqah Binti Ayauf: Chemistry BS
- Katelin Renee' Beeson: General Studies-Chemistry
- Danielle N Bryant: General Studies-Chemistry
- Lindsay Ann Dickmeyer: Field Major-Chemistry
- George Ed Elkouri II: Chemistry BS
- Jonathan Michael Ellis: ACS Biochemistry
- Elizabeth Janet Field: Chemistry BA
- Carmen Louise Gott: Chemistry BS

Graduate Degrees

**Fall 2013**
- Aruna Jayasinghe (PhD, Burns)

**Spring 2014**
- Sivakoteswara Mandadapu (PhD, Groutas)
- Devaki Gautam (MS, Mitchell-Koch)
- Alexander Williams (PhD, Bann)

**Summer 2014**
- Amanda Alliband (PhD, Burns)
- Fatemeh Chadegani (PhD, Groutas)
- Adi Uy (MS, Groutas)

ACS Student Affiliates wins Award

For the second time in three years, the American Chemical Society Student Affiliates chapter at WSU has received an Honorable Mention Award for its activities conducted during the 2013 – 2014 academic year. This award was based on a report submitted to the ACS Committee on Education. Of over 400 reports submitted to the committee, 44 outstanding, 85 commendable, and 151 honorable mention awards were presented. Among other activities that the Student Affiliates participated in this past year were: an outdoor science demonstration (picture at right) which was organized jointly with the Physics Students Society, volunteering at the Kansas Science Olympiad and the Expanding Your Horizons events (including designing and running one of the workshops), selling goggles to students in the undergraduate chemistry labs, and touring the JACAM Chemicals facilities in Sterling, KS. Officers for the 2014-2015 academic year are:

Rebecca Taylor, President; Matt Baird, Vice-President; Hanie Baayoun, treasurer, Sarah Jack, secretary.