

**Special points of interest:**

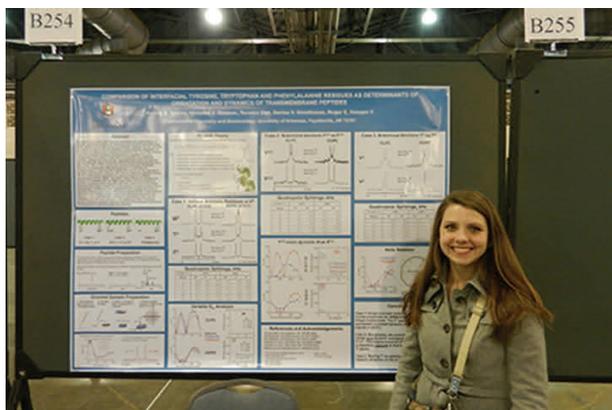
- Undergraduate alumnae work published in *Biochemistry*
- Cordes' PhD mentor thanked
- Two students pass Cume exams
- INBRE speakers highlighted
- Mole moves to bi-monthly publication schedule

**Inside this issue:**

Faculty News	2
Student News	3
Alumni News	3
Calendar	4
Library Hours	4
CUME Dates posted	4

## Alumna Kelsey Sparks Presents Research

FAYETTEVILLE, Ark. – A University of Arkansas research team shed new light on the molecular properties that drive the nervous system. Their work was recently published in *Biochemistry*, one of the top journals in the field. **Kelsey Sparks**, an alumna of the J. William Fulbright College of Arts and Sciences and the Honors College, who is currently pursuing a medical degree at the University of Arkansas for Medical Sciences, led the research effort as an undergraduate, working for three years on what became her capstone honors thesis.



Sparks is the first author on the article, giving her primary credit for the discoveries. Other undergraduate coauthors were Fulbright and Honors College alumna and Sturgis Fellow **Rebekah Langston**, who currently holds a research position at the National Institutes of Health, and Renatra Gist, an alumna of Tennessee State University who completed a summer National Science Foundation-sponsored Research Experience for Undergraduates at the U of A.

The paper, “Comparisons of Interfacial Phe, Tyr, and Trp Residues as Determinants of Orientation and Dynamics for GWALP Transmembrane Peptides,” was featured on the front of *Biochemistry*'s website, an unprecedented honor for undergraduate work, according to honors faculty mentor **Roger Koeppe**, Distinguished Professor of chemistry.

“It was a nice surprise when Dr. Koeppe emailed me,” Sparks said. “It’s an honor to have our research published in *Biochemistry*.”

Using nuclear magnetic resonance spectroscopy, the U of A team altered the amino acid sequences of model peptides and incorporated deuterium labels to study how they move within a model for the outer membrane of a cell.

“It’s like doing an MRI on a molecule,” Koeppe said.

Several of their findings were surprising: for example, some of the amino acids that could form hydrogen bonds with membrane lipids caused their host helices to move faster than their non-hydrogen bonding counterparts.

“You would think that hydrogen bonds would slow things down, since water is slower than gas,” Koeppe said. The team also discovered that peptide rotations are sensitive to changes in the thickness of membranes. The paper contributes to knowledge of the molecular properties that allow the nervous system to work, and ultimately could contribute to the understanding and treatment of neurological diseases such as Alzheimer’s or Parkinson’s.

“We’re working at the first level – the physics of it,” Koeppe cautioned. “We’re not developing medical products, but we’re trying to improve the basic understanding. The remarkable thing is that these undergraduate students were making discoveries in such a complex area. They’re at the forefront in this field.”

The Honors College supported Sparks’ work with a research and travel grant. Other members of the research team who are coauthors on the article are **Nicholas J. Gleason, Denise V. Greathouse** and Koeppe.

Research on the molecular frontier of membrane biophysics continues in Koeppe’s lab, where five Honors College students are currently exploring additional questions related to the research published in *Biochemistry*.

## Faculty News

### On the Go

**Joshua Sakon** presented "Clostridial collagen-binders that target remodeling collagen" at the 22nd Annual Meeting of the South Central Branch of the American Society for Microbiology in Fayetteville, AR, Sept. 11-13, 2014. Other authors of the work are **Dawn Weir, Jes Sanders, Kate Janowska, Ryan Bauer, and Leena Philominathan**. Also presented at the same meeting was "Metabolic flux analysis to describe fed batch production of therapeutics." It is authored by Robert Beitle and **Joshua Sakon**.

### Publications

**Jayanthi S. B. Koppolu, S. Smith, R. Jalah, J. Bear, M. Rosati, G.N. Pavalakis,**

**B.K. Felber, D.A. Zaharoff, T.K.S. Kumar.** (2014) Efficient production and purification of recombinant human interleukin-12 overexpressed in mammalian cells without affinity tag. *Protein Expression and Purification*, 102, 76-84.

**Jayanthi, S., K.M. Kathir, D. Rajalingam, A. Daily, R. Thurman, L. Rutherford, P.D. Adams, I. Prudovsky, T.K.S. Kumar.** (2013) Copper binding affinity of the C2B domain of synaptotagmin-I and its potential role in the non-classical secretion of Acidic Fibroblast Growth Factor. *Biochim. Biophys. Acta.*, doi:10.1016/j.bbapap.2014.09.008.

**Koppolu, B.R., S. Smith, S. Ravindranathan, S. Jayanthi, T.K.S. Kumar, D. Zaharoff.** (2014) Controlling chitosan-based encapsulation for protein and vaccine delivery. *Biomaterials*, 35, 4382-4389.

**Beckford, S, J. Cai, J. Chen, M. Zou.** Use of Au Nanoparticle-Filled PTFE Films to Produce Low-Friction and Low-Wear Surface Coatings. *Tribology Lett.* 2014, in press.

**Theresa H. Nguyen, Scott A. Morris, Nan Zheng.** Intermolecular [3+2] Annulation of Cyclopropylanilines with Alkynes, Enynes, and Diynes via Visible Light Photocatalysis. *Adv. Synt. Catal.* 2014, 356, 2831-37.

### Recognition

Japanese Patent Office issued Patent No. 5520811, entitled "Delivery of Therapeutic Agents by a Collagen Binding Protein," to the Board of Trustees of the University of Arkansas (U.S.), by **Joshua Sakon**.

## From the Chair

Recently the Department received a generous gift from Dr. Theodore Brown in honor of Wally Cordes, who was Dr. Brown's first Ph.D. student at the University of Illinois. Dr. Brown just learned of Dr. Cordes' passing and immediately sent a donation in his memory. Appropriately, in his accompanying letter, Dr. Brown shared some memories of how Wally Cordes came to the University of Arkansas and some connections with two other former Chemistry faculty members. I'll let Professor Brown tell the story.

When I was an undergraduate at Illinois Institute of Technology during the period 1946-1950, I took a course in advanced organic chemistry taught by Sam Siegel. I recall it as one of the most inspiring experiences of my undergraduate career, one that motivated me not only to want to have a career in chemistry, but to be a teacher. Sam moved on to Arkansas, and when Wally was looking for a teaching position, my friendship with Sam helped to some degree, I'm sure, in their decision to hire Wally. I visited the department a few times over the years, and enjoyed seeing Wally's success as well as renewing my friendship with Sam. (By the way, Dale Johnson was an undergraduate student at Illinois and did his senior thesis under my direction. It was a very nice piece of research.)

Wally, Sam and Dale all tangled up together before they got here; who knew? And I thought Illinois was a big state. (This is the part of the program where we pause and sing "It's a Small World (after all).")

And now that I have that song stuck in your head, let me quote one more line from Dr. Brown. "It was pretty clear that Wally was a gifted teacher based on his graduate student teaching performance, and he lived up to that early promise during his career at Arkansas." That may be the understatement of the year. Dr. Cordes' passion for and excellence at teaching are part of the proud history of the department and it is entirely appropriate that excellence in teaching by our graduate students is recognized by awards in Dr. Cordes' name, with the prize money coming from the income of the Cordes endowment established by Dr. Brown and many other benefactors. Let me publicly thank Dr. Brown not only for his gift, but for sharing some history with us.

If your life was touched by Dr. Cordes, some other faculty member, or just by the Chemistry and Biochemistry department in general, please consider how you can help us provide the very best educational opportunities to future generations of students. And, if you too have some great stories to share about the Department or its denizens, by all means, send those in. We would love to share recollections of alumni in future issues of the MOLE.

- Wesley Stites



Theodore L. Brown, Professor Emeritus of Chemistry at the University of Illinois, Urbana-Champaign, and Founding Director Emeritus of the Arnold and Mabel Beckman Institute.

## Student News



Yudai Nakamura is a third-year medical student from University of Okayama. He is working on bacterial histidine kinase receptor systems in **Sakon's** lab. He is pictured at Crystal Bridges Museum of American Art in Bentonville, AR.

## Passed 7th Cume Exam



**Lucas Whisenhunt** passed his 7th cume September 12 and has been admitted to candidacy. Lucas entered our program in the fall of 2012. He received his B.S. degree from Henderson State University in May of 2012. His advisor is **Wei Shi**.



**Nandita Halder** passed her 7th cume September 12. She received her B.Sc. Engg degree from Bangladesh University of Engineering and Technology, Dhaka in February of 2011, and entered our Ph.D. program in the spring of 2012. Her advisor is **David Paul**.

## Alumni News

**Susan Grisham Banerjee**, Ph.D. 2010, and her husband Dev announce the birth of their daughter Olivia Palomi Banerjee, born September 18, 2014. Susan's U of A advisor was Xiaogan Peng. She and Dev live in Irwin, PA.



## INBRE Conference Speakers



*Dr. Paul R. Selvin*

The 2014 Conference of the Arkansas IDeA Network of Biomedical Research Excellence (Arkansas INBRE) will take place November 7-8 in Fayetteville, on the Fayetteville square and the University of Arkansas campus. This year's keynote speaker will be Dr. Paul R. Selvin, professor, Department of Physics and Biophysics from the University of Illinois at Urbana-Champaign. He will be speaking on the topic "Your Body is Made of Trillions of Tiny Walking Molecular Motors" at the Fayetteville Town Center banquet Friday night, November 7.

Invited faculty talks will take place Friday afternoon at the Chancellor Hotel from 1:30-3:00 p.m. Representing the Biology division, Dr. Joel Funk will present "Sending the Wrong Signal: *Coxiella burneti* and the Protein Kinase C Signaling Pathway." Dr. Funk is an Assistant Professor in the Department of Biology at John Brown University in Siloam Springs, AR.



*Dr. Joel Funk*



*Dr. Andres A. Caro*

Speaking for the Chemistry Division will be Dr. Andres A. Caro. Dr. Caro is an Associate Professor in the Chemistry Department at Hendrix College, Conway, AR. His topic is "Oxidative Stress Upregulates Mitochondrial, Biogenesis Genes in Livers from Rats Fed Ethanol Chronically."

The Physics talk will be given by Dr. Joseph Herzog, who is a visiting Assistant Professor in the Physics Department at the University of Arkansas. His title is "Beyond the Diffraction Limit with Nano-Optics: Plasmonics and Photonic Crystals."



*Dr. Joseph Herzog*

Numerous workshops will be offered, as well as competitive undergraduate poster and oral platform sessions. The Arkansas IDeA Network of Biomedical Research Excellence is funded by a grant from the National Institute of General Medical Sciences (NIGMS), under the Institutional Development Award (IDeA) Program of the National Institutes of Health (NIH). The IDeA program was established for the purpose of broadening the geographic distribution of NIH funding for biomedical and behavioral research. The sites for Conference Registration and the Submission of Abstracts will remain open until the 3rd of October: <http://chemistry.uark.edu/INBRE/register.htm>

THE MOLE STREET JOURNAL IS AN  
INTERNAL PUBLICATION OF THE  
DEPARTMENT OF CHEMISTRY AND  
BIOCHEMISTRY  
CHAIR, WESLEY STITES  
LESLIE JOHNSON, EDITOR

Mailing Address  
CHEM 119  
University of Arkansas  
Fayetteville, AR 72701

Phone: 479-575-4601  
Fax: 479-575-4049  
E-mail: cheminfo@uark.edu

We're on the web!  
chemistry.uark.edu/4842.php  
&  
Department of Chemistry and  
Biochemistry \*University of  
Arkansas

## Safety Tip: by Bill Durham

Many laboratory accidents happen during cleaning of glassware. Not cleaning your glassware in a timely manner increases the risk of an accident.



Department of Chemistry  
and Biochemistry

## Excellence in the Central Science

The department of chemistry and biochemistry at the University of Arkansas strives for excellence in research, teaching and service in chemistry - the central science. We aspire to positions of leadership regarding the discovery of new scientific knowledge, the training of students, and the economic development of the State of Arkansas. We seek to recruit and retain a diverse group of the best faculty, students and staff to address the challenges of the future through interdisciplinary and multidisciplinary research and education.

**NOTICE:** The Mole is moving to a bi-monthly format. Our next publication will be at the first of December, and will cover news that happens during October and November. Please continue to submit news articles in a timely fashion each month.

Wesley Stites, Chair

## Calendar of Events

### October

- 01 Application deadline for students who plan to graduate at the end of Fall
- 06 Seminar, Kathryn M. Fichter, Missouri State Univ.
- 10 CUME - 5:30-6:30, CHEM 144
- 13 Seminar, Alexander Wei, Purdue University
- 20-21 Fall Break (Univ. offices are open)
- 27 Seminar, Joseph Ready, UT Southwestern Univ.

### November

- 03 Seminar, Shaowei Chen, Univ. of California-Santa Cruz
- 03 Priority Registration for currently enrolled students
- 10 Seminar, Justin Ragains, Louisiana State University
- 14 Cume
- 17 Seminar, Richard Briggs, Georgia State University
- 26 Thanksgiving Break (Student break, Univ. offices open)
- 27-28 Thanksgiving holiday (Univ. offices closed)

## Library Hours

CHBC Library (CHEM 225)  
<http://libinfo.uark.edu/chemistry>

### Fall Semester Hours: August 24-December 19

#### Regular Fall Hours

Saturday and Sunday	CLOSED
Monday – Thursday	8:00 am – 9:00 pm
Friday	8:00 am – 6:00 pm

#### Exceptions to Regular Fall Hours

Monday	Sept 1 (Labor Day)	CLOSED
Friday	Oct 17	8:00 am - 5:00 pm
Mon-Tues	Oct 20-21 (Fall Break)	8:00 am - 5:00 pm
Tues-Wed	Nov 25-26	8:00 am - 5:00 pm
Thurs-Fri	Nov 27-28 (Thanksgiving)	CLOSED
Friday	Dec 19	8:00 am - 5:00 pm
<b>Interim &amp; Winter Break: December 20-January 2</b>		
Saturday – Sunday	Dec 20-21	CLOSED
Monday – Tuesday	Dec 22-23	8:00 am – 5:00 pm
Wednesday – Friday	Dec 24-Jan 2	CLOSED

The chemistry and biochemistry library resources can be accessed in the following LibGuides: <http://uark.libguides.com/content.php?pid=110953>. Please bookmark for future use.

## CUME Dates Announced

### Fall CUME Dates:

October 10  
November 14  
December 5

5:30-6:30 p.m., CHEM 144

### Spring CUME Dates:

January 23  
February 13  
March 13  
April 3  
April 24

TIME & PLACE TBA



### Save the Date!

The 2014 INBRE conference will be held November 7-8 in Fayetteville, AR.

NOTICE - The department was recently given the okay to hire two new assistant professors for Fall, 2015. We are looking for a computational biophysicist and a materials chemist to join the faculty. If you know of any good candidates for these positions, please encourage them to apply.

