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University of Arkansas, Fayetteville. Dept. of Chemistry and Biochemistry

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“Developing Catalytic Nanogels as General Purpose Glycosidases” Receives NSF Funding of $485,000

Developing enzyme-like catalysts that can transform readily available and renewable resources into biofuels, fine chemicals, food additives, or pharmaceuticals is one of the grand challenges of the 21st century. A promising technology to achieve this goal is the transformation of compounds with biomimetic nanocatalysts that are operational in organic solution and in water.

In this NSF-funded project, Susanne Striegler and her team are developing a fundamental understanding of enzyme-like catalysts to elaborate the synergy between material properties and catalytic function of binuclear transition metal complexes. This basic research is likely to result in new technology to transform readily available feedstock, such as cellulose, into valuable synthons for various manufacturing processes.

The project will furthermore support the combined efforts of Dr. Striegler and Dr. Kathleen Condray, in the World Language Department at the UA, to invite middle and high school students from all over Arkansas, with their German teachers, to visit the Fayetteville campus in one-day workshops. Conducting fun chemical experiments while speaking German is anticipated to introduce the students to the opportunities of a combined language and STEM education at the University of Arkansas. The efforts are anticipated to result eventually in new projects that prepare and encourage undergraduate students to pursue a career in the sciences, studying abroad, and collaborating internationally with minimized language barriers.

Approximately 50 students participated in this year’s workshop. Dr. Striegler (far right) is pictured with some of the students.
Faculty News

On the Go

Joshua Sakon presented “Structure and function and preclinical applications of clostridial collagenases” at the Advances in Mineral Metabolism AIMM/ASBMR John Haddad Young Investigators’ Meeting, April 8-12, 2019, Snowmass, Colorado.

Joshua Sakon presented a talk, “Structure, function and applications of collagenase from Hathewaya histolytica” at the Advanced Membranes and Membrane Based Separation Processes Symposium in Fayetteville, AR May 15-16. The work is co-authored by Osamu Matsushita, Perry Caviness, and Cody Brazel.

Publications


Honors and Awards

Robert Coridan won this year’s Connor Faculty Fellowship. He received $5000 to support his research.

Feng Wang was awarded the 2019 Fullbright College Researcher award. He was recognized at the all college faculty meeting, and will receive a $500 annual salary increase.

Julie Stenken and Erica Westerman (BISC) got a STIR (Symposia to Trigger Interdisciplinary Research) award from the Office of the Vice Chancellor for Research and Innovation to sponsor a symposium. This will be the first STIR event sponsored by the VCRI. The title of their submission was “Integrative Systems Neuroscience.”

Each year the Office of Nationally Competitive Awards selects five or six faculty members who consistently (and often successfully) support students through the application process for state and national scholarships, for competitive research grants, or for other forms of recognition. Julie Stenken was presented with the office’s Faculty Gold Medal. The Provost presented this medal on Monday, April 22, at 3:00 p.m. (in the Jim and Joyce Faulkner Performing Arts Center) at the annual state and national awards reception. Not only was she a faculty mentor, but she received the highest award.

There was an Annual Invention Recognition ceremony April 23 for faculty filing a disclosure or getting a patent in the last year. Ingrid Fritsch and Matt Gerner were recognized for their patents in 2018. Those filing a disclosure were M. Hassan Beyzavi, Jingyi Chen, Stefan Kilyanek, Susanne Striegler, Suresh Kumar Thallapuranam, and Ryan Tian. The Chemistry and Biochemistry department accounted for about 20% of 2018 inventions (outside the weird beast that is Agriculture). We still are not 20% of the university. Ross Devol, President & CEO, Heartland Forward Fellow, was the keynote speaker. Awards were presented by Chancellor Joseph Steinmetz.
From the Chair ~ Wesley Stites

Our longest serving staff member, Janice Chapman, has retired. When I saw her at her grandchild’s high school band event a few days after her last day here, she did not seem at all sad or depressed! While we are glad that Janice will be able to enjoy her well-deserved retirement, it highlights some significant challenges we are facing.

We often think of a University as a machine for producing graduates and new knowledge and focus on the students and the faculty. When the machine is running smoothly, for most of the students and even much of the faculty, the staff fades out of notice, a constant background hum not drawing attention. As the Department Chair has to deal with many administrative issues, I am reminded constantly of how important our staff are, accomplishing all manner of vital tasks that the students and faculty are not aware exist, even as they register for classes that appear without human intervention in the schedule or magically get paid.

But right now I am reminded even more of the importance of our department staff and both faculty and students are becoming aware of that importance as well. Unfortunately, that is because things are not always running smoothly. This, to be crystal clear, is not the fault of our staff. We have had a tremendous turnover in the departmental office in the last few months. Regular readers may be aware of some of this, but, to recap, Heidi Thompson was promoted to the WorkDay implementation team. Tim Tripp moved over from his previous role as the main office administrator to fill Heidi’s accounting role. Geri Cruz moved from the Admin II reception position into the main office administrator slot and we brought Khusbu Chaudhary into the vacant Admin II position. Janice’s retirement I already mentioned and we are currently working to fill that position. And all this comes on top of other turnover in these critical staff positions in the past few years because of retirement (Judy and Mona) or transfers to better paying positions elsewhere in the University (Heather, LaToya, and Jae). Right now, two thirds of our office staff, if not outright new, are new to their roles. A lot of institutional knowledge has gone out the door and we are constantly playing catch-up. There isn’t a manual or guide on how to do many essential administrative functions; you just have to figure it out by asking lots of questions and trying. The administrative version of research, in a way. Over this same time period, some staff have been out with unavoidable family or health issues, putting more stress on the system.

While it certainly has been difficult at times (this week, RazorBuy and the summer workload spring to mind), we haven’t had a catastrophic failure. Ultimately, that lack-of-catastrophe is a testimony to our staff, both the old, new and ‘new’, working hard under trying circumstances. So, kudos to all our overworked and underpaid staff, past, present and future, office and scientific, for their dedication to keeping the machine running. We appreciate everything you do, even, perhaps especially, the things we don’t know about.

Alumni News

Dr. Charles Henry received the Advances in Measurement Science Lectureship Award from the ACS Division of Analytical Chemistry at Pittcon 2019. Chuck received his PhD in 1998 from the UA and his mentor was Ingrid Fritsch.

Brayley Gattis (BS 2019) is continuing her education at Northwestern University, pursuing a Ph.D. in chemistry. She received the NSF Graduate Research Fellowship. Kathleen McClanahan (BS 2019) and current graduate student Justin Reed both received honorable mention for the NSF GRFP. Out of the six NSF GRFP recipients at the U of A this year (3 winners and 3 honorable mention), half were from our department. Gattis has researched with Jingyi Chen, Associate Professor of chemistry. In addition to her on-campus research, Gattis has participated in an NSF research experience for undergraduates at the University of Iowa, and completed an internship at the University of Paul Sabatier in Toulouse, France.

“I am very grateful to have received this fellowship before I start my graduate studies,” said Gattis. “As I begin my chemistry doctorate, being self-funded will likely allow me to join whichever lab that I want to perform the research that I find most interesting. My research goal is to combine chemotherapy and immunotherapy while using nanoparticles as drug-delivery devices to selectively target cancerous cells.” Gattis will use her NSF funding to pursue a doctorate at Northwestern University.

“Brayley Gattis is simply an amazing student,” said Chen. “Building on her solid background in chemistry, she is passionate about chemical research. After she was introduced to nanoscience and nanotechnology, she spent most of her spare time in the lab carrying out experiments to solve biomedical-related problems. She has also found every possible opportunity to broaden her research experience through summer undergraduate research programs in the U.S. and around the world. I believe Brayley will continue to do great work and make us proud.”
Department’s Annual Canoe Trip

Colin Heyes led the annual Chemistry Canoe trip on the Buffalo River this past Monday, May 13, 2019. This annual Chemistry Canoe trip has been taking place for more than 60 years, and was led starting in the 1950s by faculty members Art Fry, Wally Cordes, and George Blyholder. These chemistry faculty were founding members of the Ozark Society, which fought to preserve the Buffalo River from being dammed, and led to the establishment of the Buffalo National River, a part of the National Park System, by an act of congress in 1972.

Our canoe trip on Monday, May 13 from Ponca Low Water Bridge to Kyles Landing, 10.3 miles, included the most iconic sites on the upper Buffalo River. We started at Ponca Low Water Bridge and then passed Bee Bluff down to Roark Bluff, where we had lunch. After lunch we canoed down to Big Bluff, and saw the famous Goat Trail which cuts across Big Bluff about half way up. We then stopped to enjoy the scenery at Jim Bluff. The next stop was a hike up to Hemmed-in-Hollow, which has the highest waterfall, 210 feet, between the Appalachians and the Rocky Mountains. We then encountered the biggest rapids on the Buffalo River, including Hell’s Half Acre, and the infamous Grey Rock. The water level was perfect, and we had an exciting ride through Hell’s Half Acre. The weather was perfect, clear and 75 degrees. We all survived!

Sakon Takes the Prize in the AIMM Ski Race

Joshua Sakon took home the prize this year for the AIMM ski race. He is pictured above, second from left, with his plaque, and below left as he courses down the mountain.

Skiing is only one of the benefits of attending this meeting in Snowmass, CO.

In the spring of 1986, the first Advances in Mineral Metabolism meeting occurred. This came from a small group wanting to combine state-of-the-art science, meaningful interactions, small group discussions, and young investigators away from the hurly-burly of the ASBMR, with great spring skiing.

As stated in their published mission in 1986, AIMM is a nonprofit organization whose purpose is to bring together the most active basic and clinical researchers in the field of mineral metabolism and to provide an environment that is conducive to open discussion and spirited debate.

From these early beginnings, AIMM has been the place to present ideas, engage and develop scientific collaborations, and foster friendships that last a lifetime...and ski.

This year, Dr. Sakon presented, “Structure and function and preclinical applications of clostridial collagenases.”

Retirement (Joyfully) Announced

Janice Chapman, Administrative Specialist II, retired April 30, 2019 after 39 years with the department. She began her work with the department in March, 1980, when Leslie Sims was chair. She worked under him, Dale Johnson, Wally Cordes, Collis Geren, Roger Koepppe, Dan Davis, Don Bobbitt, Bill Durham, Bob Gawley, and Wes Stites during her tenure. She said the biggest change she witnessed was the coming of computers and the internet. She began as a clerical staff person, typing exams, papers, correspondence, and reports. That evolved into becoming the travel and purchasing agent. When asked for parting thoughts, she said in her best Arnold Schwarzenegger voice, “I won’t be back.” We wish her well on this new phase in her life. She will be missed.

Proud Grandpa

Professor Emeritus Bill Durham dropped by the department recently with grandson Isaac Durham.
Students in the News

Anh Nguyen presented a poster at the MRS Spring Meeting and Exhibition at Phoenix, Arizona (April 22-26) entitled “Effect of Zn Precursor Concentration on the Blinking Behavior of CuInS$_2$/ZnS Quantum Dots and Characterization of Fast Blinking Particles for Super-Resolution Imaging.” The work is co-authored by his advisor, Dr. Colin Heyes.

STUDENTS PASS CUMES
Joseph Duffield and John Ozdemir both had the honor of passing their last cume exam. Joe started his PhD program in the fall of 2017. He received his BS from the University of the Sciences in Philadelphia, PA. John entered the program in the spring of 2018, receiving his BS from the U of A. Both are organic students and members of the Beyzavi lab.

Hirotaka Kajikawa is a third-year medical student from Okayama University in Japan. Due to his father’s job, he relocated many times, attending schools in Thailand, Belgium, Singapore, and Japan. He will be working in Joshua Sakon’s lab towards solving structures of several proteins he isolated at Okayama. Agreement of cooperation between the University of Arkansas and Okayama University was established in 2018.

From the Ryan Tian lab:
- Caleb Heath (a co-advisee with Micro-EP) defended his MS thesis on April 18.
- Asya Ozkizilcik defended her PhD thesis in BMEG on April 12. She published with Dr. Tian 7 peer-reviewed papers, 7 book chapters, and 18 conference-proceeding papers during her time at the UA.
- John Winkelman, a Micro-EP grad student working between Drs. Tian and Xiao labs, posthumously received a nonthesis MS degree in MicroEP. He passed away March 19, 2019. His father, Bob Winkelman, was regarded internationally as “Mr. Diehard Battery” for honoring his invention of the battery that Sears, Roebuck & Co. sold. Bob’s father or grandfather was one in the group who won the bidding in Little Rock for locating the University of Arkansas campus in Fayetteville.

Isabelle Niyonshuti presented a poster at the ACS spring 2019 meeting in Orlando, Florida entitled “Investigation of the Effects on Stability of Silver Nanoparticles.” It was co-authored by her advisor, Jingyi Chen, and Meaad Alqahtany and Dr. Yong Wang from the Physics Department.
Honors and Commencement

Friday, May 10 and Saturday, May 11 were days filled with expectations and excitement as undergraduates and graduate students participated in commencement ceremonies.

The J. William Fulbright College of Arts and Sciences held their ceremony in Bud Walton Arena at 3:00 p.m. May 10. The official graduate list has not yet been released.

The Fulbright College Honors Program was also held on Friday, in the Arkansas Union Ballroom. Honors students are classified as either College Scholars or Departmental Scholars. College Scholars are asked to take most of their core courses at the honors level (including upper-level colloquia), meet all departmental requirements, and write and defend an honors thesis. Departmental Scholars students must complete honors courses, satisfy all departmental requirements, and write and defend an honors thesis.

College Scholars, Chemistry

Alvaro Aldana
Anthony Azzun
Dhrubh Dasgupta
Chynna Denham
Devin Dupree
Nimit Gandhi
Brayley Gattis
Larry Hill
Victoria Hoggard
Alexis Jacobus
Scott Lirig
Alexandra Otwell
Stephanie Oyibo
Casey Patrick
Julia Scott
Mounika Seeram
Sara Sustich
Manasa Veluvolu
James Webb

Cum Laude
Summa Cum Laude
Summa Cum Laude
T.B.D.
Summa Cum Laude
Summa Cum Laude
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Paul Adams, mentor
M. Hassan Beyzavi, mentor
Jingyi Chen, mentor
T.K.S. Kumar, mentor
T.K.S. Kumar, mentor
Paul Adams, mentor
Jingyi Chen, mentor
David Miller, mentor
Matt Mchntosh, mentor
Paul Adams, mentor
T.K.S. Kumar, mentor
Robert Elbin, mentor
Jingyi Chen, mentor
T.K.S. Kumar, mentor
Susanne Striegl, mentor
Kartik Balschandran, mentor
Roger Koepe, mentor
Jeffrey Lewis, mentor
M. Hassan Beyzavi, mentor

Departmental Scholars, Chemistry

Emma Buckner
Maria Dunn
Kathleen McClanahan
Chandler Merriman
Robin Rayle
Curlin Ray
Aaron Seeler
Zaheer Siddiqui
Samuel Stoliker
Alleigh Stahman
Elonay Yehualashet

Summa Cum Laude
Magn Cum Laude
Magn Cum Laude
Magn Cum Laude
Magn Cum Laude
Magn Cum Laude
Magn Cum Laude
Magn Cum Laude
Magn Cum Laude
Magn Cum Laude
Magn Cum Laude

David McNabb, mentor
T.K.S. Kumar, mentor
T.K.S. Kumar, mentor
T.K.S. Kumar, mentor
Kyle Quinn, mentor
T.K.S. Kumar, mentor
Michelle Gray, mentor
Jingyi Chen, mentor
Wesley Sites, mentor
Chenguang Fan, mentor
Mahmoud Moradi, mentor

Many of the students listed here presented their honors research in a poster format during the Honors and Majors Day hosted by the department. The event was held April 22, 2019, with a department awards/recognition program following the poster session.

More than $121,000 in scholarships were awarded this year to deserving current students and incoming freshmen for the fall of 2019.


Eight incoming freshmen received the Jacob Sacks Chemistry Award. They are Madyson Arnel, Blaire Baxter, DaQuanda Clayton, Jackson P. Copeland, Ali Hamza, Emmanuel Hervey, Summer Matlock, and Aniya Showers.

Receiving the Samuel and Betty Siegel Scholarship was incoming freshman Jacob Shrum.
Excellence in the Central Science

Calendar of Events

June
4 National Cheese Day
6 D Day
8 Belmont Stakes
14 Flag Day
16 Father’s Day
17 National Eat Your Vegetables Day
21 First official day of summer

July
4 Independence Day Holiday. Offices closed, no classes
12 Drop with “W” Deadline: Summer ten week courses
13 National French Fries Day
24 REU “Meeting in Miniature” Poster session
26 REU program concludes

Safety Tip:
By Chris Mazzanti

Even though it is summer, remember to protect yourself from spills. Wear closed toe shoes and lab coats in the lab.

Library Hours

Regular Summer Hours: May 28 - August 3
Saturday - Sunday CLOSED
Monday – Thursday 8:00am – 6:00pm
Friday 8:00am – 5:00pm

Exceptions to Regular Summer Hours
Wednesday July 3 8:00am - 5:00pm
Thursday July 4 CLOSED

Intersession & Interim Hours: August 4 - 24
Saturday - Sunday CLOSED
Monday - Friday 8:00am - 5:00pm

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. Theses and dissertation resources can be found on the following LibGuide: http://uark.libguides.com/content.php?pid=123035 &sid=1057466. For more information: Check the Libraries’ web site (http://libinfo.uark.edu) for updated information on hours and services. Library hours are also available by dialing 479-575-2557.

Our department web page is located at chemistry.uark.edu. There you will find links to departmental information, news, and people. But best of all, alumni can stay in touch through the Alumni & Friends link. We want our alumni to stay in touch! Please take a few minutes to browse the page and submit any update you’d like published (or not). We welcome pictures, too!