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Arkansas Catalyst, August 2013

University of Arkansas, Fayetteville

UNIVERSITY OF ARKANSAS
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The Arkansas Catalyst

August 2013

University Sets Record for Invention Disclosures

Solutions in the laboratory at Boston Mountain Biotech, a University of Arkansas-affiliated company that spun out of an invention disclosure.

The University of Arkansas closed the last fiscal year with a record number of intellectual property disclosures reported by campus researchers.

Faculty and staff at the state's flagship university reported 42 inventions in fiscal year 2013, which started July 1, 2012, and ended June 30, 2013.

"The number is trending up, which is significant," said Jeff Amerine, director of Tech-

-nology Ventures, the university's technology-transfer office. "We'll find in the future that getting more than 40 will be a regular occurrence."

The fiscal 2013 figure included 18 disclosures by faculty with dual appointments at both the Fayetteville campus and the University of Arkansas System's statewide Division of Agriculture, which includes the Arkansas Agricultural Experiment Station and Cooperative Extension Service. The division's intellectual property is managed by Lisa Childs, who heads the Division's Technology Commercialization Office.

Both Technology Ventures and the Technology Commercialization Office assist U of A faculty and research scientists identify, protect, and commercialize intellectual property developed from their research or other university supported activities.

The offices encourage campus researchers to formally report their discoveries, because completing the intellectual property disclosure form is the first step toward transferring their inventions into marketplace products and services. Submitting the form is also required under a patent and copyright policy approved by trustees of the University of Arkansas System.

"We try to encourage the people who do the research to value this as much as they value publication," Amerine said. "We want high-quality disclosures, as if they were submitting something that will be reviewed by their peers."

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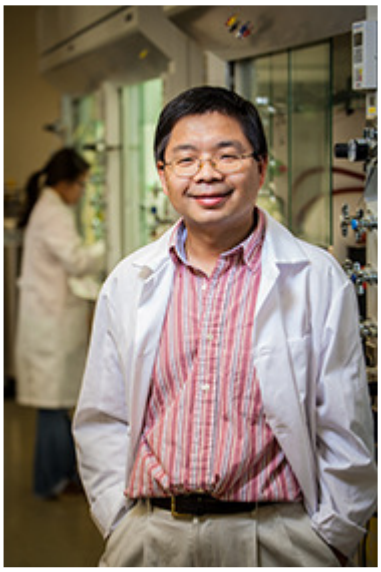
Organic Chemist Receives NSF CAREER Award



Nan Zheng

Nan Zheng, an assistant professor of chemistry at the University of Arkansas, has received a $550,000 Faculty Early Career Development Program award through the National Science Foundation to further his research in chemical reactions sparked by visible light.

Specifically, Zheng is investigating the development of environmentally sustainable methods for amine synthesis. The class of organic compounds known as amines is an important building block for pharmaceuticals.

Most organic compounds can't readily absorb visible light. Instead, organic chemists typically rely on ultraviolet, or UV light, which has disadvantages in photochemistry, a branch of chemistry concerned with the chemical effects of light. Zheng and his research team use visible light from commercial fluorescent light bulbs and light-emitting diodes (LEDs) to promote chemical reactions. Zheng calls this process "green" or "sustainable" chemistry.

"In sustainable chemistry, we want to create new reactions so that we can create a new molecule," Zheng said. "There is a lot of room here to discover new reactivity, in addition to the green nature of this whole process."

The office of vice provost for research and economic development maintains a full list of faculty who have won prestigious awards sponsored by government agencies,

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IN OTHER NEWS

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GRANT AWARD WINNERS

The following are the top 10 research grants (in terms of dollars) awarded to faculty in fiscal 2013, which ended June 30, with the principal investigator, the award amount and the sponsor.

non-profit foundations and private institutions. The list can be found here.

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Researcher Finds Dehydration in Young Athletes

Stavros Kavouras

Even when young players have water available while practicing soccer, they still became dehydrated, a University of Arkansas researcher found in a field study in Greece. Stavros

Kavouras, an assistant professor of exercise science, said the findings have implications for athletes everywhere of all ages, including the Arkansas football players who will start fall practice soon.

Every year, high school football players begin fall practice in Arkansas in August, the hottest month of the year. Dehydration is one factor coaches and athletic trainers should try to monitor closely, according to Kavouras' research.

Kavouras was the principal investigator who measured the initial hydration status of 107 boys between the ages of 11 and 16 on the second day of a summer sports camp. Of those, 72 of the young soccer players agreed to be monitored during two more training sessions during the camp.

The study found that 95 of 107 of the players were "hypohydrated," a condition caused by chronic dehydration, before the practice. The researchers found that nearly 96 percent of the players who agreed to be monitored were dehydrated after the training session on the third day and about 97 percent were dehydrated after the fifth day of training.

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2013 Arkansas Poll: Call for Questions

• Sean Mulvenon, $3,098,365, The Corporation for Developing Awareness of World Need Inc.
• Frank Millett, $1,042,877, National Institutes of Health
• Vasundara Varadan, $658,477, Arkansas Science & Technology Authority
• Alan Mantooth, $600,000, National Science Foundation
• Alan Mantooth, $473,336, Arkansas Science & Technology Authority
• Alan Mantooth, $431,935, Auburn University
• Brent Smith, $423,939, U.S. Department of Justice
• Jin-Woo Kim, $412,789, National Science Foundation
• Julian Fairey, $404,969, National Science Foundation
• Jackson Cothren, $400,000, Arkansas Science & Technology Authority
• Magda El-Shenawee, $400,000, National Science Foundation

The Arkansas Poll team of the Blair Center of Southern Politics and Society is pleased to announce its annual "call for questions." Proposals should be submitted by Monday, Aug. 19.

Now in its 15th year, the Poll is an annual statewide telephone survey of Arkansas adults. Each year, the research team allocates space for one or more collaborative partners to add items — free of charge — to our survey protocol. The research team is especially interested in proposals from new faculty and/or those with policy-related research interests.

They should be no more than three pages in length, and should address the general objectives and significance of the research project. Proposing scholars should include drafted questions (with response categories) and note potential publication outlets. The Arkansas Poll team works with collaborators to blend the needs of their projects with theirs, and to help them meet social scientific standards in survey design.

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CONTACT US

Vice Provost for Research and Economic Development
205 Administration Building
1 University of Arkansas
Fayetteville, AR 72701
479-575-2470
Website: vpred.uark.edu

University of Arkansas Arkansas Newswire

University of Arkansas Sets Record for Invention Disclosures

Total of 45 reported by campus faculty, staff continues upward trend

Wednesday, August 07, 2013

FAYETTEVILLE, Ark. — The University of Arkansas closed the last fiscal year with a record number of intellectual property disclosures reported by campus researchers.

Jeff Amerine, executive director, University of Arkansas Technology Ventures

Faculty and staff at the state's flagship university reported 45 inventions in fiscal year 2013, which started July 1, 2012, and ended June 30, 2013.

"The number is trending up, which is significant," said Jeff Amerine, director of Technology Ventures, the university's technology-transfer office. "We'll find in the future that getting more than 40 will be a regular occurrence."

The fiscal 2013 figure included 19 disclosures by faculty with dual appointments at both the Fayetteville campus and the University of Arkansas System's statewide Division of Agriculture, which includes the Arkansas Agricultural Experiment Station and Cooperative Extension Service. The division's intellectual property is managed by Lisa Childs, who heads the Division's Technology Commercialization Office.

Both Technology Ventures and the Technology Commercialization Office assist U of A faculty and research scientists identify, protect, and commercialize intellectual property developed from their research or other university supported activities.

The offices encourage campus researchers to formally report their discoveries, because completing the intellectual property disclosure form is the first step toward transferring their inventions into marketplace products and services. Submitting the form is also required under a patent and copyright policy approved by trustees of the University of Arkansas System.

The process begins when a researcher realizes they have uncovered inventive content, either patentable or protected as a trade secret, or in a rare instance a creation that could be trademarked, Amerine said. They then will fill out a disclosure form, in which they describe a number of aspects of their invention, including how it operates, how it is unique and what markets in which it would fit.

“We try to encourage the people who do the research to value this as much as they value publication,” Amerine said. “We want high-quality disclosures, as if they were submitting something that will be reviewed by their peers. We do sympathize with researchers because the IP disclosure is one more thing for them to do. We want them to know we are here to help.”

The title of the disclosure can be made public but the content is confidential in order to protect the university’s potential asset, Amerine said. Technology Ventures will study the disclosure and send it to an outside group that will review the document and identify the patent landscape and how the intellectual property will be competitive in the marketplace.

“From that, we will determine if the intellectual property is patentable,” Amerine said. “We’re trying to create relationships with large companies or start-ups. That’s the patent market. If we get to a point where we think there is something that is valuable and has patentable ground we’ll work with outside patent attorneys and spend the money on a provisional patent.”

The time frame from initial patent application to award could be almost four years.

“It’s a challenging process,” Amerine said. “If we have a licensee, our agreement with the licensee will dictate that they will pay for the costs of the patent. But if we don’t have a licensee, we’re spending substantial money on risk. If we think that the

market is interesting and that we have a probability of getting a licensee if we don't have one, we will move forward."

An interdisciplinary group of researchers that created new bacterial cell lines that simplify the development and manufacturing of protein therapeutics filed an intellectual property disclosure form in 2012. The group included Bob Beitle, professor of chemical engineering, Ellen Brune, who earned a doctorate in chemical engineering in May; and Ralph Henry, Distinguished Professor of biology. Two researchers at the University of Pittsburgh were also part of the team.

The U of A filed a provisional patent application in March 2012 and issued a license to commercialize the technology to the Fayetteville-based start-up company Boston Mountain Biotech last fall. Brune is chief scientific officer for the company.

Beitle said securing the intellectual property involved a lot of effort, especially filing for an international patent under the Patent Cooperation Treaty.

"Moving our technology from the lab bench to a company was an eye-opening experience," Beitle said. "The level of detail necessary to complete the PCT application was unexpected and had a steep learning curve. The process was made easier by working with Technology Ventures early so both sides — inventors of the technology, licensees, and those responsible for the grueling paper trail — aligned quickly."

Contacts:

Jeff Amerine, director
Technology Ventures
479-575-2995, jamerine@uark.edu (mailto:jamerine@uark.edu)

Chris Branam, research communications writer/editor
University Relations
479-575-4737, cwbranam@uark.edu (mailto:cwbranam@uark.edu)

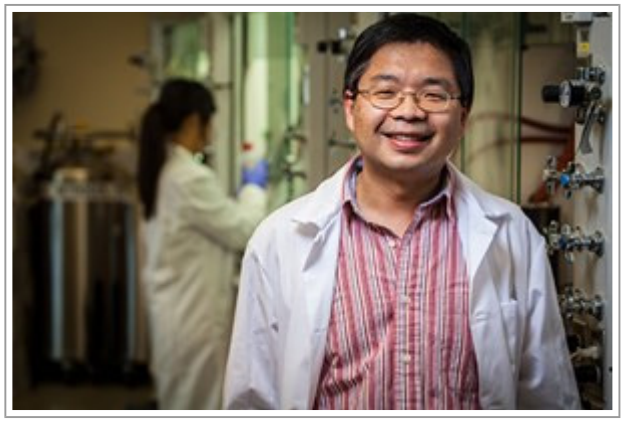
University of Arkansas Arkansas Newswire

Chemist Receives National Science Foundation Early Career Award

Chemical reactions sparked by light aid study of amines

Monday, August 05, 2013

FAYETTEVILLE, Ark. – Nan Zheng, an assistant professor of chemistry at the University of Arkansas, has received a $550,000 Faculty Early Career Development Program award through the National Science Foundation to further his research in chemical reactions sparked by visible light.



Nan Zheng, assistant professor of chemistry, University of Arkansas. Photo by Russell Cothren, University of Arkansas

Specifically, Zheng is investigating the development of environmentally sustainable methods for amine synthesis. The class of organic compounds known as amines is an important building block for pharmaceuticals.

Most organic compounds can't readily absorb visible light. Instead, organic chemists typically rely on ultraviolet, or UV light, which has disadvantages in photochemistry, a branch of chemistry concerned with the chemical effects of light. Zheng and his research team use visible light from commercial fluorescent light bulbs and light-emitting diodes (LEDs) to promote chemical reactions. Zheng calls this process "green" or "sustainable" chemistry.

"In sustainable chemistry, we want to create new reactions so that we can create a new molecule," Zheng said. "There is a lot of room here to discover new reactivity, in addition to the green nature of this whole process."

Zheng is particularly interested in challenges in processing new reactivity of amines.

“There is a problem with using visible light, which excites and moves electrons around to make the chemistry occur; most amines cannot absorb visible light efficiently,” he said. “We are zeroing in on using a catalyst to funnel the energy of the visible light to the amine.”

Zheng’s research team uses ruthenium and iridium complexes, metals bound to organic molecules that are active in the presence of visible light, as catalysts to promote chemical reactions in a range of organic molecules, including amines, which are common in bioactive compounds and pharmaceuticals.

Their preliminary research has shown that using visible light as an energy source with these catalysts has created new chemical reactions in amines, Zheng said.

“The neutral amine molecule is the starting material and it is unreactive to visible light,” he said. “Upon oxidation, which is the loss of one electron in the amine, it is converted into an amine radical cation, which is very reactive and then triggers reactions leading to new molecules that can be potentially used in drug discovery. The end product is potentially useful.”

Under the NSF grant, Zheng seeks to continue developing more new reactions through this type of green chemistry.

The five-year grant, better known as a CAREER award, is one of the highest honors given by the foundation to junior faculty members. Recipients are selected based on high-quality research and the integration of that research with education initiatives in the context of the university’s mission.

The CAREER award will support tuition assistance and assistantships for Theresa Nguyen and Jiang Wang, doctoral students who assist with Zheng’s research in his laboratory. It will also pay for initiatives planned by Zheng to help teach organic chemistry to undergraduate students.

A full list of U of A faculty who have received CAREER awards can be found here (http://vpred.uark.edu/281.php) .

Contacts:

Nan Zheng, assistant professor, chemistry and biochemistry
J. William Fulbright College of Arts and Sciences
479-575-5078, nzheng@uark.edu (mailto:nzheng@uark.edu)

Chris Branam, research communications writer/editor
University Relations
479-575-4737, cwbranam@uark.edu (mailto:cwbranam@uark.edu)

University of Arkansas Arkansas Newswire

Research: Dehydration Likely Among Young Athletes

Professor finds having water available didn't make difference

Friday, August 02, 2013

FAYETTEVILLE, Ark. – Even when young players have water available while practicing soccer, they still became dehydrated, a University of Arkansas researcher found in a field study in Greece. Stavros Kavouras, an assistant professor of exercise science, said the findings have implications for athletes everywhere of all ages, including the Arkansas football players who will start fall practice soon.

Stavros Kavouras

Every year, high school football players begin fall practice in Arkansas in August, the hottest month of the year. Dehydration is one factor coaches and athletic trainers should try to monitor closely, according to Kavouras' research.

Kavouras was the principal investigator who measured the initial hydration status of 107 boys between the ages of 11 and 16 on the second day of a summer sports camp. Of those, 72 of the young soccer players agreed to be monitored during two more training sessions during the camp.

The researchers calculated dehydration via changes in body weight. The boys were allowed to drink water whenever they wanted. Hydration status was also assessed by urine color and a lab test called urine specific gravity that measures the concentration of all chemical particles in the urine.

The study found that 95 of 107 of the players were "hypohydrated," a condition caused by chronic dehydration, before the practice. The researchers found that

nearly 96 percent of the players who agreed to be monitored were dehydrated after the training session on the third day and about 97 percent were dehydrated after the fifth day of training. Volunteers in the study had free access to water, but the researchers did not encourage them to drink it.

“These kids start training hypohydrated, and they do not drink enough during training, inducing even greater hypohydration,” Kavouras said.

He published a paper on the findings with five of his former colleagues in the department of nutrition and dietetics at Harokopio University in Athens, Greece. The paper appeared in the June edition of the *International Journal of Sport Nutrition and Exercise Metabolism (http://journals.humankinetics.com/ijsnem-current-issue/ijsnem-volume-23-issue-3-june/ad-libitum-fluid-intake-does-not-prevent-dehydration-in-suboptimally-hydrated-young-soccer-players-during-a-training-session-of-a-summer-camp)* .

It is well documented that dehydration increases physiological strain and perceived effort to perform the same exercise task and this is accentuated in warm weather, according to the researchers. The majority of published research has been performed with well-trained adults exercising in the heat, but little information is available concerning children exercising under similar environmental conditions.

This study suggests that the knowledge of the importance of drinking water is not by itself effective in changing behavior.

“Constant efforts must be made by athletic trainers, coaches and athletes to enhance hydration,” Kavouras said.

The study also found that the degree of exercise-induced hydration was not influenced by the players’ hydration status before they started exercising. This indicates that thirst may not be an effective signal to prevent further dehydration in already-dehydrated young athletes.

In a study on a related topic, Kavouras and two colleagues found that even a small degree of hypohydration, set at less than 2 percent of body weight, can reduce exercise performance and increase heat strain on adult cyclists.

Contacts:

Stavros Kavouras, assistant professor of exercise science
College of Education and Health Professions
479-575-5309, kavouras@uark.edu (mailto:kavouras@uark.edu)

Heidi Stambuck, director of communications
College of Education and Health Professions
479-575-3138, stambuck@uark.edu (mailto:stambuck@uark.edu)

University of Arkansas Arkansas Newswire

2013 Arkansas Poll: Call for Questions

Thursday, August 01, 2013

The Arkansas Poll team of the Blair Center of Southern Politics and Society is pleased to announce its annual "call for questions." Now in its 15th year, the Poll is an annual statewide telephone survey of Arkansas adults. Each year, the research team allocates space for one or more collaborative partners to add items – free of charge – to our survey protocol. The research team is especially interested in proposals from new faculty and/or those with policy-related research interests.

More about the Arkansas Poll: By collecting, analyzing, and disseminating accurate, impartial, and timely public opinion data about politics and policy, the Arkansas Poll simultaneously serves the teaching, research, and service components of the University's mission.

More about the proposal process: Many departments at the University of Arkansas are involved in important projects with public policy applications. Scholars from all disciplines – potential "collaborative partners" – are thus invited to propose policy-related questions for inclusion on the Arkansas Poll. Proposals from any member of the faculty (as well as well-qualified students) are encouraged and will be evaluated by the director and the polling team according to the following criteria:

- The research project is likely to result in a publishable product that brings credit to the proposing researcher, to the Arkansas Poll, and to the University of Arkansas
- The research project will advance the research agenda of a tenure-track scholar, or someone otherwise trying to "get established"
- The research project facilitates the Arkansas Poll's dual mission of service and research
- The research project is appropriate to the space available on the poll

Proposals should be submitted by Monday, Aug. 19. They should be no more than three pages in length, and should address the general objectives and significance of the research project. Proposing scholars should include drafted questions (with response categories) and note potential publication outlets. The Arkansas Poll team

works with collaborators to blend the needs of their projects with theirs, and to help them meet social scientific standards in survey design.

In accepting space on the Arkansas Poll, collaborative partners agree to credit the Arkansas Poll and the Blair Center of Southern Politics and Society (which supports the Poll) in all subsequent analysis, presentation, etc. and to forward copies of all scholarly publications, including conference papers, to the poll director below. Collaborative partners are encouraged to consider poll space an "in-kind" grant worth approximately $500 per question. Please note, too, that each ArkPoll dataset is considered to be in the public domain after approximately six months; there are no exclusive rights to analyzing any of the raw data after that point. In addition, simple descriptive analysis cannot be afforded proprietary rights at any time.

Inquiries should be addressed to Janine A. Parry, professor and Arkansas Poll director, Department of Political Science, 428 Old Main, parry@uark.edu, 479-575-6439.

Contacts:

Janine A. Parry, Professor & Arkansas Poll Director
Political Science
479-575-6439, parry@uark.edu (mailto:parry@uark.edu)