

Announcements

Core Vouchers due September 1, 2020

For more information, please use the following link: <https://inbre.uams.edu/funding-opportunities/research-vouchers/>. To get an official quote from the Core Facility please contact Dr. [Alan Tackett](#) prior to applying.

Bioinformatics Core

For your Bioinformatics Core support, please contact Drs. [Galina Glazko, Ph.D.](#) (UAMS) and [Phil Williams](#) (UALR). The [Bioinformatics Core Support Request Form](#) found on the [INBRE website](#).

AUTM Workshop/Webinar on Regional IDeA HUBS for Biomedical Tech Transfer Acceleration on June 17 at Noon – 1:15 EDT. For more information use the following link: <https://autm.net/careers-and-courses/webinars/live-webinars/regional-idea-hubs-for-biomedical-tech-transfer-ac>.

Message from the PI



Welcome to the inaugural issue of the Arkansas INBRE newsletter. Production of the newsletter will be led by Diane McKinstry. Diane, a member of the Arkansas INBRE administrative team since 2011, also manages the Undergraduate Summer Research Program. Diane and I are hoping that you will find the newsletter useful for keeping up with what is going on across the Arkansas INBRE network. We will need your help to insure that the newsletter stays relevant. Please send us your comments and suggestions for improvement as well as material for future newsletters.

By now most of you know that the grant that funds the Arkansas INBRE has been successfully renewed. With the additional five years of funding, the Arkansas INBRE will continue through at least April 30, 2025! There are far too many people who contributed to preparation of the application to thank for their efforts. It was truly a team effort. However, I do want acknowledge Caroline Miller-Robinson who has been the Project Manager for the Arkansas INBRE since it was created in 2001. For the proposal, Caroline prepared what is a very complex budget and was always able to assemble the Arkansas INBRE “accomplishments” in a way that would convince the reviewers that we had been productive during the previous funding period. I also want to acknowledge the UAMS Scientific Communications Group, especially Kerry Evans, Peggy Brenner, Eric Rathman and Bettie Cook. The final proposal was 1096 pages with more than 10 authors providing content. Kerry, Peggy, Eric and Bettie did extensive editing that resulted in a proposal that told the Arkansas INBRE story in the clearest way possible.

Going forward, we will continue all of the programs and activities that have been so successful and impactful. Our focus will continue to be on building biomedical research capacity statewide. Through the DRP Program, the awardees for Developmental Research Grants and Summer Research Grants have been selected. Once we get approval from NIGMS, those investigators can start their projects. The DRP Program will continue to offer “mini-sabbatical” and seminar speaker grants. New this year to the DRP Program is experimental design support to investigators in the network who are preparing grant applications. The Research Technology Core will continue to offer vouchers for faculty and student access to UAMS and UAF

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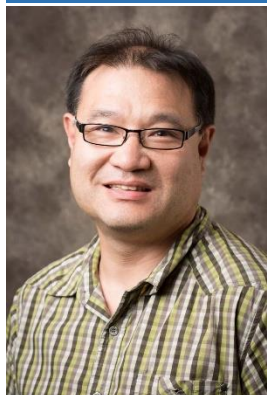
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core facilities. The joint UALR-UAMS bioinformatics graduate program continues as part of the Bioinformatics Core. In addition, Bioinformatics Core personnel will continue to support Arkansas INBRE investigators whose research involves “big data”. Finally, the Outreach Core will continue with Undergraduate Summer Research Program and the Arkansas INBRE Research Symposium held annually in Fayetteville.

Thanks for your continued support. I look forward to working with all of you over the next five years to grow biomedical research capacity in Arkansas.

Faculty Spotlight



Josh Sakon, PhD

University of Arkansas at Fayetteville

Dr. Josh Sakon is a professor in the Department of Chemistry and Biochemistry at the University of Arkansas. His laboratory uses X-ray diffraction to study the biochemistry of large molecules at the atomic level. Recently, Dr. Sakon was one of seven award recipients through the NIH-funded XLerator Network’s Ideas-to-Products (I2P) Program. Link to the announcement: <https://xleratornetwork.com/i2p/>. Dr. Sakon is working on a novel, lesion-seeking biologic that has the potential to improve cardiac function after stent placement to treat coronary blockages and minimize the risk of subsequent heart failure. Dr. Sakon and his collaborators will develop and test a novel human fibroblast growth factor fused to a collagen binding domain that will be released through a stent. The approach improves current methods of controlled release as it takes advantage of

specific biochemical events that occur during adverse ventricular remodeling. Safety and feasibility assessments will be conducted with the long-term goal being development of a therapeutic that can be used to promote regeneration of heart muscle following damage due to a myocardial infarction or heart attack.

Dr. Sakon joined the University of Arkansas faculty in 1997. He is one of Arkansas BRIN/INBRE “pioneers”. His involvement in the Arkansas INBRE began in 2001 when the Arkansas BRIN was first funded through a grant from the NIH National Center for Research Resources. Dr. Sakon co-directs the Biotechnology Core and in that role helps Arkansas INBRE network faculty and students access University of Arkansas core facilities.

What you might not know about Dr. Sakon...

Finished 84th in 2001 Boston Marathon (2:36:20)

A gourmet chef who teaches a popular UARK course “Molecular Gastronomy” featuring modernist and traditional techniques

Development Research Project Program

Jerry Ware, PhD, Program Director



Moving forward with a new 5-year renewal of the Arkansas INBRE, I want to update you on The Developmental Research Project (DRP) Program. Indeed, the DRP Program is a cornerstone of the Arkansas INBRE to expand and support sustainable biomedical research among the Primarily Undergraduate Institutions (PUIs) in Arkansas. Insuring you are on the Arkansas INBRE email list we’ll keep you up-to-date of the various Funding Opportunity Announcements (FOAs) as they are announced. The DRP Program supports a wide-range of opportunities throughout the year, including seminar support, mini-sabbatical support, equipment purchase, faculty recruitment, and support of PUI faculty research in their laboratories. Details on each of these funding opportunities can

be found on the Arkansas INBRE website or you can always direct questions to me (jware@uams.edu) or Dr. Tom Kelly (KellyThomasJ@uams.edu).

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Upcoming FOAs for the summer will include a new funding mechanism, Collaborative Research Grants, and Equipment Purchase Grants. These FOAs will be available by mid-June. Faculty wishing to apply for Research opportunities are strongly encouraged to attend an INBRE-sponsored Grant Writing Workshop. These workshops are typically presented 6-8 weeks prior to a proposal deadline and provide guidance and tips for a successful application based on the NIH format of proposals. A tentative workshop is being planned for June 26th via a 3-4 hour Zoom presentation led by the Arkansas INBRE Leadership and scientific writers from the UAMS Science Communication Group. Registration details will be coming soon.

In anticipation of receiving our competitive renewal, FOAs were released in 2019 for our Research Development Grants (RDG) and the 2020 Summer Research Grants (SRGs). We were pleased to receive twenty-five applications from nine PUIs in response to the RDG FOA and sixteen applications from eight PUIs in response to the SRG FOA. The quality of the proposals was outstanding and it is a credit to the excellent work being done among all the PUI faculty. We were able to support nine RDG applications and seven SRG proposals representing ten different PUIs in the state. The funded projects are listed below and we look forward in future newsletters to highlight the accomplishments of each Project Leader.

Research Development Grants

David Donley, Harding University

Evaluating how free radicals shape microglia during neurological disease

Victoria Dunlap, University of Central Arkansas

Effects of environment and neurodegenerative proteins on PEP-10 and calmodulin

Bill Gunderson, Hendrix College

Spectroscopic characterization of the iron-sulfur repair enzyme, YtfE

Zeeshan Habeeb, University of Arkansas at Pine Bluff

Improving bioavailability and active targeting of cisplatin by peptidic foldamers

Sharon Hamilton, Ouachita Baptist University

Incorporating proteins in novel modern wound dressing

Arijit Mukherjee, University of Central Arkansas

Using molecular genetic approaches to study plant-microbe symbiosis

Rodney Roosevelt, Arkansas Tech University

Testing the noradrenergic hypothesis of transcutaneous vagus nerve stimulation

Shanzhi Wang, University of Arkansas at Little Rock

*Protein production and inhibitors of extracellular proteases of *S. aureus**

Jianfeng (Jay) Xu, Arkansas State University

Oral delivery of a plant cell-encapsulated biopharmaceutical for treatment of inflammatory bowel disease

2020 Summer Research Grants

Mohammad Alam, Arkansas State University

Trifluoromethyl substituted pyrazole derivatives as antibacterial agents

Marline Bossus, Lyon College

*Mechanisms of osmoregulation in *Ambystoma mexicanum**

Tamara Haselkorn, University of Central Arkansas

Bacterial symbionts of social amoebas and their effect on microbiome formation

Rajput Mrigendra, Arkansas Tech University

Effect of early life stress induced virome on neonatal gut health

Ruth Plymale, Ouachita Baptist University

Characterization of antimicrobial bacteria effective against ESKAPE pathogens

Jeffrey Shaver, University of Arkansas at Fort Smith

Influence of membrane desaturation and biotic stress on chloroplast DNA integrity

Noureen Siraj, University of Arkansas at Little Rock

Understanding the cytotoxicity of tunable chemo-PTT ionic nanomaterials

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2020 INBRE-Sponsored Faculty Recruitments

Arkansas Tech University / Arkansas State University / University of Central Arkansas

Student Spotlight



Lisa Orr

2012 Former INBRE Student

Lisa Orr is a graduate from the University of Arkansas at Little Rock where she received a Bachelor of Science degree in Chemistry. Her goal after receiving her degree was to attend graduate school and earn a PhD. Lisa participated in the INBRE program during the summer of 2012 at the University of Arkansas for Medical Sciences in the laboratory of Dr. Alan Tackett. Her summer experience reaffirmed her decision to go to graduate school. During the summer of 2012, Lisa was given an opportunity to focus on her own research project, "Deciphering the breast cancer histone code". She gave an oral presentation of her work and findings at the Undergraduate Research Symposium in Biomedical Sciences in Little Rock, Arkansas.

Unfortunately, due to unexpected circumstances and personal health issues, she was unable to pursue an education beyond the undergraduate level. However, her research ambitions did not end there. Lisa started employment at UAMS with a career in research where she is working as a Research Associate in the UAMS Proteomics Core and a lab manager for Dr. Tackett. These positions give Lisa the opportunity to collaborate with both internal and external researchers, and work on her own projects. Through these efforts, Lisa is an author on eight publications and has been a poster presenter at several international meetings. Since the beginning of her employment at UAMS in May of 2014, Lisa has had three promotions! Most of her days are spent at the lab bench doing what she loves to do.

Recent Publications

1. **Choudhury R**, Quattlebaum B, Conkin C, Patel SR, Mendenhall K. [Dual luminescent charge transfer probe for quantitative detection of serum albumin in aqueous samples.](#) Spectrochim Acta A Mol Biomol Spectrosc. 2020 Jul 5;235:118305. doi: 10.1016/j.saa.2020.118305. Epub 2020 Mar 24. PubMed PMID: 32259717; PubMed Central PMCID: PMC7196023.
2. Demirel D, Cetinsaya B, **Halic T, Kockara S**, Reiners D, Ahmadi S, Arikatla S. [A partition-based optimization model and its performance benchmark for Generative Anatomy Modeling Language.](#) Comput Biol Med. 2020 Apr;119:103695. doi: 10.1016/j.combiomed.2020.103695. Epub 2020 Mar 5. PubMed PMID: 32339127; PubMed Central PMCID: PMC7197414.
3. Sustich SJ, Afrose F, **Greathouse DV, Koeppe RE 2nd.** [Influence of interfacial tryptophan residues on an arginine-flanked transmembrane helix.](#) Biochim Biophys Acta Biomembr. 2020 Feb 1;1862(2):183134. doi: 10.1016/j.bbamem.2019.183134. Epub 2019 Nov 16. PubMed PMID: 31738898; PubMed Central PMCID: PMC6943188.
4. Zhang H, Ramsey A, Xiao Y, Karki U, Xie JY, Xu J, Kelly T, Ono S, **Zhou GL.** [Dynamic Phosphorylation and Dephosphorylation of Cyclase-Associated Protein 1 by Antagonistic Signaling through Cyclin-Dependent Kinase 5 and cAMP Are Critical for the Protein Functions in Actin Filament Disassembly and Cell Adhesion.](#) Mol Cell Biol. 2020 Jan 30;40(4). doi: 10.1128/MCB.00282-19. Print 2020 Jan 30. PubMed PMID: 31791978; PubMed Central PMCID: PMC6996279.

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5. Kakraba S, Ayyadevara S, Penthala NR, Balasubramaniam M, Ganne A, Liu L, Alla R, Bommagani SB, Barger SW, Griffin WST, Crooks PA, Shmookler Reis RJ. [A Novel Microtubule-Binding Drug Attenuates and Reverses Protein Aggregation in Animal Models of Alzheimer's Disease](#). *Front Mol Neurosci*. 2019;12:310. doi: 10.3389/fnmol.2019.00310. eCollection 2019. PubMed PMID: 31920540; PubMed Central PMCID: PMC6920216.
6. Smolander J, Stupnikov A, **Glazko G**, Dehmer M, Emmert-Streib F. [Comparing biological information contained in mRNA and non-coding RNAs for classification of lung cancer patients](#). *BMC Cancer*. 2019 Dec 3;19(1):1176. doi: 10.1186/s12885-019-6338-1. PubMed PMID: 31796020; PubMed Central PMCID: PMC6892207.
7. Zhang N, Wright T, Caraway P, **Xu J**. [Enhanced secretion of human \$\alpha\$ 1-antitrypsin expressed with a novel glycosylation module in tobacco BY-2 cell culture](#). *Bioengineered*. 2019 Dec;10(1):87-97. doi: 10.1080/21655979.2019.1604037. PubMed PMID: 30957636; PubMed Central PMCID: PMC6527068.
8. Lipinski K, McKay MJ, Afrose F, Martfeld AN, **Koeppe RE 2nd, Greathouse DV**. [Influence of Lipid Saturation, Hydrophobic Length and Cholesterol on Double-Arginine-Containing Helical Peptides in Bilayer Membranes](#). *Chembiochem*. 2019 Nov 4;20 (21):2784-2792. doi: 10.1002/cbic.201900282. Epub 2019 Sep 18. PubMed PMID: 31150136; PubMed Central PMCID: PMC6829048.
9. McKay MJ, Fu R, **Greathouse DV, Koeppe RE 2nd**. [Breaking the Backbone: Central Arginine Residues Induce Membrane Exit and Helix Distortions within a Dynamic Membrane Peptide](#). *J Phys Chem B*. 2019 Sep 26;123 (38):8034-8047. doi: 10.1021/acs.jpcc.9b06034. Epub 2019 Sep 17. PubMed PMID: 31483653; PubMed Central PMCID: PMC6765365.
10. Whitt J, Duke C, Ali MA, Chambers SA, Khan MMK, Gilmore D, **Alam MA**. [Synthesis and Antimicrobial Studies of 4-\[3-\(3-Fluorophenyl\)-4-formyl-1H-pyrazol-1-yl\]benzoic Acid and 4-\[3-\(4-Fluorophenyl\)-4-formyl-1H-pyrazol-1-yl\]benzoic Acid as Potent Growth Inhibitors of Drug-Resistant Bacteria](#). *ACS Omega*. 2019 Sep 3;4(10):14284-14293. doi: 10.1021/acsomega.9b01967. eCollection 2019 Sep 3. PubMed PMID: 31508552; PubMed Central PMCID: PMC6733178.

*Names in bold are Arkansas INBRE PUI Project Leaders and Core Directors.

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