

Announcements

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

NIGMS Co-Funding

NIGMS provides co-funding to support R01, R15, and R35 applications from investigators in IDeA states that receive meritorious scores but fall outside an IC's pay line. If you believe your proposal may be eligible for co-funding, contact the IDeA co-funding coordinator at the appropriate NIH IC. For more information, visit the IDeA co-funding website:

<https://www.nigms.nih.gov/Research/DRCB/IDeA/Pages/IDeA-Co-funding.aspx>.

Upcoming Meetings

IDeA National Resource Summer Internships for Undergraduate Students in Proteomics
Program Dates: May 23-July 29, 2022

Arkansas INBRE Summer Mentored Research Program
Program Dates: May 23-July 29, 2022

2022 Grant Writers Coaching Group for NIH Awards, San Antonio, TX
June 16, 2022

The Grant Writers Coaching Group for NIH Awards is designed for racial and ethnic minority faculty who are actively working on a K or R NIH grant proposal. The goal of the program is to support minority faculty in improving critical writing skills to strengthen grant proposals.

2022 KY INBRE Essentials of Next Generation Sequencing Virtual Workshop
June 27-30, 2022

This workshop will introduce participants to the use of common and open-source tools for data analysis (genomic, RNAseq). No prior experience or background is required. Follow the [link](#) for more information.

NCURA 64th Annual Meeting
August 7-10, 2022
Workshop Days: August 6, 7, & 10, 2022
Washington, DC
[Registration Link](#)

2022 NISBRE Conference (will be held virtually)
October 5-7, 2022

Message from the PI



On May 23rd, this year's edition of the Arkansas INBRE Summer Research Program for Undergraduate Students started. Participants total 22 students from 12 different colleges/universities who will be conducting biomedical research over a ten week period in laboratories at either UAMS or UAF. The Arkansas INBRE Summer Research Program for Undergraduate Students was first offered in 2002 and with the exception of summer 2020 due to the pandemic has been an annual occurrence since then. Summer research experiences provide an array of benefits to undergraduate students that include the opportunity to explore post-baccalaureate training and career options. Recognizing that there are a wide array of career opportunities that impact human health through research, we have been "tweaking"

the Summer Research Program for Undergraduate Students in order to provide experiences that are tailored to student interests. The first "tweak" occurred two years ago and was the creation of opportunities within the IDeA National Center for Quantitative Proteomics that provide a tailored research experience for undergraduate students who are considering a career as a director of a core facility. Dr. Dennis Province provides the leadership and this year there are two students participating in the program. A second program, called Professional Research Opportunities, was started this year, and is designed for students who are considering a career as a research technician. Dr. Jesús Delgado-Calle leads this program which has two students. Finally, the Arkansas INBRE and the UAMS Winthrop P. Rockefeller Cancer Institute have collaborated to provide research experiences to students interested in careers in cancer research. This program is led by Dr. Tom Kelly and this year there are three students who are participating. All students in the "traditional" Arkansas INBRE Summer Research Program for Undergraduate Students as well as those students in the programs led by Drs. Province, Delgado-Calle and Kelly participate in the weekly workshops and social events that comprise the INBRE Summer Program schedule. The other constant among the four summer research programs is the leadership provided by Dr. Feng Wang, Outreach Core Director, and Diane McKinstry, Outreach Program Manager. My deep appreciation to both Dr. Wang and Ms. McKinstry as well as the mentors for their efforts in making the Arkansas INBRE Summer Research Program the success that it is.

Faculty Spotlight



Irosha Nawarathne, PhD
Associate Professor
Lyon College

I was born and raised in Sri Lanka, a beautiful island in the Indian Ocean. I earned my undergraduate degree (BS Honors) majoring in chemistry from University of Colombo, Sri Lanka in 2004. Following that I worked as an assistant lecturer at the same university for about nine months before I decided to fly across the world to pursue a higher education in the US. I received my PhD in bioorganic chemistry from Michigan State University, East Lansing, in 2011. My dissertation research focused on generating biologically important paclitaxel (Taxol®) analogues by utilizing *Taxus* acyltransferases as biocatalysts in Dr. Kevin D. Walker's laboratory.

In addition to dissertation research, I pursued a two-year diploma - Certification in College Teaching during my time at Michigan State University as I had a great passion for becoming a college educator someday. To

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develop further biomedical research skills, specifically medicinal chemistry, I decided to join the College of Pharmacy at University of Michigan in Ann Arbor, as a research fellow, and conducted postdoctoral research on antibiotic development in Dr. George Garcia's laboratory. Prior to my postdoctoral training, I took a semester break to work as a fixed-term faculty at the Central Michigan University teaching an introductory organic chemistry course and a graduate level biochemistry course to gain further experience in college teaching. I had to cut my 5-year postdoctoral fellowship short to 2 years when I accepted an organic chemistry faculty position at Lyon College in fall 2014 where my husband also worked in the mathematics department.

My passion for science was inspired by my father, a retired bank officer now. He walked me through the woods, swam with me in the ocean, trained me to speak to plants, birds, and animals, and showed me the beauty of nature. I grew up wanting to become a plant biologist up until I started learning organic chemistry – the definition of nature – in high school. My high school chemistry teachers encouraged me to become a chemist and college education affirmed that. As an undergraduate, I worked in Dr. Dilip de Silva's laboratory extracting, isolating, and characterizing antifungal agents from a medicinal plant which was fascinating work for an ambitious, first-generation college student. My passion for teaching was sparked by my mother, a homemaker, who inspired any young mind she encountered to achieve to their fullest capacity. Through teaching/mentoring, now I try to inspire young minds to explore more, dream bigger, and advance further. I have been fortunate to have the best mentors in college, graduate school, and post-graduate career and during my faculty career Arkansas INBRE administration has provided me with the best mentorship since 2014.

At Lyon, I have a full teaching load during any academic year that includes Organic Chemistry sequence, Instrumental Analysis, Chemistry Seminars, Introductory Chemistry, and other topics in chemistry such as bioorganic chemistry, recycling and conservation, chemical biology of infectious diseases. My undergraduate research team, 6-9 student scholars at any given time, works on the development of novel rifamycins to combat multi-drug resistant *Mycobacterium tuberculosis* (MTB) strains by gaining a deeper understanding of molecular interactions between rifamycins and MTB RNA polymerase. Additionally, we also work on developing an array of simple naphthoquinones that have potential for becoming anti-lung cancer and antibacterial agents. We have close collaborations with the laboratories of Dr. Ruud Dings, Dr. Daniel Voth, and Dr. Robert Eoff at UAMS. We have also expanded our research explorations towards food chemistry and environmental chemistry lately. I have also served as the faculty adviser for the award-winning Lyon chapter of Mortar Board National Honor Society since 2015 and have received the "Excellence in Advising Award" from the nationals in 2020. I try to actively represent categories of diversity I fall into and also keenly support all types of students to do the same.

Arkansas INBRE has been instrumental for our research program providing funding and advice, helping to find mentors and collaborators, helping technology transfer processes, building research infrastructure for drug discovery at Lyon, manuscript preparation, and more. A majority of the chemical instrumentation housed at Lyon is supported by Arkansas INBRE. In addition, I have received multiple summer research grants and supplementary grants to support student stipends and conference travel from Arkansas INBRE. Without Arkansas INBRE voucher program, we cannot utilize the state-wide facilities such as NMR and Mass which are essential for our line of work. I look forward to closely working with the Arkansas INBRE supporting my student scholars to advance science while advancing their minds.

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

She is always called Dr. Irosha even in the professional settings; only a daring student calls her Dr. Nawarathne (only 2 students since 2014). Some colleagues joking say that she is Beyoncé at Lyon College (no one uses her last name either).

She has worked as a professional dubbing artist for cartoon characters at the National Television Corporation in Sri Lanka throughout her college years. She enjoys singing in Sinhala, her mother tongue.

She and her husband, Tharanga, travel throughout Arkansas and the US. Their favorite summer retreat in Arkansas is the Sylamore Creek in Mountain View. Her favorite US national park is Glacier, Montana. What she loves to do the most is to swim all day-every day and to live by the ocean. No matter where she travels/lives, Michigan is her home in the US (only second to Sri Lanka) and she's a devoted Spartan.

Development Research Project Program

Jerry Ware, PhD, Program Director



Arkansas INBRE Wants to Hit the Road

Since March 2020, our ability to connect with the Arkansas INBRE network has primarily been limited to virtual (Zoom) visits. However, starting this Fall we would like to hit the road and visit PUIs. Interacting with faculty and students was an anticipated highlight of our pre-Covid campus visits.

Visiting with currently supported faculty and students is a priority, but we would also enjoy meeting with any science-oriented clubs to share Arkansas-INBRE supported opportunities for undergraduate students.

Over the summer, we would like to schedule visits to start in the Fall. Thus, if you would like members of the INBRE administration to visit your campus, we welcome the opportunity. Whether as a group of faculty, or member of the Arkansas INBRE Steering Committee, please consider reaching out to us. We want to see and hear how INBRE has impacted your campus and importantly hear suggestions for improvement going forward. Please contact myself (jware@uams.edu), or Caroline Miller-Robinson (CMillerRobinson@uams.edu) and let's find a day that works for everyone and plan a get-together.

Ongoing Summer Research Grants and Manuscript Workshop

2022 Summer Research Awards on PUI campuses:

University of Central Arkansas; **Kerry Barnett, Department of Chemistry & Biochemistry**

"Novel ancillary ligands for the nickel catalyzed amination of aryl-methyl ether"

Goal: To use nickel catalyzed cross-coupling reactions in the synthesis of bioactive natural products and pharmaceuticals

Arkansas State University; **Abrar Alam, Department of Chemistry**

"Aminoethyl pyrazole derivative as broad-spectrum antibacterial agents"

Goal: To discover new anti-microbial compounds against gram-positive and negative bacteria

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Hendrix College; **Caitlin Scott, Department of Chemistry**

"Analysis of CB1 receptor-agonist molecular dynamics data to explain activations"

Goal: To determine the structure of the activated conformation of the cannabinoid receptor as a potential target to mitigate pain

Arkansas Tech University; **Surya Banerjee, Department of Biology**

"Effect of molecular interaction between Tsh & TCtBP on eye development"

Goal: To analyze gene expression in the context of eye development using Drosophila as a model organism

2022 Summer Manuscript Workshops:

Twelve PUI faculty from 8 different institutions are receiving support for manuscript writing activities. A series of Zoom meetings will be held to support writing and manuscript submissions during the summer.

Naumiec – Weinkopff Collaborative Research Award

Congratulations to Greg Naumiec (UCA) and Tiffany Weinkopff (UAMS) for their Research Award designed to develop collaborations between INBRE-supported investigators (Naumiec) and investigators currently supported by a COBRE (Centers of Biomedical Research Excellence, Weinkopff). Their project, entitled '*The synthesis and testing of a comprehensive disquaramide drug library targeting leishmaniasis*' is funded as a supplement to the Arkansas INBRE from NIGMS to support investigators with overlapping interest and complimentary expertise. This is the second INBRE/COBRE collaborative supplement awarded to the Arkansas INBRE. The first was an award to Jianfeng Xu (Arkansas State University) and Jason Farrar (UAMS) that funded a project that optimized production of mammalian erythropoietin in plant cells.

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Student Spotlight

2022 INBRE Summer Research Students

Cancer Fellowship

	Nathaniel Gonzales University of Arkansas, Fort Smith Mentor: Suresh Thallapuram, PhD		Mary Katherine McKenzie Henderson State University Mentor: Robert Eoff, PhD		Stetson Van Matre University of Central Arkansas Mentor: Adam Wolfe, MD, PhD
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	Jayden Carter University of Central Arkansas Mentor: Elena Ambrogini, PhD		Jomeeka Meeks University of Central Arkansas Mentor: Teresita Bellido, PhD
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Proteomics

	Dayoung Eom University of Central Arkansas Mentor: Dennis Province, PhD		Walker Hendricks Harding University Mentor: Dennis Province, PhD
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INBRE, UAF

	Morganne Browning Arkansas Tech University Mentor: Jamie Baum, PhD		Joseph Chrisman University of the Ozarks Mentor: Fiona Goggin, PhD		Ragan Edison Harding University Mentor: Kyle Quinn, PhD
	Cody Funk John Brown University Mentor: Daniel Lessner, PhD		Caroline House John Brown University Mentor: Doug Rhoads, PhD		Kneisha McDonald University of the Ozarks Mentor: Jingyi Chen, PhD

INBRE, UAMS

	Dustin Cannon Lyon College Mentor: Roy Morello, PhD		Luke Enemark John Hopkins University Mentor: Brendan Frett, PhD		Jackson Gill Henderson State University Mentor: Mark Manzano, PhD
	Victoria Lopez University of the Ozarks Mentor: Youssef Aachoui, PhD		Victoria Ortega Hendrix College Mentor: Angela Odle, PhD		BreeAnna Scott University of Arkansas, Fayetteville Mentor: Jesús Delgado-Calle, PhD
	Robert Shaver University of Arkansas, Fayetteville Mentor: Melda Onal, PhD		Ethan Talley University of Arkansas, Fayetteville Mentor: Intawat Nookaew, PhD		Alexx Weaver Arkansas State University Mentor: Jon Blevins, PhD

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Recent Publications

Zubair M, Hamzah R, Griffin R, Ali N. *Identification and functional characterization of multiple inositol polyphosphate phosphatase1 (Minpp1) isoform-2 in exosomes with potential to modulate tumor microenvironment.* PLoS One. 2022 Mar 2;17(3):e0264451. doi: 10.1371/journal.pone.0264451. PMID: 35235602; PMCID: PMC8890658.

Choudhury R, Sharma AK, Paudel P, Wilson P, Pereira AB. *In situ generation of a Zwitterionic fluorescent probe for detection of human serum albumin protein.* Anal Biochem. 2022 Jun 1;646:114630. doi: 10.1016/j.ab.2022.114630. Epub 2022 Mar 4. PMID: 35248557; PMCID: PMC9018593.

Causey JL, Li K, Chen X, Dong W, Walker K, Qualls JA, Stubblefield J, Moore JH, Guan Y, Huang X. *Spatial Pyramid Pooling With 3D Convolution Improves Lung Cancer Detection.* IEEE/ACM Trans Comput Biol Bioinform. 2022 Mar-Apr;19(2):1165-1172. doi: 10.1109/TCBB.2020.3027744. Epub 2022 Apr 1. PMID: 32991288; PMCID: PMC9068281.

Zheng D, Yuan Y, Wang F. *Fragmentation Method for Computing Quantum Mechanics and Molecular Mechanics Gradients for Force Matching: Validation with Hydration Free Energy Predictions Using Adaptive Force Matching.* J Phys Chem A. 2022 Apr 28;126(16):2609-2617. doi: 10.1021/acs.jpca.2c01615. Epub 2022 Apr 14. PMID: 35420821; PMCID: PMC9059759.

Corken A, Ghosh SP, Du R, Boerma M, Ware J, Pathak R. *Platelet glycoprotein Iba provides radiation protection.* Radiother Oncol. 2022 Feb;167:143-148. doi: 10.1016/j.radonc.2021.12.030. Epub 2021 Dec 28. PMID: 34971661; PMCID: PMC8934272.

Wiggins G, Thomas J, Rahmatallah Y, Deen C, Haynes A, Degon Z, Glazko G, Mukherjee A. *Common gene expression patterns are observed in rice roots during associations with plant growth-promoting bacteria, Herbaspirillum seropedicae and Azospirillum brasiliense.* Sci Rep. 2022 May 25;12(1):8827. doi: 10.1038/s41598-022-12285-3. PMID: 35614083; PMCID: PMC9132972.

#sharingnews

Nakita Lovelady, PhD, MPH, former INBRE Scholar, is one of nine Translational Research Institutes KL2 Scholars to receive an award that will provide 75% salary support and up to \$25K a year for research, tuition, travel and education for the next two years. Congratulations Dr. Lovelady!

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On May 25th, the Arkansas IDeA Network of Biomedical Research Excellence (INBRE) hosted a workshop on obesity and diabetes. Tom Kelly, PhD, INBRE PUI Liaison, organized the workshop that was attended by 15 undergraduate college students from around the state including Fayetteville, Gentry, Searcy and other sites. Joseph Henske, MD, Associate Professor of Internal Medicine Endocrinology started the workshop off with an engaging presentation about diabetes. Dinesh Edem, MD, Assistant Professor of Internal Medicine Endocrinology, gave a great talk about obesity describing it as the king of all maladies because it plays a role in seven of the top 10 deadliest diseases. The students then rotated in small groups to learn about the obesity and diabetes research being conducted by UAMS investigators and what type of education and training it takes to do this research. The research teams were led by: Michael Thomsen, PhD, Professor in College of Public Health; Tiffany Miles, PhD, Post-Doctoral fellow in Department of Neurobiology and Developmental Sciences; Emir Tas, MD, Assistant Professor of Pediatrics; Eva Diaz Fuentes, MD, Assistant Professor of Pediatrics; and Elisabet Børshøj, PhD, Professor of Pediatrics. During lunch Lee Ann MacMillan-Crow, PhD, Director of the Graduate Program in Interdisciplinary Biomedical Sciences, described the program and the application process to the students. The day wrapped up with a lively panel discussion moderated by Dr. Jerry Ware, Professor of Physiology and Cell Biology, featuring Drs. Thomsen, Børshøj, and Miles.



Emir Tas, MD



Elisabet Børshøj, PhD



Tiffany Miles, PhD



Joseph Henske, MD



Dinesh Edem, MD



Michael Thomsen, PhD



Eva Diaz Fuentes, MD

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