UAMS

Research & Innovation

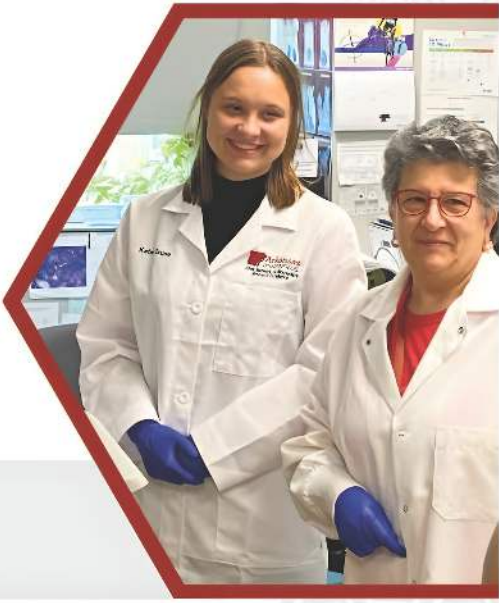
UAMS Showcase of Medical Discoveries

A Research & Innovation event featuring UAMS investigators showcasing their research and discoveries.

Nov 20, 2025 | 4 to 6 pm
Jack Stephens Spine Institute
12th Floor

Arkansas IDeA Network of Biomedical Research Excellence

Advancing Biomedical Research in Arkansas



Arkansas INBRE
IDeA Network of Biomedical Research Excellence

https://inbre.uams.edu

#weARinbre

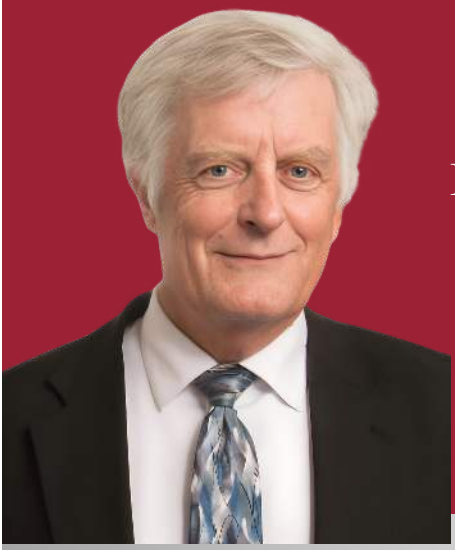
Welcome Message

Daniel Voth
Vice Chancellor for Research & Innovation

Welcome to the UAMS Showcase of Medical Discoveries. This edition, and our final showcase of 2025, features the Arkansas INBRE Program, which fosters biomedical research, education, and collaboration across Arkansas. Through mentoring, funding, and shared research resources, INBRE empowers investigators at UAMS and partnering institutions to build strong research programs and prepare the next generation of scientists.

We are proud to highlight the innovative work supported by INBRE that drives discovery, strengthens research capacity, and expands opportunities for scientific advancement throughout our state.

Thank you for joining us in this closing showcase of the year as we celebrate the partnerships and discoveries that advance health, innovation, and excellence in biomedical research at UAMS.



Lawrence Cornett, Ph.D.

Distinguished Professor
Principal Investigator/Program Director, INBRE Award
Department of Physiology & Cell Biology, College of Medicine
UAMS

Program Summary

The National Institutes of Health (NIH) National Institute of General Medical Sciences (NIGMS) Institutional Development Awards (IDeA) Networks of Biomedical Research Excellence (INBRE) program funds statewide networks of higher education and research institutions in 23 IDeA-states and in Puerto Rico to build biomedical research capacity through support for faculty and student research and mentoring, and research infrastructure enhancement at network institutions. These programs are five-year renewable grants.

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Arkansas INBRE was established in 2001. The statewide network includes two comprehensive research universities (UAMS and UAF) and 16 primarily undergraduate institutions. The goals of the Arkansas INBRE are to:

- Expand and strengthen the biomedical research infrastructure through a multidisciplinary network.
- Increase the biomedical research base in Arkansas by providing research support and augmenting faculty efforts to obtain independent extramural funding.
- Provide undergraduate research opportunities, thereby serving as a “pipeline” that encourages students to choose health research careers.
- Sponsor specialized outreach activities for faculty and students, preparing early-stage investigators for future INBRE support.
- Enhance the science and technology base of Arkansas’s future workforce by developing a cadre of trained scientists and providing resources to stimulate the growth of biotechnology industries in Arkansas.

Arkansas INBRE Administrative Core

Lawrence Cornett, Ph.D., Principal Investigator/Program Director, INBRE Award
Jerry Ware, Ph.D., Associate Director
Shani Worrell, Ed.D, Internal Evaluator
Diane McKinstry, BBA, Student Program Manger
Caroline Miller Robinson, BS, Program Financial Manager
Cyndy Buckhaults, BA, Media Specialist

Arkansas IDeA Network of Biomedical Research Excellence: Advancing Biomedical Research in Arkansas

The primary goal of the Arkansas IDeA Network of Biomedical Research Excellence (INBRE) is to expand biomedical research capacity in Arkansas. Scientific leadership for the network is provided by 2 research intensive lead institutions: the University of Arkansas for Medical Sciences (UAMS) and the University of Arkansas, Fayetteville (UAF). In addition, the lead institutions, and Arkansas Children's Research Institute (ACRI) provide resources and mentoring to 16 statewide primarily undergraduate institutions (PUIs), that range from a large urban university to small liberal arts colleges and historically black colleges and universities. To achieve its goals, the Arkansas INBRE administers

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programs with the following objectives: *i)* support PUI faculty research and mentoring, *ii)* support and promote student participation in biomedical research, and *iii)* grow biomedical research infrastructure across the network. The programs are managed by 4 interactive and synergistic network components. The Administrative Core provides operational support, opportunities for undergraduate students to participate in research, support for PUI faculty development, support for an annual research conference, and programs that expand the participation of underrepresented and disadvantaged groups in biomedical research. A Developmental Research Project Program provides competitive research funding that enhances success in biomedical research at PUIs. A Data Science Core provides cloud computing resources, training modules, and workshops, all designed to enhance research skills for PUI faculty and students. A Research Technology Core manages a Core Facility voucher program that allows PUI faculty and student researchers to access core facilities located at UAMS, UAF, and ACRI. Through further enhancement of research infrastructure, particularly at undergraduate institutions, the Arkansas INBRE continues to improve the ability of academic researchers to make discoveries that improve human health, increase the number of undergraduate students who choose careers in biomedical research, and stimulate the growth of biomedical research in Arkansas.

The EPSCoR/IDeA Programs: Closing the Funding Gap in the US

Lawrence Cornett, Ph.D.

The EPSCoR (Experimental/Established Program to Stimulate Competitive Research) and IDeA (Institutional Development Award) programs were established by Congress to address geographic disparities in research funding within the United States. Currently, the National Science Foundation (NSF), Department of Defense (DOD), Department of Energy (DOE), National Aeronautics and Space Administration (NASA), and the United States Department of Agriculture (USDA) administer EPSCoR programs that strengthen research capacity in states that historically receive a smaller share of federal research funding. The IDeA program is the National Institutes of Health's (NIH) version of EPSCoR and is designed to enhance biomedical research infrastructure in the 23 states, including Arkansas, and Puerto Rico. Currently, funding from the IDeA program to institutions in Arkansas totals $16.6 million. Arkansas has 8 active Centers of Biomedical Research Excellence (COBRE), two IDeA co-funded NIH R15 grants, and the Arkansas IDeA Network of Biomedical Research Excellence. Together, in Arkansas these IDeA funded research programs expand biomedical research capacity, provide research training opportunities for students and faculty, and stimulate economic development.

Jerry Ware, Ph.D.
Professor & Associate Director of the INBRE, and
Director of the DRP Program
Physiology & Cell Biology, College of Medicine

Funding Biomedical Research within the Arkansas INBRE Network: The Developmental Research Project Program

Jerry Ware, Ph.D., Director, Developmental Research Project (DRP) Program, & Samantha Kendrick, Ph.D., PUI Liaison

The long-term impact of the Arkansas INBRE depends on our ability to enhance the research and educational environment for faculty and students across Arkansas to develop the next generation of independent investigators. The Developmental Research Project (DRP) Program plays a key role in expanding biomedical research by supporting research led by primarily undergraduate institution (PUI) faculty. The DRP Program increases opportunities for undergraduate students to participate in biomedical research with the aim of producing the next generation of biomedical researchers. To achieve its goals, the DRP Program offers 2 different Funding Opportunity Announcements (FOAs) and solicits proposals in support of awarding meritorious science. Proposals undergo a rigorous NIH-modeled review process including an opportunity to address reviewer concerns with a revised application. PUI faculty responding to the FOA are required to attend a grant-writing workshop, establish a mentee/mentor relationship, follow all appropriate compliance guidelines, and are encouraged to report significant findings in publications and scientific presentations. DRP Program leadership follow a grant "life cycle" model to aid PUI faculty in all pre-award through post-award activities. The efforts of the DRP Program enhance the biomedical research capacity of the PUIs in the Arkansas INBRE network, provide research opportunities for undergraduate students at their home institutions, and strengthen the science departments of each participating PUI.

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Eric Enemark, Ph.D.
Associate Professor
Director of the Research Technology Core
Biochemistry & Molecular Biology
College of Medicine

Arkansas INBRE Research Technology Core

Rahul Jaiswal[1,2], Amit Ketkar[2], Kalyan Ghatak[2], Kalyani Dhusia[1], Eric J. Enemark[1,2]

[1]Arkansas INBRE Research Technology Core
[2]Center for Molecular Interactions in Cancer COBRE

The goals of the Arkansas INBRE Research Technology Core are to provide faculty and students of primarily undergraduate institutions (PUIs) with access to and education/training in the use of state-of-the-art core facility resources in Arkansas. These goals are accomplished with three programs: 1) the Core Facility Voucher Program enables access to state-of-the-art core facilities in Arkansas; 2) the Core Facility Education Program provides educational resources for Arkansas undergraduate institutions; and 3) the Emerging Technologies Program supports research at Arkansas INBRE network institutions in new cutting-edge approaches. The Core Facility Voucher Program supports use of core facilities by faculty and student researchers at PUIs and uses established core facilities at the University of Arkansas for Medical Sciences and the University of Arkansas at Fayetteville. The Core Facility Education Program provides students and faculty at PUIs educational opportunities in state-of-the-art use of core facility services to support ongoing and future research. The Emerging Technologies Program is working with the Structural Biology Core of the Center for Molecular Interactions in Cancer (CMIC) COBRE to establish a Structural Biology Shared Resource that enables education, training, and research at PUIs in Arkansas and across the Southeast IDeA states.

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Christopher Wardell, Ph.D.
Associate Professor
Director of the Data Science Core
Biomedical Informatics, College of Medicine

Arkansas INBRE Data Science Core

Christopher Wardell, Ph.D., Data Science (Bioinformatics) Core Director
Galina Glazko, Ph.D. , UAMS, Dept of Biomedical Informatics
Yasir Rahmatallah, Ph.D. , UAMS, Dept of Biomedical Informatics
Kalyani Dhusia, Ph.D. , UAMS, Dept of Biochemistry

Data science is a rapidly evolving and highly interdisciplinary subject which uses computational methods to extract knowledge from data. The Data Science Core exists to support biomedical researchers in Arkansas by supplying assistance in a range of areas related to Data Science. This includes all aspects of classical bioinformatics as well as recent developments in machine learning and artificial intelligence. We can provide help with experimental design, data analysis, manuscript and grant preparation, computational support, and educational workshops. In the past decade, we have had a broad impact, working with researchers throughout Arkansas to complete ~150 requests, contributing to an average of 2.7 publications per year. Our experienced staff of researchers is largely drawn from the UAMS Department of Biomedical Informatics and will be happy to discuss your project.

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Feng Wang, Ph.D.
Scharlau Endowed Professor & Distinguished Professor, & Director of the Outreach Core
Chemistry & Biochemistry

Building a Biomedical Research Pipeline in Arkansas: The INBRE Undergraduate Research Conference

Feng Wang, Ph.D., Outreach Core Director
Diane McKinstry, BBA, Outreach Program Manager

The Arkansas INBRE Outreach Core aims to engage and attract students from Primarily Undergraduate Institutions (PUIs) to participate in biomedical research. A key mechanism for achieving this goal is our annual statewide research conference, which provides a forum for networking, mentorship, and showcasing undergraduate research. Since 2002, the conference has brought together over 9,000 students and faculty, making it Arkansas's most well-attended conference focused on biomedical research. The conference features keynote speakers, student presentations, and career workshops, providing a unique opportunity for undergraduate students to share their research and learn about career opportunities in the biomedical sciences. With over 400-500 attendees annually, this conference is a crucial component of our efforts to build a strong biomedical research pipeline in Arkansas. We will showcase the impact and outcomes of this conference, highlighting its role in increasing graduate school enrollment and providing a transformative experience for undergraduate students considering careers in biomedical research.

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Diane McKinstry, BBA
Student Programs Manager
Physiology & Cell Biology, College of Medicine

Providing Opportunities for Undergraduate Students to Participate in Biomedical Research

Feng Wang, Ph.D., Outreach Core Director
Diane McKinstry, BBA, Outreach Program Manager

Through its Student Research Program, the Arkansas INBRE provides opportunities for students to participate in research via the Summer Research Program and the DRP Program. The Summer Research Program is a 10-week experience in cutting-edge biomedical research that takes place at the lead institutions, UAMS and UAF. In addition to participating in a biomedical research project led by a UAMS or UAF faculty member, through workshops and seminars, the students receive training in career-building skills and are exposed to specialized research techniques. Additionally, primarily undergraduate faculty who receive either research project or pilot grants through the DRP Program are required to engage undergraduate students in their research. Undergraduate students who participate in the Arkansas INBRE Student Research Program are invited to present their research findings at either the Annual Arkansas Undergraduate Summer Symposium or the Arkansas INBRE Fall Research Conference.

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Noureen Siraj, Ph.D.
Associate Professor & INBRE Project Leader
Department of Chemistry, UALR

Robert Griffin, Ph.D.
Professor & INBRE Mentor
Radiation Oncology, College of Medicine
UAMS

Emerging Ionic Nanomedicines from Synthesis and Characterization to in Vitro and in Vivo Performance

Ionic liquids (molten salts with melting points below 100 °C) have been extensively explored over the past two decades due to their remarkable physicochemical properties and broad range of applications. Recently, *frozen ionic materials* (solid at room temperature) have attracted significant attention owing to their ability to form stable nanoparticles. These *ionic nanomaterials* exhibit highly tunable properties that can be precisely controlled by varying counterions and tailoring their morphology.

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In this study, we report the synthesis and comprehensive characterization of ionic materials and their nanomaterial derivatives for biomedical applications. By rationally tuning both the cation and anion, ionic materials exhibiting dual toxicity mechanisms were developed. These materials were subsequently transformed into nanoparticles with controllable size, shape, and surface characteristics. Detailed photophysical investigations, including absorption and fluorescence spectroscopy, revealed enhanced therapeutic potential. Furthermore, cellular uptake, cytotoxicity, and endocytosis mechanisms of the ion-paired combination nanomedicines were examined. In vitro and in vivo studies demonstrated that the ionic nanomedicines outperformed their respective parent compounds, underscoring their promise as next-generation therapeutic platforms.

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Gregory R. Naumiec, Ph.D.
Associate Professor & INBRE Project Leader
Chemistry & Biochemistry
University of Central Arkansas

Tiffany Weinkopff, Ph.D.
Assistant Professor & INBRE Mentor
Microbiology & Immunology, College of Medicine
UAMS

N,N'-Disquaramides: A promising class of anti-leishmanial drugs against L. major

Leishmaniasis, the most prevalent neglected tropical disease and endemic in nearly 100 nations, has been designated a worldwide health crisis by the WHO. An increasing number of treatment failures with current pharmaceutics, as well as a lack of a vaccine, demonstrates the need to develop new treatment options for leishmaniasis. With the continued support from the Arkansas INBRE program, we have successfully synthesized and tested 24 disquaramide compounds targeting the *Leishmania major* parasite. Of the compounds that were evaluated, six of them demonstrated great promise for activity against *L. major* promastigotes (IC_{50} = 14–60 μM), demonstrating that disquaramides either impair parasite replication, or have leishmancidal effects, while also displaying no host cell cytotoxicity. These experiments provide evidence that disquaramides have the potential to be effective anti-leishmanial therapeutics.

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Research Support Teams

- **Biomed Buildings Research Space & Buildings Management**
- **BioVentures**
- **Division of Laboratory Animal Medicine (DLAM)**
- **Institutional Animal Care and Use Committee (IACUC)**
- **Institutional Review Board (IRB)**
- **Office of Research and Sponsored Programs (ORSP)**
- **Office of Research Regulatory Affairs (ORRA)**
- **Research Security**
- **Science Communication Group (SciCom)**

Contact Information

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