

UAMS

RESEARCH WINS

VOL. 2

2021-2022





Mission

The UAMS Division of Research & Innovation provides leadership in formulating and enacting strategies to expand research activities across UAMS. Our researchers are supported by the National Institutes of Health, Department of Defense, National Science Foundation, and other national and international agencies to better the health of Arkansans.

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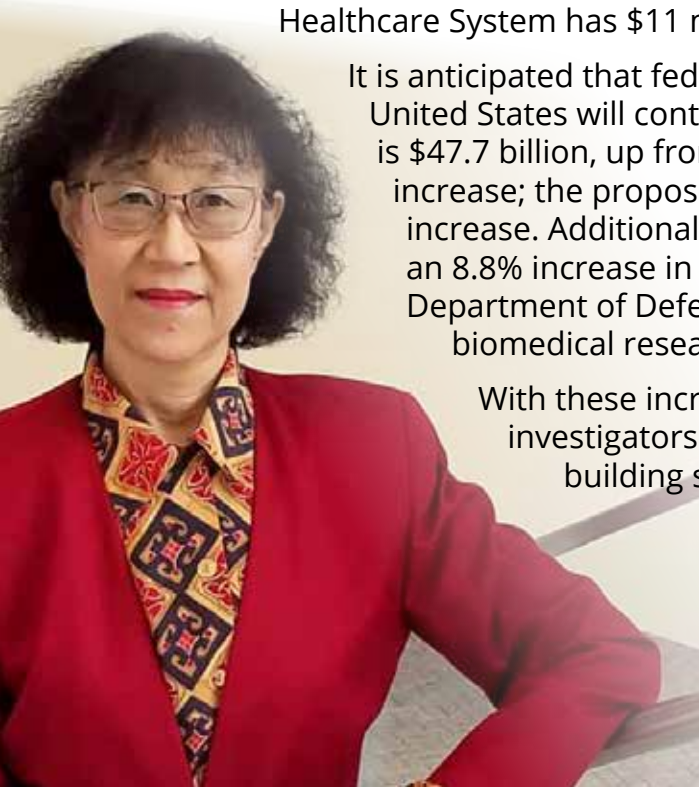
Vice Chancellor's Update

I continue to be impressed by the accomplishments of our investigators, who work tirelessly to generate new knowledge. Because of their work, UAMS continues toward achieving the goal of Vision 2029 to lead Arkansas to be the healthiest state in the region through its synergies of education, clinical care, research and purposeful leadership.

UAMS ranks sixth in funding received from the National Institutes of Health (NIH) among all institutions in the Institutional Development Award (IDeA) states. Extramural funding at UAMS increased by 14.5% in fiscal year 2022 (FY22), and NIH funding increased by an impressive 49% from FY20 to FY22.

UAMS has $158 million in total research funding (FY22), with $82 million from the NIH and $68 million from other federal agencies. Likewise, our affiliated institutions continue to expand their research endeavors: Arkansas Children's Research Institute has $34 million in total research funding (FY22), and the Central Arkansas Veterans Healthcare System has $11 million in total research funding (FY22).



It is anticipated that federal funding for biomedical research in the United States will continue to increase. The NIH budget for FY23 is $47.7 billion, up from $44.7 billion the previous year — a 6.7% increase; the proposed budget for FY24 is $51.1 billion — a 7.1% increase. Additionally, the National Science Foundation requested an 8.8% increase in funding to $40.9 million for FY24, and the Department of Defense will provide additional funding for biomedical research.

With these increases in funding, we are confident that our investigators will be able to expand their research efforts, building successful endeavors and ventures in their fields.

Shuk-Mei Ho, Ph.D.
Vice Chancellor of Research and Innovation

New Leaders

UAMS WELCOMED NEW LEADERS IN RESEARCH

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Mohamed O. Elasri, Ph.D., joined UAMS as the associate vice chancellor for Research and Innovation and a professor in the Department of Microbiology and Immunology. His research focuses on antibiotic resistance and biofilm formation in *Staphylococcus aureus*.

Kevin Sexton, M.D., was named president of BioVentures, LLC, the technology licensing office and business incubator based at UAMS. His unique perspective as a surgeon and entrepreneur helps UAMS inventors develop and commercialize new technologies.

John Imig, Ph.D., joined UAMS as the chair of the Department of Pharmaceutical Sciences in the College of Pharmacy. His research focuses on how fatty acids called eicosanoids affect kidney and cardiovascular function.

Susan Emmett, M.D., MPH, was recruited to UAMS to lead the new Center for Hearing Health Equity. She is an associate professor in the College of Medicine Department of Otolaryngology–Head and Neck Surgery and has a secondary appointment in the Fay W. Boozman College of Public Health.

Notable Grants

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Britni Ayers, Ph.D., received a two-year grant from the National Institutes of Health (NIH) to improve health outcomes for pregnant Marshallese women. The study will introduce the CenteringPregnancy® program, which gathers women in small peer groups to address health issues and receive care.

Alexei Basnakian, M.D., Ph.D., D.Sc., and **Shuk-Mei Ho, Ph.D.**, each received a Research Career Scientist award from the Department of Veterans Affairs to study the triggers of cell death and the origin of prostate cancer stem cells, respectively. This award recognizes the critical contributions the recipients make to Veteran health and disease research programs. They join their colleagues **Teresita Bellido, Ph.D.**, and **Robert Reis, Ph.D.**, as researchers in Arkansas with this prestigious national award.

Jon Blevins, Ph.D., received $2.4 million from the NIH to study *Borrelia turicatae*, a bacterium that causes tick-borne relapsing fever. Blevins also studies *Borrelia burgdorferi*, which causes Lyme disease.

The **Arkansas IDeA Network for Biomedical Research Excellence** (**INBRE**) received supplemental support from the NIH to purchase equipment and fund collaborative research projects between researchers at UAMS, the University of Arkansas at Fayetteville and the University of Central Arkansas. The Arkansas INBRE is led by **Lawrence Cornett, Ph.D.**; its mission is to expand and promote research activities at educational institutions across the state.

Hari Eswaran, Ph.D., was awarded an impressive three grants in six months by the NIH. The grants support research to develop noninvasive methods of diagnosing serious fetal health conditions.

J. Craig Forrest, Ph.D., received $1.25 million from the NIH to study how gammaherpesviruses and malaria parasites contribute to the development of lymphoma.

Shuk-Mei Ho, Ph.D., and **Yuet-Kin "Ricky" Leung, Ph.D.**, received over $2.5 million from the NIH to determine when common exposures to arsenic are most likely to cause infertility traits that can be passed to offspring over many generations. **Ho** also received $2.9 million from the **Department of Defense** to study adverse outcomes of exposure to open burn pits among Arkansas Veterans who served in the Middle East, as well as funding from the **National Science Foundation** to develop eco-friendly FUTURE sensors for toxic chemicals in human urine and the environment.

Brooke EE Montgomery, Ph.D., MPH, and **Nick Zaller, Ph.D.**, of the UAMS Fay W. Boozman College of Public Health's Southern Public Health and Criminal Justice Research Center received $4 million from the NIH to address the impact of structural racism and discrimination on the health of middle-aged Black men.

Rupak Pathak, Ph.D., received $3.4 million from the NIH to study radiation injuries, such as those caused by nuclear accidents or bioterrorism. His team aims to identify therapies to reduce the effects of radiation exposure, particularly on the heart and intestines.

Notable Grants

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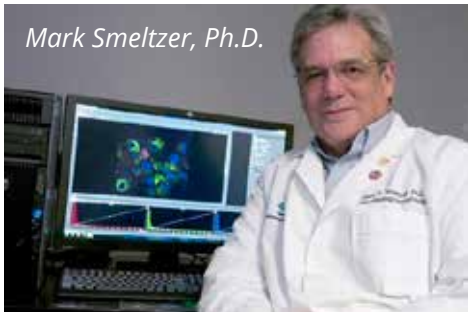

Mark Smeltzer, Ph.D.

UAMS received $5.7 million from the NIH to continue funding the **Center for Microbial Pathogenesis and Host Inflammatory Responses**, directed by **Mark Smeltzer, Ph.D.** This marks the third and final phase of funding provided by the Centers of Biomedical Research Excellence (COBRE) program. COBRE Centers help junior investigators establish independent research careers and support research within a specific scientific theme. UAMS proudly hosts two additional COBRE centers: **Center for Host Response to Cancer Therapy**, directed by Marjan Boerma, Ph.D., and **Center for Musculoskeletal Disease Research**, directed by Charles O'Brien, Ph.D.

Daniel Voth, Ph.D.

UAMS received $7.9 million from the NIH to renovate space for pandemic response and infectious disease research. **Daniel Voth, Ph.D.**, is leading the project, which will establish the Pandemic Response and Public Health Laboratory within Biomedical Research Center Building One.

Presented in alphabetical order by investigator's last name

Rising Stars

Clare Brown, Ph.D., MPH, received a K01 career-development award from the NIH's National Institute on Minority Health and Health Disparities to study the impact of race on adverse infant and maternal health outcomes. As part of the study, Brown will create algorithms that can be used to predict low-birthweight births.

Dina Jones, Ph.D., received a K01 career-development award from the NIH's National Institute on Drug Abuse to study barriers faced by African Americans trying to stop smoking menthol cigarettes. Jones is the first faculty member in the UAMS College of Public Health to receive this award.

Jennifer L. Vincenzo, Ph.D., MPH, PT, is the first UAMS researcher to be awarded the Paul B. Beeson Emerging Leaders Career Development Award in Aging. The award ($1 million over five years) will support implementation of a falls-prevention program as standard-of-care for older adults.

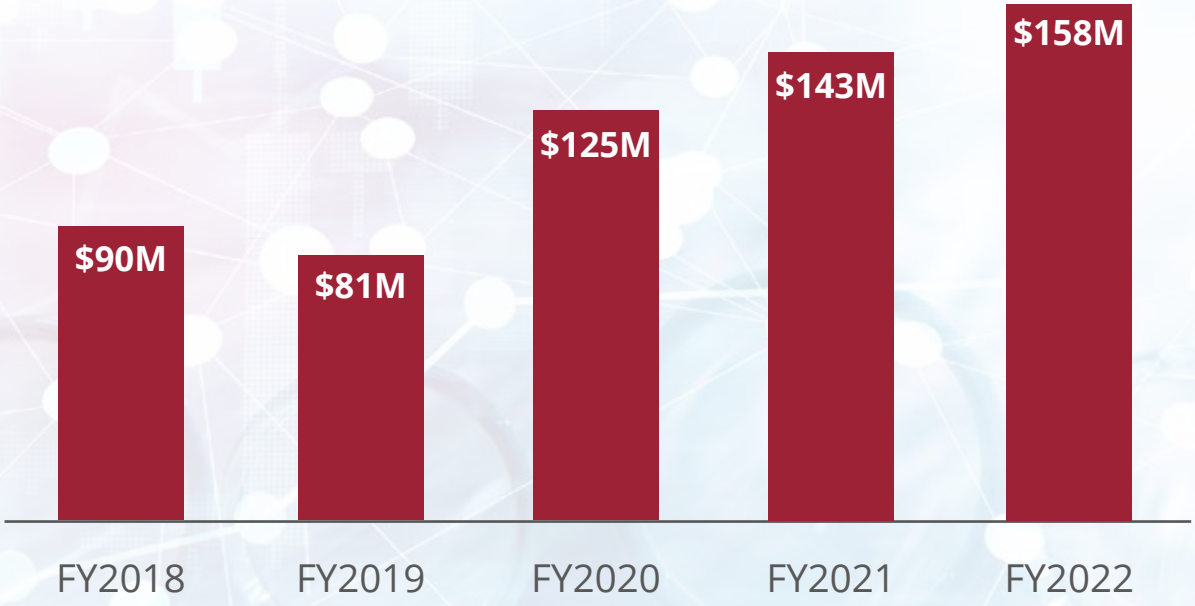
Presented in alphabetical order by last name

Research Funding

UAMS saw a 14.5% increase in research grant funding for FY2022.

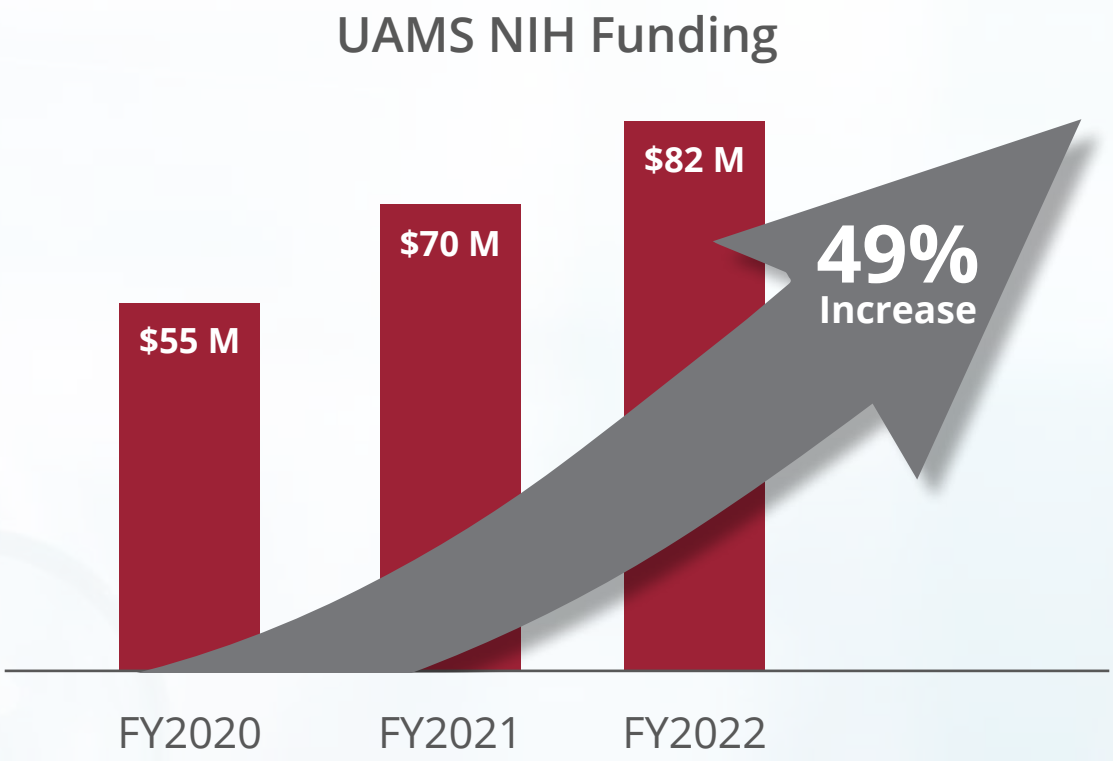
- Total funding reached **$158 million**, with $82 million from NIH and $68 million from other federal agencies, for a $15.1 million increase.
- The number of new grant awards increased by 25%.
- UAMS ranked **sixth in NIH funding** among all institutions in the Institutional Development Award (IDeA) states.

Total Extramural Funding at UAMS



UAMS Research Administrators processed 600 proposals, with 288 to NIH, in FY2022.

- Received more than 400 awards, totaling $158 million
- Processed 350 outgoing subawards, a 39% increase since FY2021



Research in Action

- **UAMS BioVentures** facilitated 46 invention disclosures, 36 new patent applications and 15 issued patents in FY2022. Of 46 spinoff companies, 33 remain in operation in FY2022. **Bolni Marius Nagalo, Ph.D.**, assistant professor in the Division of Experimental Pathology, is the lead inventor on a technology licensed to Nvirion BioTechnology, Inc., a Delaware company. The technology uses an engineered Jurona virus as an oncolytic virus platform to treat human cancers. The work was disclosed to BioVentures in 2021. This relationship and result highlight the service goals of BioVentures to help UAMS technologies reach the market as quickly as possible.

- More than 50 current and retired UAMS faculty were identified in a list of the **top 2% most influential researchers**. The list was generated by researchers at Stanford University and is based on an analysis of citations in the Scopus database.

- The UAMS **Institutional Review Board** (IRB) expanded its support into Northwest Arkansas under the leadership of director **Edith Paal, MSJourn, MPH, CIP, CHRC**. The UAMS IRB Northwest office supports a growing human subject research program in Northwest Arkansas.

  The UAMS IRB's median review and approval times outpaced those reported by other accredited academic medical centers, according to data from the Association for the Accreditation of Human Research Protection Programs (AAHRPP). The UAMS IRB delivered full board approval of human research protocols in **12 days versus 43.5 days** for other AAHRPP-accredited institutions (values are median number of calendar days between end of pre-review and full board approval).

- **Pearl McElfish, Ph.D., MBA**, and her team at the **UAMS Office of Community Health & Research** found that Hispanic and Marshallese people are more likely to receive a COVID-19 vaccine at a faith-based organization than at a clinic.

- The **Path 2 K** program offers junior investigators a structured approach to preparing and submitting an NIH Career Development (K) award proposal. The collaboration between the Winthrop P. Rockefeller Cancer Institute and the Translational Research Institute features four to six months of activities, including grant-writing and budget workshops, regular group meetings and individualized support.

- Postdoctoral researchers can find support in the newly established **PostDoc Academy**. The initiative was spearheaded by **Mohamed O. Elasri, Ph.D.**, associate vice chancellor for Research and Innovation. UAMS postdoctoral fellows are trainees as well as valued research colleagues. To optimize their career trajectories and experiences, the PostDoc Academy offers a variety of activities and resources focused on grant writing, constructing Individual Development Plans, and promoting peer-to-peer support and collaboration.

- UAMS investigators began the final phase of study toward commercializing the first **rapid diagnostic test for acetaminophen toxicity**. The inventors, led by Translational Research Institute Director **Laura James, M.D.**, received $3.2 million from the NIH to complete studies needed to seek Food and Drug Administration approval of the blood test.

- **Andres Cuadros-Menaca, Ph.D.**, and **Michael Thomsen, Ph.D.**, from the UAMS Fay W. Boozman College of Public Health, found that students had fewer behavior issues if their school provided breakfast after the school day began. Through the **Breakfast After the Bell** program, Arkansas students in grades 3-7 were served more than 1.3 million breakfasts during the 2018-2019 school year.

- Researchers led by **Joshua Kennedy, M.D.**, found that COVID-19 infection rates were higher among Black and Hispanic populations in Arkansas than white populations. Researchers measured the seroprevalence of antibodies to COVID-19, an indicator of past infection. This work was supported in part by the UAMS Translational Research Institute.

UAMS Research Academy

The UAMS Research Academy was instituted by the Division of Research and Innovation in early 2020. The Research Academy continues to host seminars aimed at enhancing the research community through targeted training. Recordings and materials are archived and made available to all UAMS investigators. A seminar series was presented by four directors of UAMS Centers of Biomedical Research Excellence and focused on grantsmanship:

Anatomy of an Impactful Specific Aims Page:
Mark Smeltzer, Ph.D.

How to Address Review Criteria in Your Research Strategy:
Marjan Boerma, Ph.D.

How Study Sections Review Your Proposal:
Alan Tackett, Ph.D.

How to Address Reviewers' Comments:
Charles O'Brien, Ph.D.

Excellence in Publishing

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UAMS graduate students published 92 manuscripts in 2021-2022

Graduate Programs	No. Publications
Bioinformatics	3
Biomedical Informatics	11
Clinical Nutrition	1
Clinical and Translational Sciences	6
Epidemiology	3
Graduate Program in Interdisciplinary Biomedical Sciences	
Biochemistry and Molecular Biology	15
Physiology and Cell Biology	7
Microbiology and Immunology	7
Neuroscience	8
Pathobiology	1
Pharmacology, Toxicology and Experimental Therapeutics	8
Health Promotion and Prevention Research	3
Health Systems and Services Research	2
M.D./Ph.D. program	1
Nursing Science	3
Pharmaceutical Evaluation and Policy	9
Pharmaceutical Sciences	4

UAMS researchers published more than 30 articles in **high-impact journals** in 2022. These journals include:

- *Nature Communications*
- *Science Translational Medicine*
- *Lancet*
- *Journal of the American College of Cardiology*
- *New England Journal of Medicine*
- *Journal of Clinical Investigation*
- *Journal of the American Medical Association*
- *Proceedings of the National Academy of Sciences*
- *Annals of Internal Medicine*

Karl Boehme, Ph.D., was recognized as one of the top 25 reviewers for the *Journal of Virology*, the premier virology journal. Top reviewers submitted reviews on time more than 90% of the time and accepted the invitation to review more than 60% of the time. Boehme is a professor in the Department of Microbiology and Immunology.

Research Collaborations

Four groups of researchers in the College of Medicine formed research "Creativity Hubs" toward developing collaborative, thematic research programs. The initiative was funded by the College of Medicine and the vice chancellor for Research and Innovation. The four inaugural Creativity Hubs are:

- **Neurodegenerative Diseases** — Co-led by Steven Barger, Ph.D., professor in the Department of Geriatrics, and Paul Drew, Ph.D., professor in the Department of Neurobiology and Developmental Sciences
- **Musculoskeletal Health and Disease** — Led by Teresita Bellido, Ph.D., professor and chair of the Department of Physiology and Cell Biology
- **Lifespan Research to Improve Cardiometabolic Health** — Led by Elisabet Borsheim, Ph.D., professor in the departments of Pediatrics and Geriatrics and associate director and research leader at the Arkansas Children's Nutrition Center
- **Artificial Intelligence (AI) for Health** — Led by Fred Prior, Ph.D., distinguished professor and chair of the Department of Biomedical Informatics

The University of Arkansas at Fayetteville and UAMS hosted the **Metabolism in Health and Disease Symposium** in Fayetteville in November 2021. The mission was to strengthen existing collaborations between biomedically focused researchers and facilitate new collaborations. Speakers included:

- **Mario Ferruzzi, Ph.D.,** professor, Pediatrics, UAMS
- **Kyle Quinn, Ph.D.,** associate professor, Biomedical Engineering, UA-Fayetteville
- **Marjan Boerma, Ph.D.,** professor, Pharmaceutical Sciences, UAMS
- **Shilpa Iyer, Ph.D.,** assistant professor, Biological Sciences, UA-Fayetteville
- **Robert Griffin, Ph.D.,** professor, Radiation Oncology, UAMS
- **Nicholas Greene, Ph.D.,** associate professor, Health, Human Performance and Recreation, UA-Fayetteville
- **Isabelle Racine-Miousse, Ph.D.,** assistant professor, Biochemistry and Molecular Biology, UAMS
- **Narasimhan Rajaram, Ph.D.,** associate professor, Biomedical Engineering, UA-Fayetteville

This publication highlights research excellence at UAMS and affiliate institutions. It does not include a complete list of grants awarded, publications or new faculty. For more information, contact klevans@uams.edu.

UAMS

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