UAMS News Bureau

Office of Communications & Marketing
4301 West Markham # 890
Little Rock, AR 72205-7199

uamshealth.com/news

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Media Contacts:
Leslie W. Taylor, 501-686-8998
Wireless phone: 501-951-7260
leslie@uams.edu

Yavonda Chase, 501-686-8994
Wireless phone: 501-416-0354
yavonda@uams.edu

UAMS' Mitch McGill, Ph.D., Leads $1.6 Million Project Examining Liver Repair

LITTLE ROCK — Mitch McGill, Ph.D., has received a $1.64 million grant to examine the fundamental molecular mechanisms of liver repair.

McGill, an associate professor in the University of Arkansas for Medical Sciences (UAMS) Fay W. Boozman College of Public Health Department of Environmental Health Sciences, is leading the study, "The Role of Phosphatidic Acid in Liver Regeneration after Acetaminophen Overdose."

The research team includes D. Keith Williams, Ph.D., MPH, professor of biostatistics, who serves as co-investigator. Other important personnel include Andrew J. Morris, Ph.D., professor in the College of Medicine Department of Pharmacology and research career scientist at the Central Arkansas VA Healthcare System, and Brian N. Finck, Ph.D., professor at Washington University in St. Louis, both of whom serve as collaborators.

The National Institutes of Health's National Institute of Diabetes and Digestive and Kidney Diseases is funding the project, which launched in March and will continue through February 2029.

According to McGill, acute liver failure most commonly results from overdose of the drug acetaminophen. The research team will aim to understand how phosphatidic acid activates, or promotes, liver repair after acetaminophen-induced liver injury. They're hopeful that the research will lead to new drugs that mirror the effects of phosphatidic acid to promote the natural repair process to improve transplant-free survival in acute liver failure. However, to achieve their goals, they must first gain a better understanding of the fundamental molecular processes underlying liver repair.

"Acute liver failure is a rare, devastating condition with strikingly high mortality," McGill said. "Currently, the only life-saving treatment is a liver transplant. But there's a shortage of healthy donor livers, which is a major public health problem. Even those patients who receive a liver transplant, risk numerous life-threatening complications such

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as organ rejection. We want to develop new treatments to help acute liver failure patients.

"The specific focus of this project is determining how a molecule in the liver called phosphatidic acid inhibits an enzyme that normally blocks regeneration."

McGill's previous research has revealed that the lipid phosphatidic acid may enhance liver regeneration. He's optimistic that the team can develop info that will help the medical community understand molecular mechanisms of liver repair and how the lipid helps with acute liver failure.

"No other organ in the human body has the same capacity for self-repair," McGill said. "If we can understand how it repairs itself, then we can create new therapeutics that will kick that process into high gear and improve transplant-free survival in those patients whose livers are not naturally so good at it, or who have such severe injury that the liver needs a little help to start the repair process.

"We want to help acute liver failure patients. Furthermore, some of the lessons we'll learn from this project will likely be applicable to liver failure caused by other conditions, like fatty liver — a rapidly growing problem in Arkansas."

UAMS is the state's only health sciences university, with colleges of Medicine, Nursing, Pharmacy, Health Professions and Public Health; a graduate school; a hospital; a main campus in Little Rock; a Northwest Arkansas regional campus in Fayetteville; a statewide network of regional campuses; and eight institutes: the Winthrop P. Rockefeller Cancer Institute, Jackson T. Stephens Spine & Neurosciences Institute, Harvey & Bernice Jones Eye Institute, Psychiatric Research Institute, Donald W. Reynolds Institute on Aging, Translational Research Institute, Institute for Digital Health & Innovation and the Institute for Community Health Innovation. UAMS includes UAMS Health, a statewide health system that encompasses all of UAMS' clinical enterprise. UAMS is the only adult Level 1 trauma center in the state. UAMS has 3,275 students, 890 medical residents and fellows, and five dental residents. It is the state's largest public employer with more than 12,000 employees, including 1,200 physicians who provide care to patients at UAMS, its regional campuses, Arkansas Children's, the VA Medical Center and Baptist Health. Visit www.uams.edu or www.uamshealth.com. Find us on Facebook, X (formerly Twitter), YouTube or Instagram.

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