

Arkansas
Research
Alliance (ARA):
Overview

**Prepared for the
Joint Meeting of
the House and
Senate Education
Committees**

**1:30 p.m., October 4, 2021
Big MAC-A**



Questions relevant to Arkansas that the ARA Academy members are working on...

1. How to grow bone to replace damage from war time injury?
2. How to understand childhood brain development and effects from childhood trauma?
3. How to sustain/increase rice yields with higher night time temperature?
4. How to increase the safety and efficiency of high speed conveyor systems for Amazon and FedEx?
5. How to improve/grow a stronger catfish industry in Arkansas?

Who we are

- Public-private partnership founded in 2008 from vision of Accelerate Arkansas
- Economic development organization focused on using university research to increase the competitive future of Arkansas
 - Talent, Focus, Collaboration, and Results
- Strong Board of Trustees
- 14th year of operation: small and agile team

What we do

Recruit and retain strategic university research leaders

Focus and elevate their collaboration and impact

Partner with the **state's 5 main research universities** that represent **over 90%** of the federal research dollars that flow into the state:

- University of Arkansas
- University of Arkansas for Medical Sciences
- Arkansas State University
- University of Arkansas at Little Rock
- University of Arkansas at Pine Bluff

Manage a strategic collaboration with the state's largest federal lab: **U.S. FDA National Center for Toxicological Research**

ARA Board of Trustees

University Chancellors

Laurence Alexander – UAPB

Kelly Damphousse – A-State

Cam Patterson – UAMS

Corporate Members

Sonja Hubbard – The Yates Group (Chair)

Ritter Arnold – E. Ritter and Company

Chris Barber – St. Bernards Healthcare

Curtis Barnett – AR Blue Cross Blue Shield

Daryl Brown – MISO

Marty Casteel – Simmons Bank

Andrew Clyde – Murphy USA

Ronnie Dedman – AT&T Arkansas

Jerry Jones – LiveRamp

Christina Drale – UA Little Rock

Charles Robinson – UA

Laura Landreaux – Entergy

Charles Nabholz – Nabholz Group

David Peacock – Hytrol

Tracy Rosser – Transplace

Reynie Rutledge – First Security

Barbara Sugg – Southwest Power Pool

Mary Ward – Acxiom

Dan Williams – Garver

Michelle Wolfe – Walmart

ARA Board of Trustees: Previous Members

Previous members include [14](#) chancellors of Arkansas research universities and [27](#) corporate leaders:

University Chancellors

Joel Anderson – *UA Little Rock*
Lawrence Davis – *UAPB*
Dan Ferritor – *UA*
Stephanie Gardner – *UAMS*
David Gearhart – *UA*
Dan Howard – *A-State*
Tim Hudson – *A-State*
Robert Potts – *A-State*
Daniel Rahn – *UAMS*
Andrew Rogerson – *UA Little Rock*
Joe Steinmetz – *UA*
Dodd Wilson – *UAMS*
Calvin Johnson – *UAPB*
Doug Whitlock – *A-State*

Corporate

Dick Bond – *Tyson*
Bruce Burrow – *MBC Holdings*
Hal Carper – *Tyson*
Steven Cosse' – *Murphy Oil*
Kristi Crum – *Verizon*
Claiborne Deming – *C.P. Deming Co.*
Ray Dillon – *Deltic Timber*
Ed Drilling – *AT&T*
Kent Fonvielle – *MISO*
Scott Ford – *Westrock Capital*
Jeff Gardner – *Windstream*
Todd Hillman – *MISO*
Roger Jenkins – *Murphy Oil Corp*
Marla Johnson-Norris – *Aristotle*

Corporate

Carol Johnston – *Walmart*
Gaylon Lawrence – *The Lawrence Group*
Alex Lostetter – *Cree*
Drew May – *Acxiom*
Tommy May – *Simmons First Foundation*
Hugh McDonald – *Entergy*
Rick Riley – *Entergy*
John Roberts – *J. B. Hunt*
Bob Shoptaw – *AR Blue Cross Blue Shield*
Stephen Smith – *Verizon*
Kirk Thompson – *J. B. Hunt*
Dean Taylor – *Verizon*
Rick Webb – *Walmart*

In total, there have been [56 members](#) of the ARA Board of Trustees: [19](#) chancellors and [45](#) corporate leaders.



How we do it

Programs to recruit, retain, recognize top research talent

- ARA Scholars
- ARA Fellows
- ARA Academy of Scholars and Fellows
- ARA Impact Grants
- ARA Core Facilities Exchange
- Arkansas Voices 4 Research: *AMP Discovery Economics* + Project Scope

Why is what we do important to the state

- Recruiting and retaining research talent
- Increasing collaboration between institutions/researchers
- Supporting important organizations such as NCTR

Impact of increased research in Arkansas

ARA Academy: Federal Grants Snapshot (2020)

- # of active federal grants: **123**
- \$-value of active federal grants: **\$73,633,540**

ARA Impact Grants Pilot (2019): \$1M across 15 projects has led to **\$13M** in federal follow-on funding

- \$36M in the proposal pipeline
- Round 2 (2021) of \$1M underway

FDA research contracts: \$5M



Meet the ARA Academy

Since its launch in 2015, the [ARA Academy of Scholars and Fellows](#) has grown to **32 active members** from **five research universities** and the **National Center for Toxicological Research (NCTR)**.



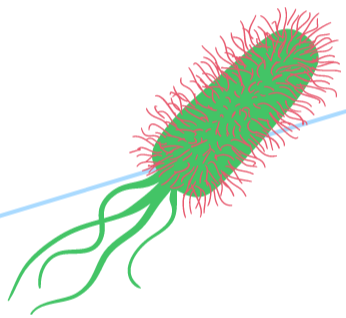


Nushores Biosciences developed a scaffolding that promotes the growth of artificial bone.

There is no satisfactory solution for major bone injuries caused by accidents, warfare and cancer.



But a new challenge remained: how to prevent catastrophic bacterial bone infections.



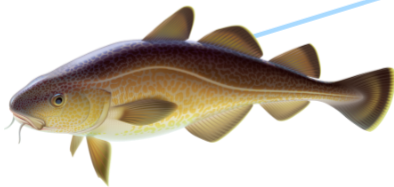
ARA Fellows Dr. Alex Biris (UA Little Rock) and Dr. Mark Smeltzer (UAMS) collaborated to develop a system that infuses antimicrobial properties into the artificial bone, preventing life-threatening infections.

Research results show that NuShores' NuCress™ scaffold could offer a number of benefits that to date not achieved by currently marketed bone regeneration products, therefore promising to bring better treatment outcomes to millions of people with severe bone injuries. NuShores has the exclusive, global license from University of Arkansas Little Rock to commercialize university-owned patented and patent-pending bone regeneration technologies.



UNIVERSITY
of ARKANSAS
AT PINE BLUFF
1873

Catfish farming is big business in Arkansas.



But foreign competition is flooding the market with cheap fish.



\$55M in sales, 1998



\$28M in sales, 2013



UAPB professor and ARA Fellow Dr. Rebecca Lochmann is recharging Arkansas' catfish industry by engineering healthier fish.

Dr. Rebecca Lochmann's research centers on improving fish performance and production by discovering a comprehensive approach to assessing dietary iron utilization in channel catfish-fed, plant-based diets.



Problem: more electronics means more heat, which means more weight to cool the systems.



The international company wants its heavy-machinery to rely more on clean energy electrical systems.

Caterpillar has a major manufacturing presence in Arkansas.



ARA Fellow Dr. Alan Mantooth of the University of Arkansas is developing a 2-by-250 kilowatt, dual-power inverter system for use in the electrification of heavy equipment and other, higher-volume transportation vehicles, such as trucks and buses.



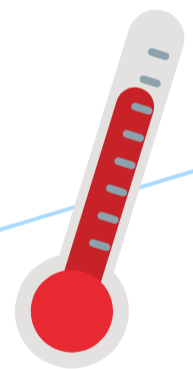
Dr. Mantooth holds the Twenty-First Century Research Leadership Chair in electrical engineering. He serves as executive director of the Department of Energy-funded Cybersecurity Center for Secure Evolvable Energy Delivery Systems and the National Science Foundation-funded GRid-connected Advanced Power Electronic Systems. He is an IEEE Fellow, has served on the IEEE Power Electronics Society Advisory Committee since 2004.



In Arkansas, rice is a \$600M industry. Our state is the nation's leading rice producer.



Climate change has increased Arkansas' nighttime temperature by 0.5°C, threatening yields.



Not only is our state's rice production threatened, so is the world's food security.



ARA Fellow Dr. Argelia Lorence of Arkansas State University leads a team researching ways to make rice more resistant to rising nighttime temperatures.

As a professor of metabolic engineering at Arkansas State University, Dr. Lorence has devoted her life to equipping farmers with the latest tools and technologies to maximize their yields and adapt to changing growing conditions.

Collaborative Research Impact

- Each year, 215,000 Americans are diagnosed with lung cancer. The epidemic is especially burdensome to Arkansas with death rates far higher than the national average.
- A lung biopsy – an invasive procedure needed to diagnose lung cancer – is uncomfortable, risky for the patient, and expensive. But promising research conducted by in-state institutions is changing the game.
- **Arkansas Research Alliance** organized and leads a team of researchers who are breathtakingly close to developing a liquid biopsy for diagnosing and treating lung cancer with precision medicine.
- Fueled by close to \$3 million in contracted funding from the FDA's National Center for Toxicological Research, the team harnesses collaboration between UAMS, UA Little Rock, UAPB, UA, and A-State.

Summary

1. Who we are...
2. What we do...
3. How we do it...
4. Why it's important to Arkansas...
5. Share examples of research.

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CHANGING THE ARKANSAS ECONOMY THROUGH RESEARCH

BY JERRY ADAMS

I'd like to think that my 46 years of experience in the Arkansas business community has provided me with valuable insights. My 34 years at Acxiom were exceptional. I arrived in 1973 with around 20 employees at the company, which was an exciting return to my native state. I saw firsthand how innovation, hard work and a level of confident risk-taking can drive business success. Acxiom exported clear business value to their customers. In return, it brought back to the state strong economic value. When I retired from Acxiom in 2007, we had more than 7,000 employees with revenue approaching \$1.5 billion.

My second career had its roots with my involvement in Accelerate Arkansas. It started with a phone call in 1999 from Jim Pickens, the head of what was then called the Arkansas Industrial Development Commission. He invited me to join a task force he was creating to examine how Arkansas could participate in the knowledge economy, or more specifically, "How could Arkansas recruit knowledge-based companies to Arkansas." The task force was headed by James Hendren, who has been instrumental in my maturity with understanding technology-based economic development.

The core leadership involved in the taskforce stayed together to create Accelerate Arkansas, a nonprofit focused on policy and vision for Arkansas' knowledge-based economy. Armed with a 2004 study titled, "Arkansas' Position in the Knowledge-Based Economy," written by Ross DeVol, then the chief economist for the Milken Institute, we started to dig in. Ross' report admitted that "Arkansas has been operating at the periphery of the knowledge-based economy" — painful to hear, but true.

My second career leading the Arkansas Research Alliance (ARA) for the last 12 years has broadened my perspective of what role univer-



Jerry Adams

sity research should play in the economic future of our state. The 2007 Strategic Plan authored by Accelerate Arkansas identified five core strategies to develop the state's business and technological competitiveness. One of those strategies focused on how university research should change the economic trajectory of our state. Using the Georgia Research Alliance as a model, ARA officially started in April 2008, and we haven't looked back. ARA, from the beginning, has had a strong board of trustees comprised of the chancellors from the five leading research universities in Arkansas plus corporate members of the board now numbering 16 — strong and strategic. The ARA website is up to date and provides great insight to our progress.

All of this is foundation for what we have ahead: an exciting future based on innovation, computational competence and an understanding of how Arkansas can compete in the 21st century. Already, the seeds we have planted are yielding fruit. Founded in 2016, the ARA Academy of Scholars & Fellows — comprised of chancellor-identified scientific talent core to the strategic success of each of the state's major research campuses — is rapidly building essential relationships to Arkansas' private sector and national organizations. It's all fueled by support from federal and state resources and is helping us transition to a competitive tech-based innovation economy. Today, we are among the nation's leaders in artificial intelligence, drug discovery, medical innovation, cybersecurity and more.

So, moving forward, we'll be sharing with the readers of *AMP* a monthly dose of the elements of the necessary building blocks for the competitive future of Arkansas as it relates to innovation, university research and creating value by solving complex business challenges — story by story. **A**

Jerry Adams is the president and CEO of the Arkansas Research Alliance, based in Conway. ARAlliance.org

WALKING THE HALLS OF ARKANSAS RESEARCH INSTITUTIONS

By Bryan Barnhouse

Raise your hand if you regularly get to walk the halls of the research universities in Arkansas.

Most of us are probably still holding onto our tablets (or the edges of this magazine). There are really important things going on in those halls and labs that you need to know about. This is why, for the last several months, this space has featured a Q&A segment with university-based scientists and engineers who are shaping the future of our state and nation.

Discovery Economics connects us to some of the state's most talented research visionaries. It shines a spotlight on their innovation and the implications of the scientific advancements coming from our universities and federal lab. The research topics stretch across the strategic interests of multiple economic, social and geographic sectors.

The benefits accruing to the state take several forms too, from the macro to the direct. In the big picture sense, these researchers provide better visibility for the state as a player in the knowledge economy. It also helps ensure that Arkansas has a workforce prepared for the jobs of the future. In the direct sense, research results lead to new products and services, which become new companies and jobs.

Each of the researchers profiled in *Discovery Economics* is a member of the Arkansas Research Alliance (ARA) Academy of Scholars and Fellows. ARA was founded in 2008 as a public-private partnership to advance job-creating research in Arkansas, primarily through the recruitment, retention and recognition of world-class talent.

In partnership with university chancellors, ARA Scholars are recruited from outside the state and ARA Fellows already reside at one of the ARA member-universities and are recognized for their achievements. The ARA Academy draws this group together into a community of research leaders. There are currently 32 members with more on the way.

LET'S RECAP THE WORK OF SOME OF THE SCIENTIFIC RESEARCH LUMINARIES WHO HAVE BEEN COVERED SO FAR.

- Battling cardiovascular disease – the No. 1 killer worldwide and devastating for Arkansas — through engineered improvements to the performance and durability of heart valves (Morten Jensen, University of Arkansas).
- Expanding participation in research, where it becomes a routine part of everyday life, to meet health challenges of Arkansans, especially those in rural areas (Laura James, University of Arkansas for Medical Sciences).
- Enhancing human productivity by building artificial intelligence (AI) techniques that span industries (Xiuzhen Huang, Arkansas State University).
- Improving ingredients that comprise the diet of the nation's top food-fish (catfish) to make it safer and healthier (Rebecca Lochmann, University of Arkansas at Pine Bluff).
- Combating cyber misinformation with big data analytical tools and training (Nitin Agarwal, UA Little Rock).
- Creating the very best power electronic equipment coupled with leading cybersecurity (Alan Mantooth, UA).
- Imaging human brains to understand the organization of information processes so that therapies can be designed to better treat depression, dementia, addiction and suicide and alleviate the suffering, death and lost potential and productivity associated with them (Clint Kiltz, UAMS).
- Developing non-chemical, nano-engineering approaches to sanitize metals in industrial processes (Tansel Karabacak, UA Little Rock).

These are just for starters. There are countless discoveries underway. We hope to give a preview of what's to come in the next column.

By virtue of this column, we are trying to let you walk in our shoes and equip you with the people and stories of how university research is transforming and touching our lives, the lives of every Arkansan. We hope you will share this vision for the research future of Arkansas. It needs true believers and champions like you. Thanks for “walking the halls” with us.

Bryan Barnhouse is CEO of the Arkansas Research Alliance. Before joining ARA, he worked with the Economic Development Alliance of Jefferson County and the Arkansas Economic Development Commission. **S**



Bryan Barnhouse

THE “WHAT IFS” OF SCIENTIFIC RESEARCH

By Bryan Barnhouse

My dad suffered a massive stroke two months after this picture was taken. Eighteen months later, he walked unassisted across a room for the first time. Despite reclaiming some abilities, his cognition, communication and motor skills will never be what they once were. Don't get the wrong idea; he is by no means helpless. He is still a card shark who will rob you blind.

Ironically, after I became CEO of the Arkansas Research Alliance (ARA), a public-private partnership founded in 2008 that invests in research that stimulates innovation, encourages collaboration and strengthens economic opportunity, a proposal for a research project came across my desk. The proposal was from a couple of the members of the ARA Academy of Scholars and Fellows — strategic, scientific leaders selected to the ARA Academy by the chancellors of Arkansas research universities. The researchers were seeking ARA Impact Grant funds to design, prove and scale-up a blood-clot removal device. It could not help but make me wonder, “What if?”

The ARA Impact Grant program was created as a pilot to accelerate research discovery and development. The process takes years and big-time money to bring a medical product to the bedside. The traditional federal agencies (such as the National Science Foundation and National Institutes of Health) that provide major grants to aid this process require preliminary research data before they will even consider backing a project. Obtaining that data takes funding. Sounds like a catch-22.

Enter ARA Impact Grants. These are targeted, 12-month projects between \$25,000 and \$75,000. Academy members use them to generate preliminary data that better position them to compete for larger research grants.



Bryan Barnhouse and his dad, Michael Barnhouse.

They are paying off, too. The pilot round invested \$1 million across 15 projects, which included the blood-clot removal device. There was a 60/40 funding split between ARA and the researcher's host institution. Despite pandemic delays and with about 60 percent of the projects reporting, they have returned close to \$13 million in follow-up federal funding. The program proved so effective that ARA launched a second round of roughly the same scale this past March. It is energizing the ARA Academy researchers and seeks to validate the pilot round. Looking ahead, Impact Grants have the potential to be central to the future of research in Arkansas.

What if, heaven forbid, you or a loved one were one of the 795,000 people who experience a new or recurrent stroke annually? What if that stroke fell into the 87 percent of strokes caused by a mass or blood clot in an

artery of the brain? Considering Arkansas and our surrounding states host the highest death rate from cardiovascular disease, the odds are not in our favor. But, what if all this research and development on the blood clot dissolving device started 10 years ago? Then maybe the odds would be more in our favor.

This is why ARA wants to bring these research leaders to you through this Discovery Economics column. Over the next several months, we want you to imagine the “what ifs” with us. We will present you with another sampling of Academy members. These five-star researchers leave no stone unturned when it comes to the Arkansas economy. They are leading the fight in helping agricultural production withstand higher night-time temperatures (Argelia Lorence, Arkansas State University), forging new applications for artificial intelligence in the food supply chain (Justin Zhan, University of Arkansas), preventing bacterial infection during and after surgery (Mark Smeltzer, University of Arkansas for Medical Sciences) and helping the U.S. Food and Drug Administration keep our bodies and food sources safe (Steve Foley, National Center for Toxicological Research).

Other surprises are in store. We will be treated to the musings of Douglas Hutchings, director of the ARA Academy. We also plan to unveil a new research tool designed to leverage the presence of high-end research instrumentation here in the state. Please continue to check this space each month as we imagine together, “What if.”

Bryan Barnhouse is CEO of the Arkansas Research Alliance. Before joining ARA, he worked with the Economic Development Alliance of Jefferson County and the Arkansas Economic Development Commission. 