

## ***Announcements***

### **IDeA National Resource Summer Internships for Undergraduate Students in Proteomics**

These Proteomics internships are designed for students with a solid background in science who wish to know about translational research, scientific work in the laboratory that translates to direct patient care. This internship will provide experience in Proteomic and/or Bioinformatic Sciences and is designed to encourage pursuing a career in biomedical research.

Please follow the [link](#) for more information.

**Program Dates: May 23-July 29, 2022**

**Application deadline: March 2, 2022**

### **UALR & UAMS Genomics Workshop**

**March 21 – 23, 2022 (UA System Spring Break Week)**

UALR and UAMS are pleased to host a Genomics Workshop with both face-to-face and virtual options. Students will gain experience analyzing data using 3<sup>rd</sup> generation sequencing methods. This workshop is free and open to all interested high school, college, graduate students and faculty.

**Please register using the following link:** <https://www.surveymonkey.com/r/PFTGL77>.

### **INBRE Summer Mentored Research Program**

**SAVE-THE-DATE: May 23 – July 29, 2022**

**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](#).

Fellowship opportunities are available through NIH for students and postdocs from underrepresented populations. For more information, visit the [iCURE website](#).

NIH's #COVID [website](#).

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## ***Upcoming Meetings***

### **INBRE Grant Writing Workshop**

**Friday, February 11, 2022**

**1:30-4 PM**

Please remember that attending a workshop is a required pre-requisite to submitting a research grant to the INBRE. Registration is required.

**[Grant Writing Workshop Registration Link](#)**

### **INBRE Obesity and Diabetes Research Workshop for Undergraduates**

**SAVE-THE-DATE: May 25, 2022, 9 AM – 2 PM**

This workshop will help students understand the role of research in contributing to the development of evidence based methods for prevention and treatments for obesity and diabetes. The workshop is free and limited to 30 students. It will be held in-person on the UAMS campus in the Active Learning Center. Registration is required.

**[Registration Link](#)**

### **2022 NISBRE Conference**

Will be held virtually. More details to come.

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## Message from the PI



Back in early December, I was asked to participate on a panel as part of a NIH webinar announcing a Notice of Special Interest entitled “Availability of Administrative Supplements to INBRE Awards to Fund Research Collaborations”. Wanting to not embarrass myself in front of a national audience and the NIH officials who organized the webinar, I spent some time reviewing literature on what makes a collaborative endeavor successful.

Starting with the basics, I found the definition for “collaboration” in the New Oxford American Dictionary—the action of working with someone to produce or create something. However, it turns out there is an alternate definition for collaboration that is attributed to a native Arkansan. Before I give you that definition, let me tell you about this person. Her name is Jocelyn Elders. Dr. Elders was born in Schaal, Arkansas (bonus points to anyone who knows the location of Schaal without looking at a map), graduated from Philander Smith College with a BS in Biology and from the UAMS College of Medicine with a MD degree. She became board certified as a pediatric endocrinologist and spent her entire academic career as a faculty member in the UAMS Department of Pediatrics where she is now Professor Emeritus. I can go on and on about her lifetime accomplishments, but most notably, she served as the United States Surgeon General under then President Bill Clinton. She was the second woman and first African-American to serve as Surgeon General.

Now back to the matter at hand—collaboration and Dr. Elder’s definition that was presented at a Rosalynn Carter Mental Health Symposium several years ago. “Collaboration has been defined as an unnatural act between consenting adults. We all say that we want to collaborate, but what we really mean is that we want to continue doing things as we always have done them while others change to fit what we are doing”.

In providing this alternative definition of collaboration, I don’t think that Dr. Elders was trying to discourage anyone from collaborating. We all know that in science collaborations involving individuals with different backgrounds, training, skill sets, etc. can be helpful in accelerating the discovery process.

To this end, over the past few years, NIGMS has offered grant supplements to encourage collaborations between individuals supported by the various IDeA Program funding mechanisms (e.g., INBRE, COBRE, CTR) and even with other NIH grant mechanisms. Investigators associated with the Arkansas INBRE have benefitted from these opportunities. For example, Drs. Jianfeng Xu (Arkansas State University) and Jason Farrar (UAMS) received an INBRE supplement in 2019 that is supporting their efforts to produce bioactive erythropoietin in plants. In 2020, Drs. Andres Caro (Hendrix College) and Laura James (UAMS) received an INBRE supplement that supported a program in which undergraduate students were exposed to a team-based translational research project focused on improving treatment options for newborns who were exposed to opioids prior to birth.

The Arkansas INBRE has always recognized that collaborations are a powerful way to advance knowledge that has the potential to improve human health. It’s one of the reasons why we have required that faculty funded through the Arkansas INBRE have a mentor. Over the years, several mentor-mentee relationships have matured into a productive collaborative relationship. And we have taken it one step further, by offering collaborative research grants through the Arkansas INBRE DRPP.

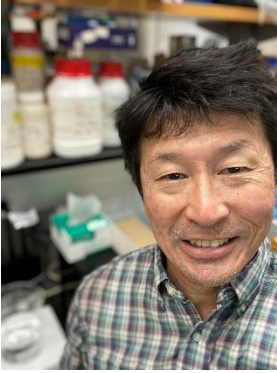
Despite the warnings suggested by Dr. Elders’ definition of collaboration, the Arkansas INBRE will continue to encourage and find ways to support collaborations between faculty and students across the state.

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## Faculty Spotlight



### Tsunemi Yamashita, PhD

Professor  
Arkansas Tech University

I received my undergraduate degree in biology (BA) from Hendrix College in 1985. I then attended Vanderbilt University and received my Ph.D. in 1993 with a focus on scorpion population genetics. I conducted a short post doc at Vanderbilt University Medical Center in Hematology to learn molecular biology lab techniques, then landed my first faculty position to teach genetics and evolutionary biology at Northeast Louisiana University (now ULM) in 1994 before moving to Arkansas Tech University in 1998.

My interest in science and teaching was sparked by interactions with faculty and classmates at Hendrix. Their insights, support, camaraderie, and high expectations helped to create a solid foundation that was expanded in graduate school. I was fortunate to attend Vanderbilt University as a graduate student and the transition from the sleepy, small town of Conway with 10,000 people to the larger, urban environment in Nashville wasn't so bad as the biology department was "general" biology, separate from molecular biology, housing a mix of faculty from all areas in the biological sciences. These were the days when the first PCR thermocyclers first appeared and all arms of biology jumped into the molecular realm with a consolidation of many separate biology departments – seemingly all biology became molecular. In addition, there were a good group of Hendrix grads at Vanderbilt, scattered throughout the graduate school and medical school, so you didn't feel too out of sorts.

I was unfocused as a graduate student in the first few years, but found my niche with conducting genetic analysis on a sand scorpion, *Smeringurus measensis*, that inhabits the dunes of California and Arizona. My graduate work and research ethic were markedly improved with direction and insights from my advisor Gary Polis and my dissertation committee. During this time, I was also further able to understand the important relationship faculty provide as undergraduate mentors and graduate research advisors as well as collaboration among researchers and the importance of interpersonal skills.

I have expanded on the research interests I developed in my graduate thesis with a focus on understanding the diversity and toxicity of scorpion venom. I had previously conducted a phylogeographical analysis of the Arkansas scorpion, *Centruroides vittatus*, and learned much of the genetic diversity exists in the western populations of New Mexico and Texas. Populations east in Arkansas do not show marked genetic separation. This result led me to investigate if the venom diversity and toxicity also show a similar pattern. To this end, with insights and help from my mentors, I have embarked on research to investigate the genomic, transcriptomic, and proteomic diversity of this scorpion.

The Arkansas INBRE program came into fruition in a critical time in my career as I was able to find excellent mentors and collaborators at the University of Arkansas through the INBRE summer mentored research program. With Drs. Douglas Rhoads, Suresh Thallapuram, and Jeff Pummil, I have been able to expand my research capabilities and activities and provide undergraduate students with research opportunities. These efforts have resulted in numerous presentations at state and national meetings, several publications, and further interests in bioinformatics and bioinformatics education. In addition, the INBRE fall meetings have provided an excellent avenue for my students to present their work and view undergraduate accomplishments from across the state and region.

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### ***What you might not know about Dr. Yamashita...***

He thoroughly enjoys the outdoors, especially whitewater canoeing, and paddles a closed deck canoe known as a C1. To the unknowing eye, it looks like a kayak, because it is a kayak with the seat removed and pedestal inserted to kneel in rather than sitting. To a diehard canoeist, this type of boat is preferable if you can stand the bent knees in tight quarters as you still use a canoe paddle and canoe strokes.

## **Development Research Project Program**

*Jerry Ware, PhD, Program Director*



### **Upcoming Dates**

**February 11 – Virtual Grant Writing Workshop**

**April 4 – Research Development Grant (RDG) Due Date**

Once again we offer the Grant Writing Workshop as a prerequisite for submission of a proposal to the Arkansas INBRE RDG award mechanism (FOA [link](#)). The workshop has been an ongoing effort thanks to support from UAMS faculty, scientific writers, and the Arkansas INBRE administrative staff. The goal of the workshop is two-fold; 1) to improve the grantsmanship skills of all applicants and 2) to further the Arkansas INBRE's commitment to professional development.

For those attending the upcoming Grant Writing Workshop, I hope you find it beneficial, and time well spent. Pre-pandemic we were offering the workshop in-person, but the past 2 years have taught us a virtual presentation is possible. Thus, virtual it is again this month. We are always open to suggestions for improvement or other topics that could benefit PUI faculty, so do not hesitate to reach out with suggestions.

### **Writer's Write. Always.**

We all enjoy doing experiments, working with students, and being the "first" to make a discovery or observation. However, writing and communicating may be our most important skill set. For extramural applications to NIH, no matter how wonderful or innovative a proposal may be, the expected currency is a track record of publications. This becomes particularly important for new faculty seeking their first-time award. Reviewers would like to see a publication from the new institution that supports an established and functioning lab. I've heard many times a reviewer supporting a proposal say, "*yes, their lab is up and running*". We recognize that for most faculty within the Arkansas PUI network that large teaching loads have a negative impact on finding time to write, so this requirement is not quite as important for writing a competitive proposal. However, publications are always a noted strength in any proposal.

Having stressed the importance of publications, we have been excited to hear so many positive comments about the summer manuscript support that was offered in 2021. To date, approximately 75% of those

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receiving support have submitted manuscripts that are either “In Press” or already available in PubMed. Equally exciting is a rough count of 18 undergraduate students who are now co-authors on a scientific publication because of this support. Be looking for a similar FOA/mechanism to be announced for the summer of 2022 in the coming weeks.

Finally, one of the biggest issues in writing is how to overcome that activation energy that sets the reaction (writing) in motion. An essential element of this reaction is time. Set aside an hour with email turned off and the door closed. Assume the world will still rotate even when you’re off the grid. Generate an outline for what you need to write. Then, start filling in the blanks. If the writing juices don’t immediately start, assume you are interviewing yourself. Imagine someone in front of you who just asked “*tell me about your research*”. I’m yet to meet anyone in this business that doesn’t immediately start talking. Put those words on paper and later you edit, and edit again.

While we wear many hats, the “*writer’s hat*” should never be far away. To quote Billy Crystal in *Throw Mama from the Train*, “A writer writes – Always.” While our primary job is not being a writer – it will always play a significant role in our successes. Writer’s block comes in many forms, the trick is simply finding a solution that works for you.

## Student Spotlight



**Andrea Isabel Melgar Castillo, PhD**  
**Postdoctoral Fellow**

Pharmaceutical Health Services Research Department  
University of Maryland, Baltimore  
*2014 INBRE Summer Fellow*

I always knew I wanted to be a scientist. For years the plan was to become a geneticist, and once my mind is set, I get to work on it! I was fortunate to receive a scholarship from my country’s government to pursue a career in STEM in the United States. I majored in Biology at the

University of Arkansas. Soon my junior year was approaching, and I had to start thinking about the next step: graduate school. I needed and wanted more experience working in a lab setting that was more involved than the few hours a week I spent as an undergraduate student. This is when I found INBRE.

INBRE allowed me to work as a scientist for an entire summer. It was the perfect window into what a life devoted to science entails. I worked with Dr. Kevin Raney understanding the interactions of G quadruplex DNA structures with helicases. I sharpened basic laboratory techniques and gained more complex ones (for me, at that time of my career) like protein purification and DNA binding assays. This summer I also confronted my fear of public speaking, as giving several presentations of our work to different audiences was an important component of the INBRE program. The scientific presentation skills I gained that summer continue to be invaluable throughout my career, like for example when I presented my work at the oral symposium of the 2019 Annual Conference on the Science of Dissemination and Implementation. And of course, the connections I made. It was eye opening to learn about how as an aspiring scientist you rely so much on the community around you. I established connections with my lab mates, my mentors, and other peers in a way I had not done so as an undergrad. Later when I was a graduate student, these ‘people skills’ were lifesaving.

For international students many summer internship opportunities are not available because of residency or citizenship requirements. Aside from what I gained academically and scientifically, INBRE gave me the chance to not have to worry about this issue and focus only on doing the research I wanted to do. For this I will always

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be grateful. I believe international scholars bring incredibly brilliant ideas and provide diverse insights and solutions. Programs should cultivate this talent instead of turning it away. This is another reason why I think INBRE is amazing!

Being an INBRE alumna was key for my acceptance into graduate school. I began my work with Drs. Angus MacNicol and Gwen Childs at the University of Arkansas for Medical Sciences, studying how leptin signaling to the gonadotrophs is essential for expression of GnRHR. After two years following this basic science route, I found myself wanting to be closer to the translational side of biomedical research. I was able to stay in my graduate school program at UAMS but this time under the mentorship of Dr. Teresa Hudson. My doctoral work focused on exploring the life experiences of veterans who suffered from chronic pain and lost their opioid medication after the Veterans Health Administration implemented strict opioid prescription policy changes. I was trained as a qualitative researcher, I interviewed veterans who were suffering from severe chronic pain and felt unsupported by their doctors and the system. I was also interested in exploring whether veterans experiences varied by race, gender, and geographic location. In my sample I found that Black/African American veterans and veterans who lived in rural areas reported greater challenges to pain management and poorer quality of life after losing their pain medication. These findings sparked my interest in addressing health disparities in the delivery of care and improving health outcomes for all.

I am currently a postdoctoral fellow with the PATIENTS program. I work on several health services research projects that have heavy components of Patient Centered Outcomes Research (PCOR) and Community Engaged Research (CEnR). I love being a scientist, and I feel so blessed that I get to use my knowledge and skills to serve people and communities who need it the most. I truly believe that without my INBRE experience graduate school would have not been an option, so I will forever be thankful for that opportunity!

### ***What you might not know about Andrea...***

She is originally from Panama City, Panama. She is passionate about improving healthcare outcomes for Latin and Hispanic communities, and uses her bilingual skills to connect Spanish-speaking patients to research!

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## Recent Publications

**A Alam M.** *Antibacterial pyrazoles: tackling resistant bacteria.* Future Med Chem. 2022 Jan 20. doi: 10.4155/fmc-2021-0275. Epub ahead of print. PMID: 35050719.

**Plymale R,** Hopkins G, Johnson T, Savage T, Schaal D. *Complete Genome Sequences of Four Putatively Antibiotic-Producing Bacteria Isolated from Soil in Arkansas, USA.* Microbiol Resour Announc. 2022 Jan 20;11(1):e0074521. doi: 10.1128/MRA.00745-21. Epub 2022 Jan 6. PMID: 34989618; PMCID: PMC8759404.

Li D, Xu J, **Yang MQ.** *Gene Regulation Analysis Reveals Perturbations of Autism Spectrum Disorder during Neural System Development.* Genes (Basel). 2021 Nov 27;12(12):1901. doi: 10.3390/genes12121901. PMID: 34946850; PMCID: PMC8700980.

Paidi SK, Rodriguez Troncoso J, Raj P, Monterroso Diaz P, Ivers JD, Lee DE, **Avaritt NL,** Gies AJ, Quick CM, **Byrum SD, Tackett AJ,** Rajaram N, Barman I. *Raman Spectroscopy and Machine Learning Reveals Early Tumor Microenvironmental Changes Induced by Immunotherapy.* Cancer Res. 2021 Nov 15;81(22):5745-5755. doi: 10.1158/0008-5472.CAN-21-1438. Epub 2021 Oct 13. PMID: 34645610.

Alkhaibari I, Kc HR, Angappulige DH, Gilmore D, **Alam MA.** *Novel pyrazoles as potent growth inhibitors of staphylococci, enterococci and Acinetobacter baumannii bacteria.* Future Med Chem. 2021 Dec 8. doi: 10.4155/fmc-2021-0140. Epub ahead of print. PMID: 34877890.

## #sharingnews

Congratulations to Lauren "Clai" Morehead, 2014 and 2015 former INBRE Fellow, who presented nationally on her research on potential treatments for melanoma and was recognized in the COM Internal Communications for receiving a 2022 Medical Student Research Award from the Melanoma Research Foundation.

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