



## Monica Yellowhair, PhD, Diné Kayenta, Arizona, Navajo Nation

Reported by Amanda Bahe / Photographed by Gilbert Lujan  
Rivera Jr. and Amanda Bahe

### Q: What are some things that you did to prepare for your career?

What helped me a lot was getting into a lab when I was an undergrad and working on research projects with other graduate students or my mentor. Also doing at-the-bench science and applying that with what I was learning in my classes. It gave me the experience that I needed. I also found research projects that were very interesting to me and helped me to continue pursuing my higher education goals to get where I am today.

### Q: Is there a cultural aspect to the type of work you do?

A lot of my research can affect a lot of people in my tribe. So, it kind of gives me the sense of giving back and helping my community even though I'm not at home because there are a lot of questions about uranium exposure. Depending on if you live close to a mining site or not, you may have different exposures to uranium, so our research looks

at more relevant concentrations.

The other thing that I do incorporate is the idea of searching for answers and using that knowledge to fight something that's plaguing everybody. In this instance, it's cancer. When I was first going into this research project, I told one of my uncles about it and brought to my attention the story of the Navajo twins and how they slayed monsters that plagued our people. Throughout time, many of the monsters have changed from what was talked about in traditional, cultural stories. Monsters have changed and evolved into certain things so, in this case, one of

### What is Toxicology?

Toxicology is the branch of science concerned with the nature, effects, and detection of environmental hazards presented by chemical and physical agents.

Yellowhair earned a PhD in toxicology at the UA, where she is currently a post-doctoral research assistant. She holds a Bachelor of Science degree in microbiology and a Master of Science degree in chemistry, both from Northern Arizona University. Much of her research focuses on uranium and its effects on DNA in relation to cancer and the efficacy of a certain cancer-related drug. This research compares the role of the environment and diet tendencies in the microbiome of Navajos on the reservation and those in urban settings. Yellowhair's research may have huge implications, especially on the Navajo Nation where uranium is common due to mining, as it may show DNA damage can lead to the development of different types of cancers. Dr. Yellowhair uses her cultural upbringing and traditional stories to relay environmental health knowledge to Navajo communities and hopes to use academia to make a difference in the lives of Native students.

them is mining; the others are diseases and things that affect the environment as a whole. These are modern-day types of monsters, if you will. The only way that we can actually combat these is like the story of the twin slayers. They needed knowledge and help from other people surrounding them. They didn't do it alone - they met people on their journey. In this case, it could be your mentor. Going through that tough journey which takes a lot of endurance and determination - to get your education, to get the necessary skills to work in the research field - to "slay" these monsters.

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### Q: Who was your greatest influence?

I would say my family – they always supported me with what I wanted to do. I also got additional support from my mentors – they were key and were the ones that actually helped guide my career. Whenever I had questions, they were always available. I think once you get yourself into a lab, you have lab mates who you meet, so you also support each other. I guess it's just finding the right support system.

### Q: What does a typical day in the life of Dr. Yellowhair look like?

It changes day to day. Some days I have back-to-back meetings with different principle investigators to discuss project updates or I'm running in and out of lab. Last week I interviewed a new student for a lab training experience to ensure that this is a good fit for them. I explain the science behind everything – what we're doing, how to do proper laboratory maintenance, how to keep a sterile environment. Some days we're just here sitting in the hood for 12 hours and other days I'm sitting there writing. So, it varies on what needs to be done.

### Q: How are you giving back to future generations of students?

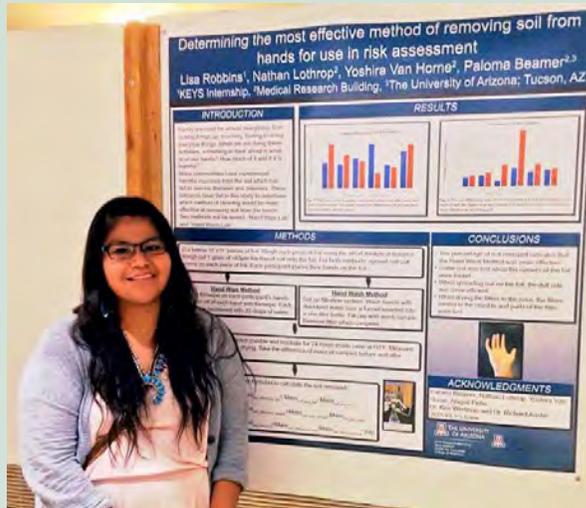
I've been mentoring students since I was at NAU. We trained students from Diné College and other community colleges to do a summer research experience with us. There have been four students that I've mentored in the lab during the summers who continued at NAU. I try to keep tabs on everybody and a lot of them graduated. Some of them went into their nursing programs and others...

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## MOVING FORWARD

by Amy Weisbaum

**Lisa Robbins, Diné  
Greyhills Academy '16  
Hometown: Navajo Nation, Cameron, AZ**



*KEYS intern, Lisa Robbins with her research poster (Courtesy of Lisa Robbins).*

Lisa Robbins, was a 2014 participant in the UA's Keep Engaging Youth in Science (KEYS) summer internship program. She is currently a senior in high school. Lisa plans to attend the University of Arizona.

### Q: What do you want to study in college?

I want to pursue a degree in hydrology, environmental science, and water sustainabil-

ity at the UA. I've also been doing an internship with radon testing and air quality at NAU. I would like to finish that and might attend NAU to continue that research. I also received four scholarships to go to the Berklee College of Music in Boston. I play the piano and compose music as well. I've composed for the Sweet Plantain Quartet and they performed my music at the Grand Canyon Music Festival. So I want to go into music too. My grandma had Parkinson's disease and sometimes she would move around so much and when I played music and slowed down the tempo she would slow down too and stop shaking. My brother has autism and sometimes he gets really stressed out or sad but when you play music for him he'll cheer up. I want to use music in a therapeutic way.

### Q: How did you develop an interest in environmental health?

My interest really started when I was a sophomore. I was taking an engineering science class and that's when it turned on for me. A teacher gave me a packet to go to a summer program at the UA: NASEP. I did a project on water quality and that really opened my eyes to science. I presented my research at the UA, then I took it to the Navajo Nation Science Fair, my school's science fair and the state science fair. These experiences helped me get used to talking about science and made me a better speaker.

### Q: What topic would you like to research in the future?

I want to research uranium exposures and related problems such as cancer and water contamination. Water is huge in Navajo culture because it gives life. It's always mentioned in ceremonies and prayers – it's a sacred thing. When it comes to water, people here take interest.

For example, with the tribally relevant research that you pursue in higher education whether it be in your grad program, as a post-doc, or as a faculty member at a university. I could also teach at the collegiate level or work for a government agency centered around tribal environmental affairs. Sometimes I ponder the thought of going into environmental law, but then again I want to start my career sooner than later.



*Joseph looking out over Moenkopi, Arizona (Courtesy of Carrie Joseph)*

### **A message to Native youth:**

In general, I would say to develop good habits, from wake up time to what you eat, to overall wellness. If you want to contribute effectively, you have to be well overall, so take care of yourselves. It's so easy to stray from this when it gets busy, but if you start early it will be easier, so develop those habits. When you get out into the real world it is okay to be uncomfortable, you will need to get comfortable with being uncomfortable, and soon those situations will be easy for you to manage. Maintain a connection with your home community – spiritual wellness is important. Find a mentor. Apply for internships and scholarships. Most importantly, seek help when you need it. It can be so easy to get discouraged, but asking for help from someone who is willing can make a world of difference. We do not achieve success on our own.

### **University Achievements**

- UA/Sloan Indigenous Graduate Scholar
- 2015 Outstanding Graduate Student Award from UA Native American Student Affairs
- Active member of AISES (V.P. 14-15')
- Associated Students of the University of Arizona (ASUA) award for Outstanding Sustainability/Environmental Program

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...went on to graduate school and got their master's degree. Here at the UA, I've been mentoring ever since I arrived. I've had several students – one went to medical school at Georgetown and she's now doing her residency here at the UA. I have another student who's at the University of North Dakota in his PhD program and other students have gone on to get their doctorate and master's degrees as well.

### **Q: What advice do you have for Native American youth?**

It's very challenging but as long as you have that tenacity, persistence, and determination it can be done. Some days it feels like you're not doing anything but other days you have people that show up and give you inspiration to continue. For instance, I used to speak at my high school back home in Kayenta – I would explain everything that I'm doing and, sometimes, you don't know if the students are listening or not but fast forward five and a half years later, I was at a function that had students from both NAU and UA and one of the students came up to me, he shook my hand, and said "I just wanted to say thank you because I was one of the students from your class that you talked to in high school – now I'm graduating and going to my master's program." It's just like, whoa! You always find something – I guess my advice is to continue and stick it out even though it can be very challenging and very difficult because it can also be very rewarding.



*Yellowhair preping the fume hood for her research (Photograph by Gilbert Lujan Rivera Jr.).*

### **Q: What are your goals – what do you hope to accomplish?**

I would like to get a tenure track position and continue the research that I'm working on, continue to get funding and bring in students and get my own lab – a lab of my own.