SPOTLIGHT: THE UNDERGRADUATE RESEARCH EXPERIENCE

What is your current position and how did you get to where you are?

Hello. I am Wendy Shaw and I am an Associate Laboratory Director at Pacific Northwest National Laboratory. My path here has been a 30 year journey starting with an internship before my final year as an undergraduate and falling in love with the mission and the people. Working for a couple years and having the company send me back to school to get my PhD. Then working to build my scientific career for 15 years before getting excited about managing a group of scientists. That led to leading a division, then leading strategy as a Chief Science and Technology Officer, until I got to my current position..

What made you decide to do research as an undergraduate student?

I was at Whitman College and had two professors, one a biochemist and one an organic chemist, who were working together on trying to understand a chemical that could inhibit aldehyde dehydrogenases, with many potential health impacts. As a chemistry major, I was in charge of the organic synthesis of the molecule, working with a couple of other students doing characterization and biochemistry. It was exciting to do basic research in partnership with people with different skills that had the potential to have real impact! We ended up publishing the work in Biochemical Pharmacology a couple years after I graduated—that was really rewarding.

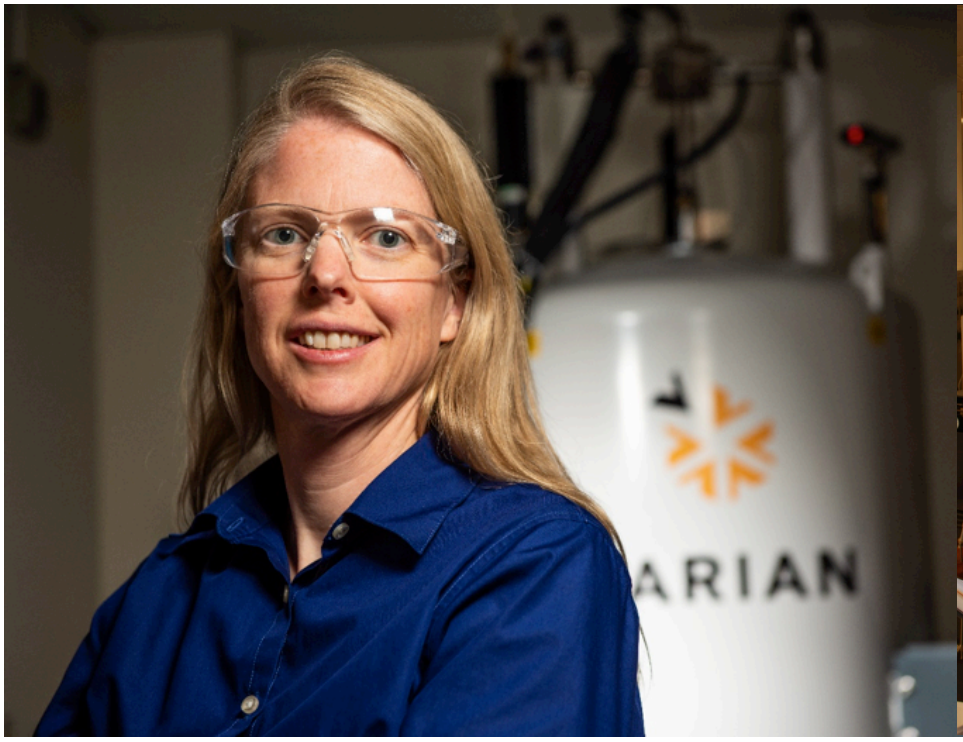
I also worked at Pacific Northwest National Lab as an undergraduate researcher—this experience showed me what a career outside of academia could look like and truly opened my eyes to multi-disciplinary collaborative research. My project that summer was focused on organic free radical chemistry, and in that process I got to use multiple types of spectroscopy. My favorite spectroscopy was Nuclear Magnetic Resonance, and this experience was the foundation for a deep love of NMR, the topic of my PhD thesis.

As an undergraduate researcher, was there particular incidents that stand out?

Perhaps what stood out most was the time that my mentors were willing to invest in me and also the team work. My direct mentor spent hours in the lab training me, while I am sure he had many other demands on his time. I also had “supporting” mentors who would show me where things were in the lab or how to perform a particular technique or help me to understand the chemical reactions and the bigger implications of the work; they were all happy to take time out of their day to do that. We also had meetings every Monday where the team would talk through what they were doing and how each piece fit together. Everyone had their own role, but they all depended on each other to get it done. That really set a strong foundation for me for what effective teamwork could look like.

How did undergraduate research affect your career direction or play a role in your career choice?

Both of my undergraduate research efforts involved collaboration with multiple disciplines and that has been a highlight of



all of my science, and really my career choice. At the National Lab, we are trying to solve some of the hardest problems in energy and national security for the nation. These are problems that no one person, or even one lab, can solve. My experience as an undergraduate started that passion of multi-disciplinary research that continues to this day.

Did you publish your research as an undergraduate, and if so how did that experience serve to encourage you?
My research did result in a publication a couple of years later. It was my first peer reviewed publication and I remember how excited I was to finally have my name in print! One thing that wasn't clear to me as an undergraduate is how much of my career I would spend writing—whether it is papers, proposals, letters of reference, good writing skills are SO important to a scientist and something I would encourage everyone to spend the time developing.

Any final thoughts? (perhaps addressed to mentors and/or to undergraduates considering doing research).
I think doing research as an undergraduate is invaluable—it can help you to figure out if you even want to go after a research career, or perhaps use your scientific knowledge in a different way. As an example, I had a summer student who worked for me for two summers. She started out as a chemistry major, but after working in the lab, she realized that she really wanted to be around and interact with people more directly, so she changed her major. Many students realize it is amazing and they just want more. It is so much better to realize that before you spend 4-6 years getting a PhD. Beyond that, you get to see what a career in research could be like, wherever you do the undergraduate research, it is a chance to learn new science, a new geographical area, or a potentially an industry that you never would have considered as a career choice. The possibilities to discover what interests you, learn about your skills and talents, and learn more about your chosen field or related fields are nearly endless. I see no downside and huge upsides and encourage everyone that is able to do undergraduate research.