

ASPB Pioneer Member

Ruth Welti

How my career in plant biology got started: Not very deliberately!

I was raised in a small town in Connecticut in a family that always had a garden and perhaps also an above-average interest in plants. Still, I didn't consider being a plant biologist, or scientist at all, while growing up. I worked in a grocery store in high school and while pursuing a degree in chemistry from the University of Connecticut. I thought I would become a physician, but I didn't do anything beyond coursework to prepare for that career, nor did I get accepted to medical school. Likely, my interviews were unimpressive. Following college, I followed my boyfriend to St Louis, worked as a research technician at Washington University Medical School, and decided to try graduate school. Within a few weeks of beginning school at "Wash U", I knew I had made the right decision. I LOVED being a scientist and still do. In my PhD work, I studied the biochemistry and biophysics of membrane lipids in model systems and mammalian cells with David Silbert, who was an excellent scientific role model. After postdoctoral training on phospholipid transfer proteins at the University of Kansas Medical Center with George Helmkamp, who taught me to write, I joined the faculty at Kansas State University in 1985 and developed a research program centered around membrane biophysics.



In the late 1990s, I co-taught a graduate class on "Lipids" with plant biochemist Xuemin "Sam" Wang. At the time, my research program was flagging. In class, we read a paper on lipid analysis by mass spectrometry (Brügger et al., 1997, Proc. Natl. Acad. Sci. U.S.A. 94, 2339), and Sam convinced me to investigate this new approach. I also started attending meetings of the Wang lab, discovering a few of the secrets of plant biology. Coincidentally, the University of Kansas Mass Spectrometry facility, headed by Todd Williams, had just acquired a new electrospray ionization triple quadrupole mass spectrometer. Todd and I dug in to establish lipid analysis on the instrument, to extend the published methods to cover lipids unique to plants, to make it as quantitative as possible, and to develop data processing strategies for sample sets, rather than individual samples. In 2002, we published the first paper using "lipidomics" to characterize the function of a plant gene (Welti et al., 2002, J. Biol. Chem. 277, 31994), and so began

my career in plant biology. Sam, Todd, and I launched the Kansas Lipidomics Research Center in 2003 at Kansas State with funding from Kansas NSF EPSCoR. Sam left Kansas State the next year, leaving me to manage the Center. However, both Sam Wang and Jyoti Shah coached me for years as my lab evolved into a plant biology lab. Eventually Kathrin Schrick and Tim Durrett took over some of the coaching duties, and Sam, Jyoti, Tim, and Kathrin all continue to be wonderful colleagues and collaborators.

My most important contribution?

The Kansas Lipidomics Research Center has been successful over the years in obtaining instruments through the major research instrumentation program of NSF's Division of Biological Infrastructure. We have been able to provide lipid analysis using mass spectrometry for nearly 800 labs from around the world, with the majority of the analyses focused on plant lipids. The success of the analytical lab is largely due to the excellent work of Mary Roth, our lab manager, and technicians Pamela Tamura and Libin Yao. While our lab has made contributions to understanding how lipid metabolism interacts with plant stress responses, I believe that our biggest contribution to the plant biology community has been through the work of the KLRC.

Advice to a young person considering plant biology

I've heard scientists talk about their lifelong passions for science. My first



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piece of advice is: Don't worry if you don't have a strong passion for science at a young age. Go to school, learn all you can, stay near things that interest you, and it's likely that opportunities will arise.

My second piece of advice is: Collaborate with good people whenever you have the chance. It's fun and the outcome is often more than the sum of the parts.

I want to thank my two daughters, Ellen, an ecology researcher, and Lia, whose interests include biogeography and libraries, my six cats, and my large garden for enriching my life. Finally, I want to take this opportunity to thank my lab members, former lab members, and other supporters and collaborators. I appreciate all of you and realize that "my" success is based on the collaborative work of a wonderful group of people.