Alison W. Roberts

How did you spend your career?

As a lover of camping, backpacking, and all things outdoors, I arrived as a freshman at the University of California, Davis, with the aim of becoming a field scientist. I majored in geology and botany and took courses that included field trips to the varied geological formations and plant communities of Northern California. However, what I ultimately found most fascinating was the inner workings of plant cells. As an undergraduate researcher in Bill Lucas's lab, I inserted electrodes into giant algal cells and was amazed that it was possible to detect the opening and closing of their membrane channels. Continuing in the lab as a technician and then an MS student, I learned electron microscopy and discovered that guard cells seal off their plasmodesmata before reaching functional maturity. My final year at UC Davis was spent supervising the labs and training the teaching assistants for the introductory biology course.

I began my PhD program at the University of Texas, where I worked in Malcolm Brown's lab with an inspiring group of students, postdocs, and international visitors. One of the postdocs was Candace Haigler, and when she became an assistant professor at Texas Tech University, I joined her lab as her first graduate student and began a collaboration that continues to this day. Using transdifferentiating *Zinnia* suspension cultures, we investigated the cellular factors that regulate deposition of the patterned secondary cell walls of tracheary elements.

I have always found great satisfaction in teaching and happily accepted a temporary position teaching general biology and plant anatomy at Texas Tech after I completed my PhD. A year later I started my own lab at the University of Rhode Island (URI), where I continue to lead a research group and teach courses in plant development and plant physiology.

Two sabbaticals and participation in a multidisciplinary research center have greatly influenced my career. The first sabbatical was back at UC Davis in Debby Delmer's lab. Working with an international group of students and postdocs, I learned to clone genes and, with my husband Eric Roberts, identified the first algal cellulose synthase. It was also during this sabbatical that Steve Theg and Nancy Hofmann introduced me to the moss *Physcomitrella patens,* which has been the focus of much of my subsequent work.

The second sabbatical was with the Australian Research Council Centre of Excellence in Plant Cell Walls, hosted by Geoff Fincher and Rachel Burton at the University of Adelaide and Tony Bacic and Monika Doblin at the University of Melbourne. There I worked with carbohydrate chemists to discover the function of a *Physcomitrella* arabinoglucan synthase. This enzyme, which resembles mixed linkage glucan synthases in its ability to form two distinct glycosyl linkages, appears to have evolved in algae and was lost in the seed plant lineage.

Since 2012, I have been a member of the Center for Lignocellulose Structure and Formation led by Daniel Cosgrove. The center has provided my students and me with the opportunity to work with physicists, computational modelers, and other biologists to better understand the structure of cellulose synthesis complexes and the microfibrils they produce.

What do you consider to be your most important contributions to plant science?

I think it would have to be contributing an evolutionary perspective to the field of cell wall biology. I have long been fascinated by the diverse and stunningly complex photosynthetic organisms that don't produce seeds. As an undergraduate at UC Davis, I was privileged to learn about these organisms from some of the leaders in their fields, including phycologist Norma Lang, paleobotanist James Doyle, and morpholo-

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gist Ernest Gifford. The cell walls of these organisms exhibit structural and developmental specializations reflecting their adaptation to diverse terrestrial and aquatic environments. Examination of these specializations, as well as commonalities with seed plants, has helped reveal how evolutionary processes have impacted cell wall biosynthetic machinery resulting in compositional and structural diversity.

When did you become a member of ASPP/ASPB?

I joined ASPP as a graduate student and have been a member ever since.

How did the Society impact your career, and what motivated you to become a Founding Member of the Legacy Society?

When I joined the faculty at URI, its plant biology community was small and shrinking, a trend that continues to this day. The ASPP Northeast Section became my intellectual community, and their annual meetings provided critical networking opportunities for my students and me. Just a few years into my faculty position, the section entrusted me with hosting their annual meeting at URI. This was before email was universal, and all communication was by post. Organizing the meeting required months of sustained effort that unexpectedly overlapped with the demands of caring for my newborn son. However, my effort was repaid many times over through expressions of gratitude from my URI and regional colleagues and the students who attended.

A short time later, the section elected me to represent them on the ASPP Executive Committee. This experience opened my eyes to the inner workings of the Society and the commitment of its leaders to increasing the visibility of plant biology research and supporting the good works of members. The important issues of the time included the changing publishing landscape brought on by online journals and the consequences for Society revenue, declining membership, and the vote to change our name from ASPP to ASPB. I feel privileged to have played a small part in making the decisions that ultimately strengthened our community and its impact on society.

What important advice would you give to individuals at the start of their career in plant science?

I would advise all early career scientists to seek collaborators who complement their expertise and share their interests and values. As an assistant professor I was warned to avoid collaborating. The message was loud and clear: you will get credit only for “independent” work. I mostly followed this advice and was awarded tenure, but it was at the cost of missed opportunities. Since then, I have worked with scientists from around the world and from various disciplinary backgrounds and career stages.

I would also advise that collaborations work best when the project goals and the roles of the participants are clearly defined at the outset. I am grateful to my many collaborators, including those whom I have mentored and those who have mentored me, for enriching me professionally and personally by generously sharing their ideas and their friendship.

Academic Family Tree

https://academictree.org/plantbio/tree.php?pid=806586