

Maarten J. Chrispeels

How did you spend your career?

From a very early age, I was interested in keeping a vegetable garden, and after completing high school in Brussels, Belgium, I enrolled in the College of Agriculture of the University of Ghent. After completing this five-year degree, I came to the United States and enrolled as a graduate student in the Department of Agronomy at the University of Illinois at Urbana-Champaign. I really had no idea what I was going to do there, because my interest was not so much in agronomy—crops and soils—as in basic plant biology. I chose John B. Hanson as my PhD adviser and worked on the processes of cell enlargement and differentiation of corn root cells. Hanson was an excellent adviser, who allowed me to go off on tangents and emphasized the importance of asking important questions. This got me interested in structure–function relationships at the subcellular level.

I was fortunate in my choice of postdoctoral adviser, as I received excellent training with Joe Varner at the newly established Atomic Energy Commission (later DOE) Plant Research Laboratory at Michigan State University. Varner had just started working on the role of gibberellic acid in eliciting the synthesis of amylase and other hydrolases by the aleurone cells of barley. I followed in his footsteps, and the paper from this work, published in *Plant Physiology*, remains my most cited research paper more than 50 years later.



After three years, I was again fortunate to be hired as an assistant professor at the newly established San Diego campus of the University of California (UCSD). The work with Varner got me interested in protein secretion, and I started working on the biosynthesis and secretion of extensin. At Michigan State, Varner's lab was next to Derek Lamport's lab, and he had discovered and named this unusual cell wall protein. The cell wall was then still considered the dead box that surrounds the living cell. After a sabbatical leave in 1973–1974 with Don Boulter in Durham, England, I switched gears and started working on the transport of proteins to the storage vacuole in cotyledons of legumes. We discovered the important role of the endoplasmic reticulum and the Golgi apparatus in synthesizing, modifying, and transporting storage glycoproteins, like vicilin, to the protein storage vacuoles of the common bean. In addition, by trans-

ferring a cDNA encoding the bean vacuolar protein amylase inhibitor to peas, we made the first insect-resistant seeds using genetic engineering. This project was carried out in collaboration with T. J. Higgins at CSIRO in Canberra, Australia.

Research on storage proteins remained my major effort for 20 years, until 1994, when Christophe Maurel, a French postdoc in my laboratory, demonstrated that one of the tonoplast proteins we were investigating transported water across the plasma membrane of *Xenopus* oocytes. The fascinating and unexpected discovery of water channel proteins, or aquaporins, led to a reorientation of our research toward plant–water relations. We found that aquaporins are present in both the tonoplast and the plasma membrane and are encoded by a large gene family.

What I have described so far is my research career. When I was with Joe Varner, I witnessed his involvement as an author—as an associate editor of *Plant Physiology* and, with James Bonner as coeditor, of the widely used textbook *Plant Biochemistry*. Public service was an integral part of his career, and it became part of mine. Following are some examples of my many activities.

When asked to join the editorial board of *Plant Physiology*, I accepted. Later I became an associate editor, and around 1990 I offered my services to become the editor-in-chief. I believed that the entire editorial board and the system of reviewing papers needed renewal.

Early on I wrote a small paperback entitled *Plants, Food, and*

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ASPB Legacy Society Founding Member

People, with David Sadava (W. H. Freeman, 1977). This effort morphed into the textbook *Plants, Genes and Agriculture: Sustainability Through Biotechnology* that saw three editions, the last one published by Oxford University Press in 2018.

When Congress funded the USDA Competitive Grants Program for the first time and Joe Key was named director, I called Key and offered my services as a panel director. I was at that time coming to the end of my three-year stint as a reviewer on an NSF panel and was confident I knew the ropes. I am proud to have helped launch this important USDA initiative.

For 12 years, I served on an international panel of scientists to evaluate grant proposals submitted to the Millennium Initiative in Chile, a most rewarding experience. I traveled to Chile many times and witnessed the growth of plant biology research there.

Toward the end of my career at UCSD, I was director of ScienceBridge, a small campus organization that orchestrated outreach by our grad students to high schools in the San Diego area.

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

I had a successful career in research, but I would consider all my other activities, generally considered public service or service to the profession, just as important—mostly because they enriched my life enormously. By being involved in so many activities during my 40-year career at UCSD, I came in contact with hundreds of fascinating scientists. I learned

from them, and I hope they learned something from me.

In addition to the activities mentioned above, I helped found two companies: Phylogix, with Jeff Moore, a collaborator from the pharmaceutical industry, and Arterra Biosciences, with Gabriella Colucci, a former postdoc. Phylogix went bust when the investors decided to withdraw their support, but Arterra, which employs 30 early career Italian scientists, recently had a successful IPO.

I gave short courses in agricultural biotechnology at the University of Louvain in Belgium; at the Institute for Biotechnology in Cuernavaca, Mexico; at the Autonomous University of Baja California in Ensenada, Mexico; and, twice, longer courses at Huazhong Agricultural University in Wuhan, China.

I was fortunate that people who had already received excellent training came to my lab as postdocs. They, together with just a few undergraduates and one or two graduate students, created an incredibly stimulating environment. I don't think that I trained them, but they must have learned something, because most went forth and had successful careers in academia, industry, and government.

When did you become a member of ASPP/ASPB?

I think I became a member of ASPP in 1963, a few years after I came to the United States and started my PhD program. For plant biology meetings at that time, it was just about the only game in town except for an occasional Gordon Conference. Furthermore, both of my mentors, John Hanson and Joe Varner, were active in the

affairs of the Society and went to the meetings.

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

ASPP provided me with an intellectual home and allowed me to channel some of my creative juices. I spearheaded the name change of the Society from ASPP to ASPB and introduced the name change for our annual meeting from the cumbersome "Annual Meeting of the ASPP/ASPB" to the much shorter "Plant Biology [year]." I gave *Plant Physiology* a whole new look by introducing covers with pictures of one of the articles in the issue—a move opposed by the previous editor-in-chief—and I streamlined and shortened the reviewing process. I wanted people to notice that things were going to be different. Again, I was lucky, because when I resigned after seven years, Natasha Raikhel agreed to become editor-in-chief, and she brought more innovations and raised the impact factor even higher.

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

Follow your star, be open to new ideas and approaches, and collaborate. As a plant biologist, whether you work in the private sector, government, a nongovernmental organization, or academia, these three things should guide you, and you will benefit.

Academic Family Tree

<https://academictree.org/plantbio/tree.php?pid=770881>