

Eran Pichersky

How did you spend your career?

I grew up in Israel and attended elementary and high schools there. In 1973, at the age of 18, I was conscripted into the military (there was, and still is, general conscription in Israel). In high school I liked math and physics; I thought I would pursue these areas in college after I finished military service. However, my military service was as a foot soldier (and later officer) in a unit that spent most of its time—day and night—in the open. This is when I discovered plants: I hid behind them, often walked on them, and sometimes crawled over them. Israel is a small country and has many microclimates, from desert to alpine and everything in between, and the plant diversity is quite amazing. It was because of encounters with plants during my military service that I decided to pursue a scientific career studying plants.

For my undergraduate education, I attended the University of California, Berkeley (1977–1980), a choice I made because I wished for a relatively calm and quiet environment to pursue my studies. At Berkeley, I took standard botany courses as well as courses in biochemistry, molecular biology, genetics, and many other fields, including literature, history, philosophy, and languages.

I then obtained my PhD with the late Leslie Gottlieb at the University of California, Davis (1980–1984). It was during that time that the field of plant molecular biology was being established.



Plant genes were being cloned and analyzed for the first time, and at that point one could undertake any topic of research in plant biology and find oneself a pioneer. My PhD work was on gene duplications in plants and involved genes encoding glycolytic enzymes—Gottlieb’s lab was one of the first to realize that gene duplications in plants (and indeed in eukaryotes in general) are quite common. In 1984, I joined Anthony Cashmore’s lab at Rockefeller University as a postdoc to work on another gene family, the one encoding photosynthetic proteins.

In 1987, I established my lab at the University of Michigan (UM), Ann Arbor, and have been there ever since. At UM, I started a new project focusing on the identification of genes and enzymes involved in scent production—mostly in flowers, but also in other parts of the plant such as trichomes, leaves, and even roots. As I predicted, genes involved in the biosynthesis of volatile metabolites often arose by

duplication and divergence, and we have investigated many such gene/enzyme families, sometimes identifying the first members of such families (e.g., the SABATH methyltransferases). This overall project has been going on for more than 30 years (the first graduate student on the project, Robert Raguso, began in 1989) and has constituted the bulk of my scientific work and that of my many graduate students and postdocs who now run their own labs in academia or industry.

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

One should be modest here. I was not the first person to work on “scent genes.” Notably, Rod Croteau and his group did seminal work on menthol biosynthesis in mint leaves and terpenes, in general, in conifers. But when my lab began studying the molecular biology of floral scent, there were no examples of any enzymes, let alone genes, involved in such a process. We identified many enzymes and genes responsible for the biosynthesis of volatile compounds from various biochemical pathways, including terpenes, phenylpropanoids, benzenoids, fatty acid-derived scents, and more. These enzymes often belong to enzyme families such as terpene synthases, methyltransferases, acyltransferases, and others. We have particularly paid attention to the process by which these enzymes evolved, by gene duplication and divergence, to help the plant succeed in a specific ecological niche.

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ASPB Legacy Society Founding Member

I would like to list two other contributions of which I am proud. One—the most important one, really—is the large number of people trained in my lab. I will not list names, because I am afraid to leave someone out, but most continue to be active and to make important contributions to the field of molecular biology and biochemistry of plant volatiles.

Another contribution was on its face semantic, but in fact it was much more than that. The plant compounds I have worked on for the past 30 years used to be called “secondary.” The historical reasons for this term are complex and not necessarily logical. True, these compounds are often found in only a subset of plants and in just a small part of the plant, but without going into details, suffice it to say that there is nothing secondary about them. Rather, they play essential roles in the success of plants in passing their genes to the next generation, the only definition of success in biology. These compounds are not shared by all plants because they evolved in specific plant lineages as specific adaptations to particular ecological niches. I therefore introduced the term “specialized metabolites” to describe these compounds, and this new term, which much better describes the roles and origin of such compounds, is now firmly established in the field.

When did you become a member of ASPP/ASPB?

I do not remember exactly, but it must have been in the 1980s. At that time, we received and read the hard copy of *Plant Physiology* (there

was no other version), and I wanted to be able to read all the latest hot stuff in the area of plant science before the issue was available in the library. I admit that this was the only reason; at that time, I was still only dimly aware of all the great work ASPP was doing in promoting plant research in the United States and the rest of the world. I became fully aware of the extent of the Society's activities only after many years during which I attended its meetings, served as an editor for *Plant Physiology* and as a member of the Fellow of ASPB Award Committee, and had various other interactions with the Society and its officers.

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

I cannot point to a direct involvement of ASPB in developing my career, except through its many contributions to the field of plant biology in general. But exactly these contributions, because they are general to the field, are so important to the next generation of plant biologists. If I want to find a “selfish” reason for making sure that ASPB survives in the long run, it would simply be this kind of contribution, which many of my own students and postdocs will benefit from in their own career.

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

- Find a niche for yourself: work in an area that is unique to plants (no competition from

animal researchers, who get more money for their research and always claim their work is “more important,” even when the quality of the work is inferior to yours). Work in a less crowded area of plant biology: not a less important area, but an area whose importance has not yet been recognized.

- Be a contrarian: if there is a consensus in your area, find out whether it is justified. It may be, so there is not much new to do there, in which case, look for another area in which the consensus is wrong.
- Be extremely collaborative: work with as many groups as you can to complement your skill set (as long as they share your high standards). Don't hesitate to give away projects; let others finish up your projects, and then start new ones (but one way or another, make sure projects are followed through, by your own group if necessary).
- Take real sabbaticals: spend at least a few months in another lab that does things you are not doing now but would like to learn how to do. Work in the lab there as a regular foot soldier, because this is the best way to learn how to do new things.

Academic Family Tree

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