Stanford Professor Virginia Walbot wins genetics prize for lifetime achievement

Stanford geneticist Virginia (Ginny) Walbot has been selected as the 2023 recipient of The Barbara McClintock Prize for Plant Genetics and Genome Studies by the Maize Genetics Cooperation for her lifetime contributions to the fields of plant genetics and genomics.

The Maize Genetics Cooperation—a nonprofit organization dedicated to advancing research in maize genetics, genomics, and breeding—awards the Barbara McClintock Prize for Plant Genetics and Genome Studies to one or more of the most creative minds and productive scientists in the study of genome structure, function, and evolution in any plant system. Awardees are chosen for the accomplishments that span their career. They must also be actively engaged in research at the time of nomination.

This award was created to honor the contributions of renowned plant geneticist Barbara McClintock, who won the 1983 Nobel Prize in Physiology or Medicine for her discovery and characterization of transposable genetic elements—"jumping genes"—that she determined could move within the genome. She was the first woman to receive an unshared Nobel Prize in the sciences. The Barbara McClintock Prize is announced every year on Oct. 10 to commemorate the day when McClintock learned she would receive the Nobel Prize. The McClintock Prize will be presented to Professor Walbot at the 65th Annual Maize Genetics Meeting in March 2023.

Walbot, a professor of biology in Stanford's School of Humanities and Sciences, has a remarkable range of expertise in plant biology as evidenced by her numerous and varied contributions. Over the course of her career, her seminal discoveries have deepened and broadened our understanding of critical genetic processes in corn, the largest global crop. Building upon McClintock's work, Walbot helped determine how and where transposons (i.e., jumping genes) move within the corn genome. Walbot's discovery enabled researchers to both understand and track transposon movement, allowing breeders and geneticists to harness transposons as tools for generating genetic diversity and cloning genes.

Beyond transposons, Walbot is widely credited with creating and deploying new technologies to better understand the fundamental connections between genome organization and gene functions. She led a consortium of 10 laboratories participating in the $13 million NSF-funded Maize Gene Discovery Project from 1998 to 2003. This project provided the first detailed look at maize gene expression in diverse organs, generated more than 50,000 sequenced transposon mutation sites, and developed key resources for the community to conduct research in all aspects of maize biology.

The corn kernel is arguably the most important seed in agriculture and her work in flower development—specifically, the male flower where pollen is produced—and the kernel itself offered keen understanding to how both are influenced by environmental conditions. Corn, like most crops, is threatened by pathogens; Walbot's work has also significantly enhanced our understanding of the relationship between corn smut, a pathogen that can devastate a farmer's field, and the host plant. Any one of Walbot's numerous discoveries would have been a career high, but to have so many across such varied fields makes her particularly deserving of this award.