Joanne Chory

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"Our lab is interested in identifying the mechanisms that plants use to respond to changes in their environment, particularly light. Our hope is that by discovering the molecular triggers that determine whether a plant matures into a spindly or robust specimen, we can contribute to efforts to increase crop yield and alleviate hunger."

Stuck where the seed germinates, plants have to make the best of their real estate. They rely on an impressive arsenal of light-sensitive photoreceptors to decide when to germinate and flower to ensure the next generation of seeds. For more than 20 years, the Chory laboratory has studied the signaling pathways plants use to detect changes in the sunlight that hits their leaves, not only when seasons change but also when they grow in shady, crowded conditions. During the course of their studies, she and her group have assigned specific functions to a number of photoreceptors that regulate plant growth, identified components of the light signaling pathways, and shown that photoreceptors link the local light environment to hormone biosynthesis and signaling pathways within the plant.

Lately, Chory and her team have been expanding their studies to a collection of natural isolates of the thale cress *Arabidopsis thaliana*, which have been gathered all over the Northern Hemisphere, to investigate how genetic variation in light-sensitive pathways ensures that plants in light-starved northern latitudes are more sensitive to light than their counterparts growing in the sun-drenched Mediterranean. Using a reference strain of *Arabidopsis*, they have embarked on a systematic genome-wide reverse genetics screen to assess the contribution of almost every gene to light sensing and signaling in a variety of light environments.

Knowing the full spectrum of genes that can be altered in the laboratory to affect an adaptive trait—and how this compares with the genes that affect plants' appearance in the wild—will advance understanding of how genes evolve together to make an efficient, coordinated network. This prospect is of direct and obvious importance not only to evolutionary biologists and plant breeders, but also to human biology, where similar experiments cannot be carried out. Moreover, Chory's research may eventually enable researchers to develop plants that are particularly well-adapted to challenging environments, boosting the yields of agricultural crops.

For more information, please visit
salk.edu/faculty/chory.html

Left to right:

First row: Hong Ren (blue shirt), Emilia Pires, Eirini Kaiserli, Fang Yang, Willie Chen, Lin Li, Joanne Chory, Rebecca Kasl, Michelle Row

Second row: Prasanta Dash (grey shirt), Zuyu Zheng, Tsegaye Dabi, Jesse Woodson, Juan Perez Ruiz, Ullas Pedmale, Yvon Jaillais, Ben Cole, Lynn Artale, Michael Hothorn, Hou-Sung Jung