



LUCIA STRADER

Professor

Howard H. and Maryam R. Newman Chair
in Plant Biology

Strader is a plant biologist studying how plants sense and integrate environmental cues to shape their growth and development. Her discoveries on the plant hormone auxin are helping scientists design more resilient crops that can thrive in changing environments.

THE CHALLENGE

Plants must constantly adapt to their surroundings. They wait for the right temperature, light, nutrients, and water levels to trigger each developmental stage, shifting their priorities to align with their changing environment.

One of the biggest challenges in plant biology is understanding how plants sense and integrate these complex environmental signals and translate them into growth decisions. At the center of this signal integration is auxin, a hormone that regulates nearly every aspect of plant development. However, many of the systems that interact with auxin remain poorly understood. Without this core understanding, we face significant barriers in developing stronger crops that can thrive under changing climate and nutrient conditions.

THE APPROACH

Strader investigates how plants integrate environmental information with hormone signaling to shape plant growth and development. Her lab is building a molecular understanding of the spatial and temporal control of plant hormone responses, particularly in their regulation of gene transcription. Her multidisciplinary approach combines techniques from plant physiology, genetics, molecular biology, biochemistry, structural biology, biophysics, systems biology, and synthetic biology to understand the mechanisms of auxin regulation.

Strader's lab is also using these insights to develop heartier, more resilient crops that can better withstand extreme weather events, use nutrients more efficiently, and produce reliable yields in the face of environmental stress.

THE INNOVATIONS AND DISCOVERIES

- Strader's team determined a mechanism for regulating the cell-type-specific auxin response, providing a tunable knob for plant growth.
- Strader identified the activation domains of all Arabidopsis transcription factors, explaining how these proteins 'turn on' genes in the plant.
- Strader's lab has identified how specific auxin inputs control distinct aspects of plant growth.

For more information, please visit:
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