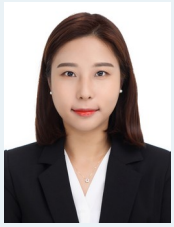
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RESEARCH & COLLABORATION PROFILE

KEY WORDS: mixotrophy, dinoflagellates, cell signaling, plant Immunity, plant-microbe interactions



Research Snapshot. Dr. Jeon is a cell biologist who studies how cells perceive environmental and biotic signals and reprogram their physiology. Her current G-LAMP research uses the mixotrophic dinoflagellate *Ansanella catalana* as a model to understand how environmental cues regulate the switch between photosynthesis- and feeding-based energy production at the cellular and molecular levels. She also studies plant–pathogen interactions, focusing on how bacterial effectors manipulate host cellular processes and how host factors shape plant immunity.

RESEARCH EXPERTISE

- **Mixotrophic trophic-mode switching:** how a single dinoflagellate cell (*A. catalana*) chooses between photosynthesis- and feeding-based energy production in response to light intensity, light quality, and prey availability.
- **Cellular characterization of trophic states:** how autotrophic and heterotrophic cells differ in growth dynamics, cell architecture, Ca^{2+}/ROS signaling, cell cycle, and photosynthetic status, tracked by integrated flow cytometry and imaging.
- **Bacterial effector biology:** how bacterial virulence proteins target host factors and organelles to suppress plant immunity.
- **Plant immunity & disease resistance:** how polyploidy and ion transport shape plant resistance to bacterial pathogens.

RECENT RESEARCH HIGHLIGHTS

- **Light-dependent trophic switching (G-LAMP, 2026):** high light favored autotrophic growth, whereas low blue light most strongly sustained prey feeding, and auto/hetero states showed distinct cell architecture and Ca^{2+}-signal patterns; time-course RNA-seq at prey-depletion-defined time points is underway to identify switching signals.
- **Effector-driven cytoskeleton disruption (Mol. Cells 2025):** the disordered effector RipAO associates with tubulin and fragments microtubule networks, dampening defense responses in tobacco.
- **Pathogen manipulation of plant immune kinases (Plant Pathol. J. 2026):** the F-box effector RipG6 destabilizes a host receptor-like cytoplasmic kinase, a key relay in plant immune signaling, thereby weakening plant defense.

POTENTIAL COLLABORATION RESEARCH

Best-fit collaborator areas: bioimaging | plant pathology | photosynthesis & bioenergy | oceanography | omics

- **1. Trophic-mode switching & marine ecology:** linking cellular switching of mixotrophs to carbon flow and algal bloom dynamics.
- **2. Photosynthesis & bioenergy:** light-quality control of microalgal biomass and pigment production.
- **3. Omics & signaling networks:** multi-omics combined with Ca^{2+}/ROS signaling to map trophic-transition networks.
- **4. Plant immunity & disease resistance:** effector targets, immune kinases, and ion transport toward disease-resistant crops.

SELECTED RECENT PUBLICATIONS

- **Plant Pathol. J. 2026, 42, 300 —** F-box effector RipG6 destabilizes an immune receptor-like cytoplasmic kinase.
- **Mol. Cells 2025, 48, 100167 —** Disordered effector RipAO destabilizes plant microtubule networks.
- **Mol. Plant-Microbe Interact. 2023, 36, 208-217 —** Host endomembrane manipulation by bacterial effectors (review).
- **Mol. Cells 2023, 46, 710-724 —** Effector RipL delays flowering and promotes disease susceptibility in *Arabidopsis*.

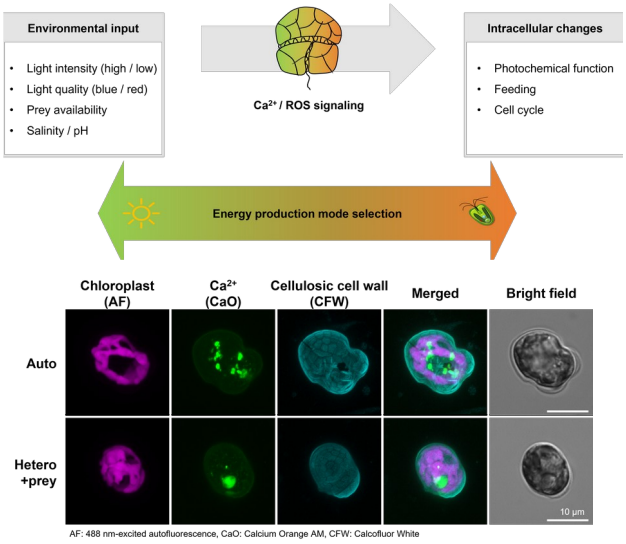
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https://scholar.google.com/citations?user=FNnM97oAAAAJ
https://plantstresslab.com/

REPRESENTATIVE RESEARCH FIGURES / SCHEMES

Dissecting environment-regulated trophic plasticity



Plant-microbe interactions: phytopathogen effector function and recognition

