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Sp21-107

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Funding Source: CAFNR Undergraduate Research Internship

Delineating day length-dependent autoimmune responses in clathrin-coated vesicle mutants

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Agriculture is one of the most important industries that exists to clothe and feed the world, as they are used to make a variety of commodities such as food, fiber, biofuels, and medicine. By understanding how model plants respond to different pathogens, we can translate that knowledge to engineer more resistant plants that may help to reduce crop loss for farmers.

Proteins located in the plasma membrane (PM) play important roles in a plant's ability to perceive and transduce signals between a plant cell and its environment. This includes PM proteins that trigger immune responses upon infection by microbial pathogens. Our lab focuses on vesicular trafficking proteins and their roles in modulating the PM protein composition, so that proteins with immune functions are present in the PM at the right time and in the right abundance for effective immune responses.

Our lab has evidence that in the model plant *Arabidopsis thaliana*, clathrin-coated vesicle (CCV) components contribute to effective immunity against bacterial pathogens. In Arabidopsis, EPSIN is a CCV adaptor protein that recruits clathrin coat components to facilitate transport of PM proteins with immune function from the *trans*-Golgi network to the PM [1]. Here, I provide data showing how in the absence of any stimulus, light stress impacted (auto)immune responses using single and higher-order mutants in *EPSIN1* and genes encoding CCV components. In this study, I quantified the accumulation of a) callose, a beta-1,3-glucan that is deposited outside of the cell as a potential barrier against pathogens and b) mRNA of the immune marker gene *Pathogenesis-related 1 (PR1).* My results indicate that some but not all autoimmune responses in CCV mutants were dependent on the daylength, under which the seedlings were grown.