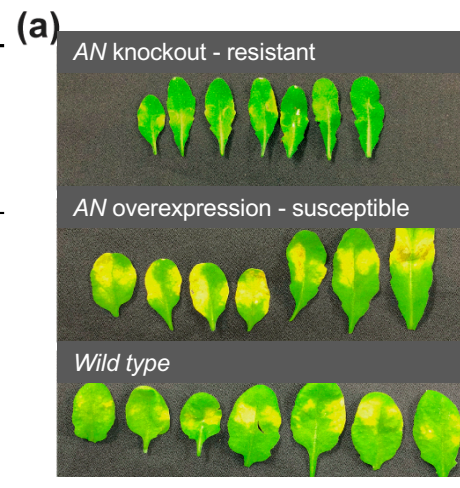


Foundational Genomics Research, PMI SFA

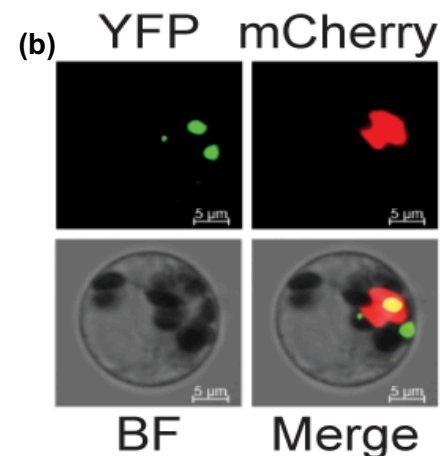
High Impact Publication: Optimizing plant defense against pathogens

Objective	<ul style="list-style-type: none"> Identify genetic factors and the underlying molecular mechanisms that regulate antagonism between salicylic acid (SA) and jasmonic acid (JA) signaling that result in tradeoffs in defense against (hemi)biotrophic and necrotrophic pathogens.
New science	<ul style="list-style-type: none"> A plant homolog of mammalian C-TERMINAL BINDING PROTEIN, designated as ANGUSTIFOLIA (AN), was identified as a key genetic factor regulating plant defense against pathogens in <i>Arabidopsis</i>. AN was shown to be a nuclear protein that functions as a transcriptional repressor. AN antagonistically regulates plant resistance towards (hemi)biotrophic (<i>P. syringae</i>) and necrotrophic (<i>B. cinerea</i>) pathogens by specifically targeting two key genes, <i>MYB46</i> and <i>WRKY33</i>, in the pathogen response pathway. Transcriptional co-regulation and transcriptional reprogramming are required for AN's regulatory role.
Impact	<ul style="list-style-type: none"> A rapid and selective transcriptional reprogramming is central for launching effective host immune responses to microbial infection. This study identified a key genetic factor, AN, that regulates the antagonism and tradeoff between plant defense against (hemi)biotrophic and necrotrophic pathogens and elucidated the underlying molecular mechanism of transcriptional co-regulation and reprogramming. This discovery will inform rational biodesign and genetic engineering to optimize plant defense against pathogens in changing environments.

Xie M, Zhang J, Yao T, Bryan AC, Pu Y, Labbé J, Pelletier DA, Engle N, Morrell-Falvey JL, Schmutz J, Ragauskas AJ, Tschaplinski TJ, Chen F, Tuskan GA, Muchero W, and Chen JG (2020) Arabidopsis C-terminal Binding Protein ANGUSTIFOLIA modulates transcriptional co-regulation of *MYB46* and *WRKY33*. *New Phytologist*, accepted.



AN is a negative regulator of *P. syringae* resistance.



For the first time, AN (green) is shown to localize to the nucleus (red).