

LSU AgCenter – Plant-Pathogen Interactions Laboratory (Fungal Effector Research)
Spring Summer, & Fall 2023
Supervisor/Mentor:
Dr. Ely Oliveira-Garcia (Assistant Professor) Profile: https://www.lsu.edu/agriculture/plant/about/faculty-staff/oliveira-garcia.php
Job Description:
<p>The intern will focus on the functional characterization of <i>Magnaporthe oryzae</i> effector proteins in rice cells during infection. Laboratory experiments will focus on generation of plasmids, fungal transformation, gene knockouts, protein tagging assays. Live cell imaging of fluorescently labeled effectors in rice cells undergoing infection will be performed through super-resolution confocal microscopy. Growth chamber experiments will focus on assessment of the virulence of <i>knockout strains</i> in rice and barley.</p> <p>Special Activities:</p> <ol style="list-style-type: none"> 1. Generation of plasmid vectors <ul style="list-style-type: none"> · Gene knockout and protein tagging cassettes will be generated through cloning techniques previously established in the Oliveira-Garcia and Valent Labs. Transformation of vectors in <i>Escherichia coli</i> and <i>Agrobacterium tumefaciens</i>. Vector sequences will be tested through DNA sequence. 2. Generation of knockout, complemented and strains expressing fluorescently-labeled effector proteins <ul style="list-style-type: none"> · Vectors generated through the Specific Activity 1 will be used to transform <i>M. oryzae</i> using <i>Agrobacterium tumefaciens</i>-mediated transformation. Knockout, complemented and effector-tagged strains will have their cassette integration events into the fungal genome tested through PCR and Southern Blot. 3. Live expressing fluorescently-labeled effector proteins <ul style="list-style-type: none"> · Rice cells undergoing infection by <i>M. oryzae</i> strains expressing fluorescently-labeled effectors (Specific Activity 2) will be evaluated through confocal microscopy. 4. Fungal Virulence/Host Resistance Trials <ul style="list-style-type: none"> · Inoculation of rice and barley with knockout and complemented strains (Specific Activity 2) to determine the role of the gene for fungal virulence.
Responsibilities/Roles:
Students will be responsible for conducting experiments related to the Specific Activities 1-4 under the supervision of Dr. Oliveira-Garcia and with the support of a Research Associate (technician) and graduate students.
Requirements/Qualifications:
Bachelors in Biology, Chemistry, Agronomy or close related fields.
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