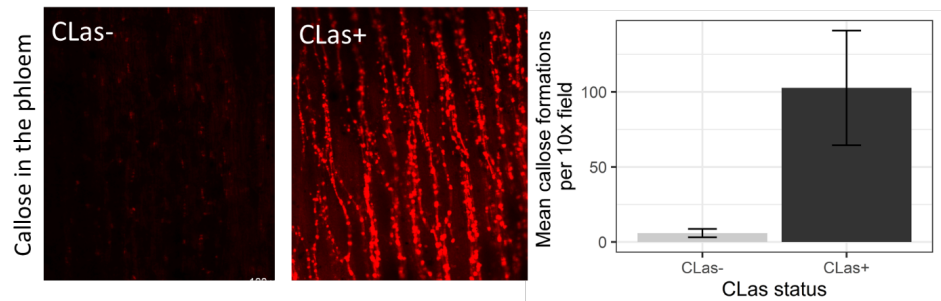


Unraveling CLas Phloem Interactions

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Our goal is to identify targets for gene editing to generate citrus tolerance to HLB. HLB progression is tightly associated with phloem plugging in the stem, leading to inhibition of sugar and nutrient transport into sink tissues, including the fruit. Eliminating these plugs will presumably result in renewed sugar transport and increased yields. However, there is a significant gap in our understanding of CLas phloem interactions in citrus, which has been a major limiting factor for controlling the disease. This gap

results from the phloem being a narrow tissue buried inside the stem, and the low and inconsistent titers of CLAs in tissues studied so far. To address these challenges, we established a novel seed coat-based system that supports in-depth analyses of phloem dynamics and CLas-phloem interactions in HLB-affected citrus. This system is based on extracting vasculature from HLB trees seed coat with 100% of the tissues containing extraordinarily high titers of CLAs. We are employing this system to identify key players

required for phloem plugging, host immune response and CLas colonization inside the phloem. These key players will become novel targets for manipulation with gene editing techniques that can be translated into usable products, such as transgene-free CRISPR/Cas9 edited plants to block CLas propagation and movement or increase sugar and nutrient translocation into fruit thus increasing tolerance or resistance to HLB.

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