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Exploiting the Las and Lam phage for potential control of HLB

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Huanglongbing (HLB) is a lethal disease of citrus caused by *Ca*. L. asiaticus (Las), *Ca*. L. americanus (Lam), and *Ca*. L. africanus. Our published results demonstrate that Las carries a prophage with a lytic cycle that can become activated in plants to kill the Las cell that carries it. Our more recent results analyzing the complete genome of Lam (refer Wulff *et al* abstract at this conference) demonstrates that it, too, carries a very similar prophage and apparent lytic cycle. Our goal is to try to develop a sensitive, multiwell, microtiter dish assay for high throughput screening of chemicals with ability to trigger the lytic cycle and potentially lead to a chemical treatment method to eliminate Las from infected trees, whether symptomatic with HLB or not. The intergenic region between the early and late genes of Las phage SC1 and SC2 (between locus tags gp120 and gp125) were cloned in both directions upstream of the *lacZ* reporter gene in *E. coli*. We then cloned and expressed predicted repressors and anti-repressors from Las to determine responsiveness of the reporter constructs. As expected, the predicted early gene reporters of both SC1 and SC2 were constitutively on and the late genes were constitutively off. However, the predicted repressors and antirepressors failed to function as predicted and a detailed examination of the intergenic region revealed that late gene expression is likely initiated in at least one other location. Additional putative late gene promoter regions are being analyzed.

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