Antibacterial FANA Oligonucleotides as a Novel Approach for Managing the Huanglongbing Pathosystem

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This project evaluated a new technology, FANAs (2′-deoxy-2′-fluoro-D-arabinonucleic acid antisense oligonucleotides), to control the HLB-causing bacteria within both psyllids and citrus trees. The intent was to find alternative, environmentally-friendly tools for psyllid management as current pest management strategies have led to the development of resistance among ACP populations. We reduced transmission of HLB by using FANAs to target the HLB causing bacteria within psyllids and citrus trees. FANAs are compounds that can be used to silence genes within ACPs and in the bacterial pathogen that causes citrus greening disease. We demonstrated that FANAs could be used to control ACP by targeting the naturally occurring bacteria inside the psyllids needed for their survival. We were able to reduce the citrus greening disease pathogen in the psyllid and in citrus, leading to less transmission and a potential reduction in disease severity. The benefit of this technology is that it can be designed to target specific bacterial cells in contrast to broad-spectrum antibiotics. Our results suggest that FANA ASO may be a useful tool for integrated management of HLB.

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