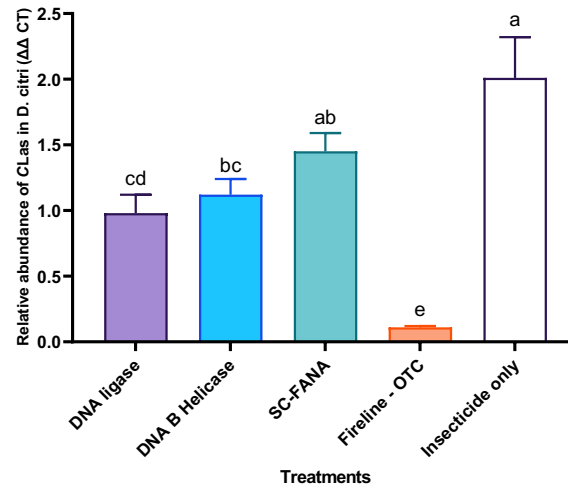


# Antibacterial FANA Oligonucleotides as a Novel Approach for Managing the Huanglongbing Pathosystem

**Researchers:** Kirsten Pelz-Stelinski

**Contact:** Kirsten Pelz-Stelinski,  
pelzstelinski@ufl.edu

UF/IFAS CREC



Acquisition of CLAs by Asian citrus psyllid nymphs feeding on mature citrus trees treated by trunk injection with various antimicrobial treatments including FANA oligonucleotides targeting CLAs (DNA ligase and helicase)

## Take Home Message:

- FANA mediated silencing may disrupt CLAs transmission.
- FANA ASOs decreased CLAs acquisition by ACP adults and nymphs compared with insecticide-treated trees.
- FANA ASO-ligase and B-helicase reduced CLAs in trees and results were comparable to trunk-injections of oxytetracycline in summer months.

**Effort Statement:** Collected additional data on fruit yield and quality.

**Summary:** This project evaluated a new technology, FANAs (2'-deoxy-2'-fluoro-D-arabinonucleic acid antisense oligonucleotides), to control the huanglongbing (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 HLB. 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 HLB 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 HLB management.

## Funding:

 National Institute of Food and Agriculture  
U.S. DEPARTMENT OF AGRICULTURE