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### Title

Targeting juvenile hormone metabolic genes in the Asian citrus psyllid (*Diaphorina citri* Kuwayama) as a strategy to reduce the spread of citrus greening disease

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**Targeting juvenile hormone metabolic genes in the Asian citrus psyllid (*Diaphorina citri* Kuwayama) as a strategy to reduce the spread of citrus greening disease**

Van Ekert, E., Borovsky, D., Powell, C.A., Cave, R.D., Alessandro, R.T., and Shatters, R.G., Jr.

*Diaphorina citri* Kuwayama, the Asian citrus psyllid (ACP), is a devastating citrus pest due to its transmission of a phloem-limited bacterial pathogen, *Candidatus Liberibacter asiaticus*, that causes citrus greening. Psyllid control is a major part of effective greening disease management, and our research targets perturbation of insect juvenile hormone metabolism as a new psyllid control strategy. Previous studies have shown that application of a juvenile hormone (JH) analogue, pyriproxyfen, is known to produce ovicidal/nymphicidal effects, morphological abnormalities, and reduced fecundity in ACP adults. These observations prompted us to identify JH biosynthetic and degradative pathways as targets for biologically-based control strategies, including RNA interference, as alternatives to heavy reliance on broad-spectrum pesticides. First, candidate genes/cDNAs encoding the JH metabolic enzymes, juvenile hormone acid methyl transferase (JHAMT) and juvenile hormone esterase, were identified through computational analysis of the *D. citri* genome. Second, JHAMT cDNA was cloned, expressed in *E. coli* and a functional protein was purified. This JHAMT had a high affinity for substrates leading to JHI and JHIII synthesis, making it plausible that both juvenoids are present in the ACP. Results are discussed with respect to mechanism(s) of juvenile hormone biosynthesis/catabolism in the ACP and targeting this process as an interdiction point for a bio-rational ACP control strategy.