Public Abstract
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Graduation Term:SS 2017
Department:Plant, Insect and Microbial Sciences
Degree:MS
Title:ESTABLISHING, CHARACTERIZING AND DEPLOYING NOVEL INSECT CELL LINES

Insect cell lines are convenient and powerful tools that were initially used in viral propagation, optimization of viral pesticides, cell-virus interactions, and recombinant protein productions. The most commonly used cell lines were initiated from embryonic tissues, nervous system, and ovarian tissues. Although the midgut is known as the main entry of pathogens and pest control chemicals, few cell lines have been established from midgut tissues of economically important pests. My project focused on establishing midgut cell lines from four select species, including western corn rootworm, southern green stinkbug, green stinkbug, and fall armyworm. I in total initiated 317 cell cultures from the four insect species, of these 21 promising cell cultures are still being carefully maintained. I established two midgut cell lines from the fall armyworm that are continuously replicating. Additionally, experiences and new insights of cell culture initiations from western corn rootworm and (southern) green stinkbug were gained. Characterization of the two SfMG cell lines verified their identities belonging to S. frugiperda. The doubling time of the two cell lines indicate they are relatively fast replicating. I optimized the cell cytotoxicity assay based on cell sensitivity and linear relationship for use in future toxin-screening assays.