A Two Year Study to Initiate and Characterize a Cell Culture of the Native Pollinator Bombus impatiens: Applications in Entomology, Agriculture, and Nosema Research

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ABSTRACT Bumble bee (Bombus spp.) populations are declining nationally as well as globally due to a variety of factors including habitat loss, pathogens, and immune deficiencies. Because of the complexity of these issues and sensitivity of bumblebees, innovative research tools are necessary to understand and create solutions to the threats facing these insects, which provide valued ecological services as pollinators. Insect cell lines facilitate replicative specific, controlled conditions in an in vitro environment that are impossible to create in the whole insect specimen. Cell lines may be ideal tools to develop for Bombus research. A Bombus cell line resource would create a new field of specialized research at the cellular level, and this resource could bring scientists closer to understanding the ecological interactions contributing to Bombus decline. Over the last year, I initiated cell cultures using isolated tissues, which led to valuable new information about Bombus cell culture; this year, employing knowledge gleaned from the initial phase, cultures were established using eggs, larvae, and pupae via using media that were favorable in past experiments including: CLG#2, L-15B, and WH5. Two embryonic cultures established on 10/06/17 are currently growing and have been passaged once as of the date of publishing. This is the first time a primary bumblebee cell line has reached the point of a first passage. These preliminary results indicate great progress towards the establishment of a continuous culture.

Awards Won:
Third Award of $1,000