The Establishment of a Permanent Cell Line of the Native Pollinator Bombus impatiens: Applications in Entomology, Agricultural Science, and Nosema Research

Kline, Olivia

Bumble bee (Bombus spp) populations are declining nationally and globally. There are a multitude of factors which are hypothesized to contribute to this decline such as habitat loss, pathogens, and immune deficiencies. Due to the complexity of these issues and sensitivity of these insects,innovative research tools must be developed in order to understand and create solutions to the imminent threats that face these integral pollinators. A resurgence in the popularity of insect cell lines-due to their capability to replicate specific, controlled conditions, in an in vitro environment that are impossible to create when studying the whole insect specimen- makes them an ideal tool to develop for Bombus research. A Bombus cell line resource would create a whole new field of specialized research on the cellular level in the Bombus research field, and this resource could bring scientists one step closer to being able to understand the extremely complex interactions that occur in ecosystems that contribute to Bombus decline.To begin to establish this continuous culture, primary tissue cultures were initiated from aortic,nervous, ovarian, fat body, and full body tissue extractions from drones, workers, mated queens, virgin queens.and larvae. A variety of media were used in various cultures including: Ex-Cell 420, CLG2, Tn-MFH, TRL14, and Schneiders. Currently thirty cultures have been initiated; seventeen of which are healthy and actively growing.

Awards Won: