Technische Universität Braunschweig

Masterarbeit

Establishment of a cell culture model for honey bee (*Apis mellifera*) virus studies.

DSMZ

Background

The Western honey bee *(Apis mellifera*) is the most important managed pollinator and a model for social insect studies. A diverse array of viruses are among the many stressors that contribute to the ongoing honey bee health crisis. Yet, honey bee virology is a scientific field that is still emerging and it is lacking fundamental tools for mechanistic molecular studies, such as a publicly available, immortalized cell line. The development of a novel cell line from honey bees would thus be a transformative step for the field. However, the establishment of a permanent, experimentally suitable cell line is not trivial, requiring a multidisciplinary approach, dedication, and ingenuity.

Objectives

The initial objective of this master's thesis is to set-up primary cell cultures from a variety of biological bee source material. The second objective is to biologically characterize the resulting cells and their proliferation potential. The final goal is to successfully passage and cryopreserve the generated cell cultures to provide starting material for the establishment of a permanent cell line of *Apis mellifera* to enable research on honey bee viruses and other applications.

Main methodology

Different tissue material of the honey bee will be collected (either by you or the partners at the JKI), frozen and cultivated. Freezing methods and cultivation conditions will be tested to establish a working practice. Cells will be characterized by determination of cell viability and various cell proliferation assays, COI barcoding, RT-PCR, and possibly karyotyping. After a cell line is successfully established, studies of virus infections could follow.

The groups

The project is a joint initiative between a guest scientist of the University of Alberta at the department Human and Animal Cell Lines at the Leibniz Institute DSMZ at the Science Campus Braunschweig-Süd and the Institute for Bee Protection at the Julius Kühn-Institute (JKI) in Braunschweig. The bee work will be conducted at the JKI, whereas cell cultivation will be done at the DSMZ.

Start: As soon as possible

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