Please, join us for the upcoming seminar Today, June 2nd.

Our speaker is Mrs. Shany Cohen,

Transovarial transmission, gene silencing and editing in embryos of invertebrate.

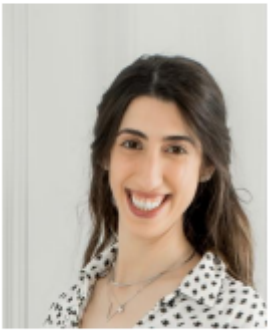
June 2nd, Building 51 – Auditorium Nano, at 14:10

אוניברסיטת בן-גוריון בנגב

Ben-Gurion University of the Negev

Avram and Stella Goldstein-Goren Department of Biotechnology Engineering

SEMINAR



Mrs. Shany Cohen

PhD student at Dr. Isam Khalaila's Laboratory of sugar and biochemical mechanisms of diseases, Avram and Stella Goldstein-Gorn Department of Biotechnology Engineering, Faculty of Engineering Sciences, Ben-Gurion University of the Negev, Beer-Sheva.

June 2nd, 14:10, Building 51 – Auditorium Nano

Transovarial transmission, gene silencing and editing in embryos of invertebrates

This study aims to gain a comprehensive insight into transovarial transmission in crustaceans that could be utilized for large-scale gene-silencing and editing for developmental biology studies and for the manipulation of biotechnology-relevant genes or for the transmission of anti-pathogen molecules to impact populations for advanced sustainable crustacean aquaculture.

Oviparity is a form of reproduction that involves egg production and laying. Since the embryo is developing outside the female body, the egg should contain sufficient nutrients for its development. In a process known as vitellogenesis, vitellogenin (Vg), a precursor of the yolk protein vitelline, is synthesized and accumulated in the ovary as vitelline. Previous work in our lab revealed a specific 24 amino acid peptide sequence derived from vitellogenin that has the characteristics of binding to the vitellogenin receptor. During the current study, the short 24 amino acid peptide was found to interact with the vitellogenin receptor and specifically inter the oocyte in vitro and in vivo. Based on this peptide, an Oocyte-Specific Delivery (OSDel) vehicle was established. The vehicle proved capable of delivering dsRNA and small molecules into crustacean oocytes. Moreover, a protein Chimera composed of the vitellogenin-derived peptide and a dsRNA binding protein domain named Oocyte Specific Silencing Chimera (OSSCot) was designed and produced. Both tools induce gene silencing in crustacean embryos, offsprings of treated mothers. Based on the established vehicles, a transovarial transmission experiment of anti-WSSV dsRNA was performed in shrimp, and the offspring's resistance to WSSV was examined. Embryos from both OSDel and OSSCot-treated female groups were found to be more tolerant to the virus. Moreover, those offspring demonstrated an "uninfected" diagnosis compared to the control groups. These results pave the way for developing a novel vaccination strategy against the major burden in shrimp aquaculture.

Host:
Rachel Lichtenstein ruha@bgu.ac.il