



Ben-Gurion University of the Negev
Jacob Blaustein Institutes for Desert Research
The Swiss Institute for Dryland Environmental and Energy Research
Mitrani Department of Desert Ecology

Seminar

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Tuesday, January 9, 2018, 12:00

Seminar Room, Old Administration Building

Participants are invited to meet the seminar speaker at the MDDE meeting room immediately after the seminar (~ 13:00). Please bring your lunch; snacks will be provided.

Lessons in Mind Control: Trends in Research on the Mechanisms Behind Parasite-Host Behavioral Manipulation

Neuro-parasitology is an emerging branch of science that deals with parasites that control the nervous system of the host. The ability of parasites to alter the behavior of their hosts has recently generated an unusual interest in both scientists and non-scientists. Although the alteration of host behavior by parasites is a widespread phenomenon, underlying mechanisms are only beginning to be deciphered. The most fascinating examples of behavioral manipulation are seen in arthropods parasitized by various species of parasitoid wasps. These wasps manufacture venoms to manipulate the host nervous system in ways that are tailored to the developmental needs of their offspring. After a brief introductory survey of the most fascinating behavioral manipulation, I will dwell on our model system: the cockroach wasp parasitic association. The parasitoid jewel wasp hunts cockroaches to serve as a live food supply for its offspring. The wasp stings the cockroach in the head and delivers a neurotoxic venom cocktail directly inside the prey's cerebral ganglia to apparently 'hijack its free will'. Although not paralyzed, the stung cockroach becomes a living yet docile 'zombie' incapable of self-initiating walking or escape running. In this presentation, we will show that the venom contains components that are aimed at modulating specific circuits to the benefit of both the wasp and its offspring. In this respect, the wasp is taking advantage of neurotransmitters and neuromodulatory systems present in the host to induce a sequential and adaptive behavioral manipulation.