

The Mina & Everard Goodman
Faculty of Life Sciences
Bar-Ilan University

Dr. Alice Robie

HHMI Janelia Research Campus

**Mapping the neural substrates of behavior
using machine learning: a brain-
behavior atlas for *Drosophila melanogaster***

(The presented study was just out on Cell)

Tuesday, September 12th 14:00

Nanotechnology Center Building 206 seminar room 9th floor

Abstract: Assigning behavioral functions to neural structures has long been a central goal in neuroscience and is a necessary first step toward a circuit-level understanding of how the brain generates behavior. Here, we map the neural substrates of locomotion and social behaviors for *Drosophila melanogaster* using automated machine-vision and machine-learning techniques. From videos of 400,000 flies, we quantified the behavioral effects of activating 2,204 genetically targeted populations of neurons. We combined a novel quantification of anatomy with our behavioral analysis to create brain-behavior correlation maps, which are shared as browsable web pages and interactive software. Based on these maps, we generated hypotheses of regions of the brain causally related to sensory processing, locomotor control, courtship, aggression, and sleep. Our maps directly specify genetic tools to target these regions, which we used to identify a small population of neurons with a role in the control of walking.

Host: Dr. Galit Shohat-Ophir

galit.ophir@biu.ac.il