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Synapse-level Connectomics: Reconstruction of a Mini-insect

Thursday, June 11, 2020 12:00 PM (30 minutes)

Maps of synaptic connections between neurons, or connectomes, provide crucial information for reverse engineering the brain. We developed a semi-automated image processing pipeline to reconstruct the connectome from serial electron micrographs. We report first results from the connectome of Megaphragma amalphitanum, a microscopic wasp whose linear size is an order of magnitude smaller than that of Drosophila. One peculiar feature of the Megaphragma is that most neurons lack nuclei. We find that the few neurons with nuclei occupy stereotypical positions in the connectome suggesting that their function requires genetic information.

Joint work with the groups of Alexei Polilov (Moscow),
Harald Hess (Janelia), and Viren Jain (Google).