Seminar/Talk

Using automated image analysis to quantify interactions from the synapse to the network level

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Host: Peter Jonas

Interactions between molecules in cells and between cells in tissues are the basis of complex higher-level function at the systems level. Modern light and electron microscopic techniques enable us to capture these interactions in unprecedented detail and with high temporal and spatial resolution, but require new automated ways to extract relevant information from the vast amount of image data. We develop and apply computational methods for automated image and network analysis, aiming towards a quantitative understanding of multicellular interactions in neuronal and other tissues. I will present our work on segmentation of synaptic structures from electron microscopic images using machine learning, clustering of neuronal proteins from 3D superresolution microscopy, and on the analysis of network structure in bone cell networks. Based on the quantitative information from such large-scale image data, we develop theoretical models and generate new hypotheses on the structure and function of complex biological networks on all scales.

Thursday, October 19, 2017 10:00am - 11:00am
Seminar Room, Lab Building East

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