ASHBi SEMINAR

The cortical network processing three-dimensional object structure in the human and nonhuman primate brain

Lecturer: **Dr. Peter Janssen**

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Time: 17:00–18:00
Venue: seminar room 107, Faculty of Medicine Bldg. D

Our world consists of three-dimensional (3D) objects. The primate visual system devotes considerable resources to analyze the 3D structure of objects defined by binocular disparity, both in the dorsal and in the ventral visual stream. I will review a series of studies in extrastriate cortex of the macaque monkey, i.e. in inferotemporal cortex (ITC) and the anterior intraparietal area (AIP). These studies have investigated the functional Magnetic Resonance Imaging (fMRI) activations related to 3D structure defined by binocular disparity, the properties of single neurons selective for 3D structure, the correlation between neural activity and the perceptual report of the animal, and how electrical microstimulation and reversible inactivation of clusters of neurons influence perceptual decisions on 3D structure. Microstimulation and reversible inactivation studies during fMRI also shed light on the flow of visual information in the network processing 3D object structure. To understand how the visual system achieves these 3D object representations, we have investigated the neural representation of 3D structure in mid-level visual areas (PIP in the dorsal stream and TEO in the ventral stream), guided by fMRI studies in monkeys. Finally, I will present new data obtained using intracortical recordings in human visual cortex, which may shed light on the homology between monkey and human areas . Together, single-cell, imaging and perturbation studies in monkeys, combined with imaging and single-cell recordings in humans, provide insight into the unique role of the dorsal and ventral visual stream, and the widespread cortical networks that support 3D object vision.

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