

Internal Seminar

A chemical strategy for the targeted imaging and manipulation of homeostatic microglia in living brains

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Microglia are resident innate immune cells of the central nervous system. Under physiological conditions, homeostatic microglia continuously scan their surroundings to interact and to ensure the proper functioning of neurons, astrocytes, and blood vessels. The critical role of microglia in brain circuit development and in neurodegenerative diseases such as Alzheimer's disease (AD) and disease (PD) is currently emerging, Parkinson's with new opportunities in targeted modulation of microglia. Microglia is mostly refractory to genetic modifications, which limits our understanding of these cells in live human tissues and in animals. Currently, we lack robust molecular tools to specifically image and modulate microglia in vivo, which presents a major hurdle in our understanding of the brain-wide functions of these cells during the early onset of brain diseases. In this presentation, I will discuss the design and development of small molecule-based probes to target and label microglia-specific G-Protein-Coupled Receptor (GPCRs) proteins using ligand directed protein labelling chemistry. I will also discuss on how we employed this technology to image various morphological states of microglia in adult mice and visualise microglia-pathogen interactions in living organism (zebrafish).

Friday, Jun 13th 2025 14:30 Hrs Seminar Hall, TIFRH