Institutul Național de Fizică și Inginerie Nucleară
Horia Hulubei

IFIN-HH

Seminar general

Intravital microscopy for the study of leukocyte trafficking in brain diseases

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The migration of leukocytes from the blood stream into the central nervous system (CNS) is a key event in the pathogenesis of inflammatory neurological diseases and typically involves the movement of cells through the endothelium of post-capillary venules, which contains intercellular tight junctions. Imaging leukocyte trafficking in the CNS can be achieved by epifluorescence intravital microscopy (IVM) and multiphoton microscopy.

Epifluorescence IVM is ideal for the investigation of leukocyte–endothelial interactions, particularly tethering and rolling, integrin activation and arrest in CNS vessels. Multiphoton microscopy is more suitable for the investigation of intraluminal crawling, transmigration and motility inside CNS parenchyma. The mechanisms of leukocyte trafficking in the CNS are not well understood, but the use of in vivo imaging techniques will provide insight into the mechanisms of brain damage and may contribute to the development of novel therapeutic strategies.

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