Antigen

In immunology, an antigen (Ag), abbreviation of antibody generator, is any structural substance which serves as a target for the receptors of an adaptive immune response, TCR or BCR or its secreted form antibody, respectively.

Unlike every other organ in the body, the brain parenchyma lacks a traditional lymphatic system to drain fluids and central nervous system (CNS) antigens. It was historically assumed that all brain wastes were removed by endogenous processing, such as phagocytosis and autophagy, while excess fluids drained directly into the blood. However, the twin discoveries of the glial-lymphatic (glymphatic) system and meningeal lymphatics have transformed our understanding of brain waste clearance. The glymphatic system describes the movement of fluids through the subarachnoid space (SAS), the influx along periarterial spaces into the brain parenchyma, and the ultimate efflux back into the SAS along perivenous spaces where it comes into direct contact with the meningeal lymphatics. The dura mater of the meninges contains a bona fide lymphatic network that can drain CSF that has entered the dura. Together, these pathways provide insights into the clearance of molecules and fluids from the brain, and show that the CNS is physically connected to the adaptive immune system. [1)]

1)
Smyth LCD, Beschorner N, Nedergaard M, Kipnis J. Cellular Contributions to Glymphatic and Lymphatic Waste Clearance in the Brain. Cold Spring Harb Perspect Biol. 2024 Aug 12:a041370. doi: 10.1101/cshperspect.a041370. Epub ahead of print. PMID: 39134379.