TSPO Ligand YL-IPA08 Promotes Brain Recovery Post-Stroke by Inhibiting Microglia-induced Neuroinflammation

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Abstract:

Microglia activation plays a pivotal role in the progression of ischemic stroke by driving neuroinflammation and a cascade of pathological events. However, effective targets for regulating neuroinflammation in the acute phase following stroke remain unidentified. By integrating single-cell RNA sequencing (scRNA-seq) and spatial transcriptomics (ST) data, we found that the expression of translocator protein (TSPO) was elevated in activated microglia within the peri-infarct area of stroke model mice. In this study, we demonstrate that the TSPO ligand YL-IPA08 reduced the volume of brain infarction and promoted the recovery of cognitive and motor functions in stroke model mice. Experimental results show that YL-IPA08 administration inhibited microglial and astrocyte activation, repaired the blood-brain barrier, and enhanced neuronal plasticity. Collectively, these findings suggest that YL-IPA08 holds promise as a therapeutic agent for ischemic stroke by targeting TSPO.

Keywords:

TSPO, YL-IPA08, microglia, scRNA-seq, ischemic stroke