Symposium | Schizophrenia：[Symposium 75] Current Topic of Biological Psychiatry: Synapse, Glia and Inflammation

Sat. Sep 27, 2025 3:50 PM - 5:20 PM JST | Sat. Sep 27, 2025 6:50 AM - 8:20 AM UTC Session Room 4 (Large Hall B)

[Symposium 75] Current Topic of Biological Psychiatry: Synapse, Glia and Inflammation

Moderator: Takahiro A. Kato (Department of Psychiatry, Hokkaido University Graduate School of Medicine), Shigenobu Kanba (Kyushu University)

[SY-75-01] Reverse translational research using human blood induced microglia-like (iMG) cells: Are microglia causing fires in the brain?

*Takahiro A. Kato[1] (1. Department of Psychiatry, Hokkaido University Graduate School of Medicine (Japan))

Keywords：microglia、inflammation、reverse-translational research

Microglia play crucial roles of inflammation in the brain. Postmortem brain analysis and PET imaging analysis are two major methods to assess microglial activation in human, and these studies have suggested activation of human microglia in the brain of patients with various neurological and psychiatric disorders. However, by using the above methods, only limited aspects of microglial activation can be measured. We have originally developed a technique to create directly induced microglia-like (iMG) cells from fresh human peripheral blood monocytes adding GM-CSF and IL-34 for 2 weeks, instead of brain biopsy and iPS technique (Ohgidani, Kato et al. Sci Rep 2014). Using the iMG cells, dynamic morphological and molecular-level analyses such as phagocytosis and cytokine releases after cellular-level stress exposures are applicable. Recently, we have confirmed the similarity between human iMG cells and brain primary microglia by RNAseq (Tanaka, et al. Front Immunology 2021). We believe that patients-derived iMG cells will take a role as one of the important surrogate markers to predict microglial activation in patients with various neurological and psychiatric disorders. In this symposium, we will introduce our latest findings using iMG cells with such patients.We have already revealed previously-unknown dynamic pathophysiology of microglia in patients with Nasu-Hakola disease (Sci Rep 2014), fibromyalgia (Sci Rep 2017), rapid-cycling bipolar disorder (Front Immunology 2017) and Moyamoya Disease (Sci Rep 2023). The iMG cells can analyze both state- and trait- related microglial characteristics of human subjects by repeated blood collection, which is especially valuable because majority of psychiatric disorders express situation- and time- oriented symptoms.We believe that the iMG techniques shed new light on clarifying dynamic molecular pathologies of microglia in a variety of neuropsychiatric and other brain disorders.