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Poster Sessions

Three-dimensional co-culture model using human iPSC derived brain organoid and microglia-like cellsMayuko Takata, Kaneyasu Nishimura, Kazuyuki Takata*Div. Integ. Pharm. Sci., Kyoto Pharm. Univ., Kyoto, Japan*

Alzheimer's disease (AD) is an age-related neurodegenerative disease that is characterized by formation of amyloid- β ($A\beta$) plaque and neurofibrillary tangle. These pathological events cause neural cell death and progressive cognitive impairment. While, microglia are the resident macrophages of central nervous system and have the function of $A\beta$ phagocytosis. Although AD animal models have been used to investigate pathophysiology of AD, they show limitations on recapitulating the complexity of human brain microenvironment. Especially, interaction of neurons and microglia is still poorly understood in both normal and AD. Here we generated 3D co-culture organoid system mimicking human brain microenvironment with human induced pluripotent stem cell (iPSC)-derived cerebral organoid and primitive macrophages. First, we separately generated cerebral organoids and macrophage from iPSCs and co-cultured them in single dish. The organoid expressed cerebral cortex-specific genes and showed multi-layer structure, and primitive macrophages exhibited microglia-like morphology and interacted with the neurons in the organoid. Therefore, 3D co-culture system is useful model for greater understanding interaction of neurons and microglia. Our 3D co-culture model system will be also applicable for AD modeling and developing novel therapies against AD.