Hiroko Ikeshima-Kataoka

Keio University School of Medicine, Japan

Osteopontin has Neuroimmunological function for reactivation of Astrocytes and Microglial cells in stab wounded mouse Brain and LPS stimulated primary culture

Osteopontin (OPN) is an inflammatory cytokine inducer involved in cell proliferation and migration in inflammatory diseases, injuries or tumors. To clarify the functional role of OPN in reactivation of astrocytes during brain injury, we compared OPN-deficient (OPN/KO) with wild type (WT) mouse brains after stabbing wound injury on the cerebral cortex as a brain traumatic injury model. Furthermore, primary culture of astrocytes or microglial cells from either genotype of postnatal mouse brains was prepared and treated with lipopolysaccharide (LPS) to induce inflammation in the cells. By the immunofluorescent analysis on the injured brain sections, either astrocytes or microglial cell activation was attenuated in OPN/KO mice compared with WT mice confirmed with bromo-deoxy urine incorporation as a cell proliferation marker. Activation efficiency of astrocytes in primary culture was accessed using Western blotting analysis by examining the protein expression levels of glial fibrillary acidic protein (GFAP) and tenascin-C (TN-C), which are the markers for reactive astrocytes. The expression levels of both GFAP and TN-C were downregulated in the primary culture of astrocytes from OPN/KO mice compared to that from WT mice. Additionally, primary culture of astrocytes prepared from OPN/KO mice showed only 25% of normal shaped astrocytes in a flask were produced compared to that from WT mice. These data suggest that OPN is essential for proper astrocytic generation in vitro culture prepared from mouse cerebral cortex. Moreover, OPN is indispensable for astrocyte activation in the mouse brain injury model and in LPS stimulated primary culture.

Speaker Biography

Hiroko Ikeshima-Kataoka was graduated from Keio University School of Medicine (Dept. of Microbiology) and got Ph.D. on the functional analysis of calmodulin genes using transgenic mice. At the National Institute of Neuroscience, researched on the molecular mechanism of neuronal development using fly genetics. Then, promoted back to Keio University School of Medicine) and started to focus on the "reactive astrocytes" in injured mouse brain. At Jikei University School of Medicine, aimed on neuroimmunological analysis in mouse brain and primary culture. Promoted back again to Keio University School of Medicine (Dept. Pharmacology and Neuroscience) and found important molecules concerned in neuroimmunological functions of astrocytes. Now, using in vivo imaging on mouse to analyze functional role of "reactive astrocytes" at Waseda University, Faculty of Science and Engineering.

e: hilocoikeshima@gmail.com

Notes: