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Dah-Yuu Lu

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Research Interest

• Neuroosciences
• Neuroinflammation
• Neurodegeneration
• Brain Tumor
• Neuropharmacology
• Neuropsychoimmunology
The roles of microglia in neuroinflammatory responses

• Interested in examining the types of agents that may potentiate the inflammatory responses in microglia.

• In recent years, it have been demonstrated that, except gram-negative bacterium, peptidoglycan, a gram-positive bacterium can regulate anti-and pro-inflammatory responses in microglia by using in vivo or in vitromodels.
A considerable amount of research has shown that microglial inflammation has a crucial role in neuronal cell damage. Accordingly, I have started to take more critical perspectives on the reciprocal effects between neuropsychopathology and microglial inflammation. With respect to the early identification of microglial inflammation, the up-regulation of CXCR4 receptors and other inflammatory cytokines such as AMPK, iNOS, or HO-1 in microglia appear to mediate neuronal cell damage. Thus, I have begun to address the pharmaceuticals that have potentials to prevent excessive microglial inflammation in terms of neuroprotection.
Mechanisms underlying neurodegenerative diseases

- By using hypoxia model, it was previously found that the elevated level of MMP-9 and MMP-13 in astrocyte can enhance permeability of brain endothelial cells which have a role in neurodegenerative diseases. The cytoprotective effect of astrocytes to neurons is also shown by up-regulation of HO-1 with the administration of berberine. With respect to neuro-protection, the antidepressant, desipramine, also appears to regulate HO-1 through ERK and JNK pathways in dopaminergic cells, which postulates an insight for neuro-psycho-protection.
Mechanisms of glioma-associated neuro-oncology

- Concerning that glioma is a highly aggressive malignant tumor with poor prognosis, I am very interested in the issue surrounding the glioma development, growth and migration in terms of how gliomas are developed and what factors that modulate glioma cell migration. I have previously found that ghrelin, which is a gastric peptide, and IL-18 can promote migratory activity in glioma cells. Recently, I have shown the effect of GDNF on glioma cell motility. The higher GDNF levels are also identified in both colon and oral cancer cells, by which GDNF can serve as a diagnostic indicator for glioma cell migration.
• I am also seeking for Chinese herbals that can trigger inhibitory effect on glioma cells. Prenylphloroglucinol derivatives (BFP) and wogon in have been successfully shown to exert ER stress in glioma cells. In addition to my research, I am collaborating with clinicians from Tzu Chi Hospital, China Medical University and Dr. Chih-Hao Lee from Harvard University to examine whether the metabolic syndrome, and different types of neuropathology might contribute to neuroinflammation.
Cell Science & Therapy
Related Journals

- Cell & Developmental Biology
- Single Cell Biology
- Journal of Stem Cell Research & Therapy
Cell Science & Therapy
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