Inflammation and lysosomal enzymes: Connection in prevention of cognitive decline

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Statement of the Problem: As the life expectancy continues to increase, the cognitive decline associated with aging and Alzheimer's disease (AD) is becoming the major issue around the world. Microglia, resident mononuclear phagocyte population in the brain, are activated either chronically or pathologically to influence the neuronal environment. The microglia-mediated neuroinflammation is closely associated with cognitive functions during aging and AD. Furthermore, systemic inflammation is considered to promote neuroinflammation.

Findings: We have explored that lysosomal enzymes involve in neuroinflmmations and systemic inflammation. Cathepisn (Cat) B involves in IL-1β production in microglia in the brain of AD patients, which IL-1β is known as the master regulator of neuro inflammation. Recently, we have found that Cat B plays the critical roles in inducting Alzheimer's disease-like phenotypes in brain, and Cat S plays the critical roles in amplifying systemic inflammation in mice following chronic systemic exposure to LPS from *P. gingivalis* (an oral pathological bacterium for periodontitis). More recently, we have found that intervention of inflammation prevents the cognitive decline in elderly human.

Conclusion & Significance: In the present talk, author will review the multiple roles of lysosomal enzymes in inflammation, particularly focus on Cat B and Cat S. He will believe that understanding the novel mechanisms of lysosomal enzymes in inflammation will provide an effective approach for preventing cognitive decline associated with aging and AD, thus contribute to "Health life span extension".

Biography

Zhou Wu, is Chair of department of Aging Science and Pharmacology, Faculty of Dental Science at the Kyushu University at Fukuoka, Japan. His research is particularly interested in the roles of lysosomal enzymes (cathepsins) in inflammation which result in cognitive decline during aging and Alzheimer's disease. His current works clarify the critical roles cathepsins in *P. gingivalis* related periodontitis in onset and pathological process of Alzheimer's disease. He is also researching the inflammation regulation by nature production; aim to innovate the early intervention approaches for cognitive decline prevention.

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