Doctoral thesis/dissertation Digest Form

Thesis/dissertation Title

The role of IRSp53 in behavioral and pathological features using Alzheimer's disease mice model

Student's Name

Lee Shin Yong

Approved Digest

Alzheimer's Disease (AD) is characterized by the accumulation of amyloid-beta(Aβ), which occurs 20 years before the onset of cognitive decline and neuronal loss. Extensive research has been done regarding Aβ. However, the precise propagation mechanism of Aβ remains unknown. Recent research has focused on the role of EVs as carriers of Aβ assisting the propagation of Aβ. Our study focuses on IRSp53, a protein abundantly expressed in the brain, which has been implicated in various neurological disorders such as schizophrenia, autism spectrum disorder, and attention deficit hyperactivity disorder. Considering the role of IRSp53, we hypothesized that IRSp53 could play a role in AD. Here, we aim to investigate whether IRSp53 plays a role in AD. We crossbred mice carrying humanized APP knock-in mutations with IRSp53$^{-/-}$ mice. Behavioral tests were conducted to understand the cognitive function of loss of IRSp53 in AD mice. Then, we hypothesized the improved cognitive function upon the loss of IRSp53 was resulted from the reduced Aβ-bearing EVs that are generated from IRSp53-mediated protrusions. In conclusion, our findings suggest the potential involvement of IRSp53 in AD through cognitive function, Aβ accumulation, and neuronal number.