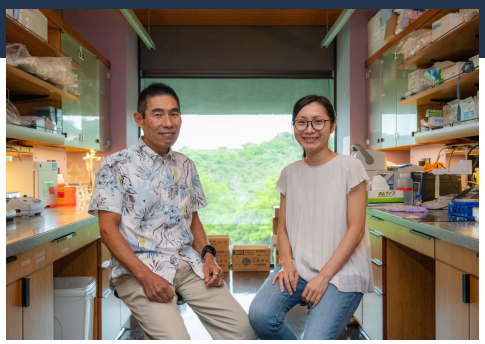
Phase I



A new small peptide, PHDP5, as a potential treatment of Alzheimer's Disease

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What is the problem?

Alzheimer's disease is a progressive neurodegenerative disorder that affects memory, cognition, and behavior, and there is currently no effective treatment. Current medications can reduce the symptoms, but there are still concerns. These concerns may be attributed to the fact that the etiology of Alzheimer's disease is not fully understood, and the blood-brain barrier (BBB) restricts drug efficacy. Moreover, over 65% of people with late-onset Alzheimer's disease are women, who also exhibit more rapid cognitive decline over time. Although the higher prevalence of AD in women may be attributed to risk factors such as sex hormones, genetics, and differing inflammatory responses, sex differences in the response to medication may exist. Therefore, it is crucial to assess drug efficacy in females.

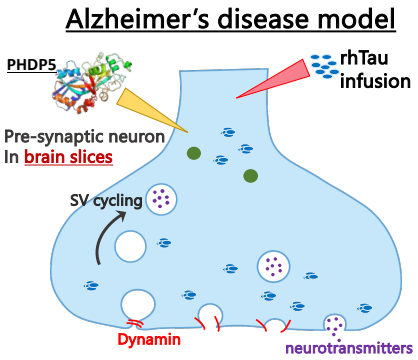

Figure 1. PHDP5 can inhibit the MT-dynamin interaction and significantly rescue endocytic impairments, suggesting its potential value for the treatment of Alzheimer's disease.

What is your solution?

We have developed a small peptide (PHDP5) that can be administered non-invasively as a potential therapeutic candidate for Alzheimer's disease (Chang et al., 2024). PHDP5 inhibits the interaction between microtubules (MT) and dynamin, which is associated with abnormal tau protein. In addition, PHDP5, with its small molecular weight (3.5 kDa), can cross the BBB, reach the hippocampus, and improve cognitive dysfunction when administered intranasally to 6-month-old male tauopathy model mice. This indicates that the PHDP5 peptide has addressed the issue that many therapeutic agents struggle to cross the BBB. Next, we will investigate potential sex-specific differences in the response to PHDP5, elucidate the correlation between PHDP5 and neurofibrillary tangles, and optimize the dosage of PHDP5 for delivery to the brain.

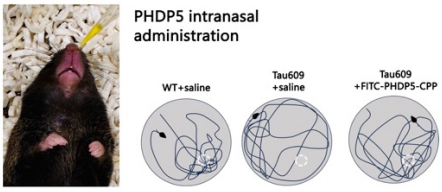

Figure 2. Intranasal administration of PHDP5 rescues learning and memory deficits in tauopathy model mice.

Other resources

- Publication

Contribution to SDGs

Keywords: PHDP5; Alzheimer's disease; BBB; Tau

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