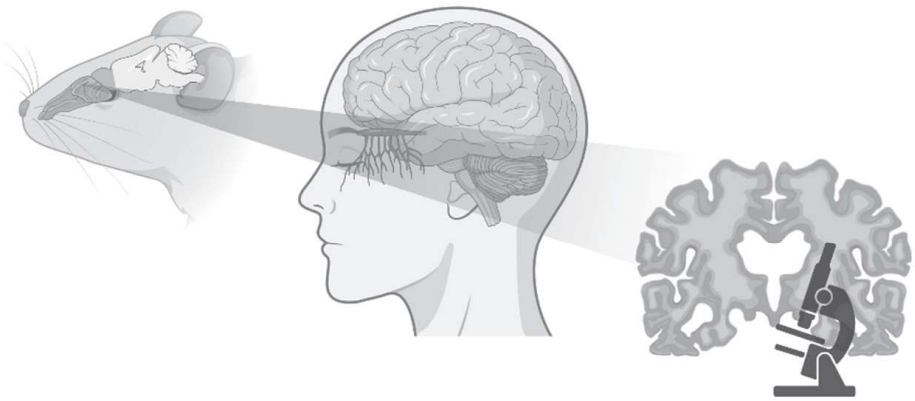
Olfactory system pathology in Alzheimer's Disease

Appendix

Valorization



Given that Alzheimer's disease (AD) is progressive and incurable, the current principal application against AD progression is an early identification for appropriate clinical intervention. Although researchers in universities, pharmaceutical industries, and medical centers have endeavored to discover effective monitoring and diagnostic method of AD, it remains incomplete.

As an early symptom of AD, olfactory dysfunction has important implications. The olfactory system has generated a great deal of interest in recent years as a novel tool for diagnosis. In specific, an olfactory test for AD has been proposed for clinical research over the last 30 years. The findings in this thesis provide scientific evidence about partial hyposmia or specific anosmia in AD and imply the significance of development measuring AD-specific olfactory dysfunction. Notably, partial hyposmia is a significant discovery because it can develop diagnostic methods that can easily monitor a mild cognitive impairment group. Even it might be applied to cognitively asymptomatic groups in AD progression. Moreover, the mechanism between the olfactory dysfunction in AD progression and the misfolded protein (e.g., amyloid-beta) accumulated in the olfactory system can lead to a new concept in AD therapeutic strategies.

Furthermore, olfactory pathology allows us to speculate that the impaired olfactory epithelium includes altered cellular and molecular components. In this regard, nasal discharge from the olfactory epithelium may feasibly contain high-throughput biological material information that mirrors AD pathological changes in the olfactory system that could be linked to the olfactory epithelium. The results of

this thesis indicated a positive correlation between the biomarkers' level in nasal discharge and AD progression. Nasal discharge biomarker would be a better option to screen for AD because of the advantages; AD-specific early detection, economic accessibility, and non-invasive sample collection. This new diagnostic resource will aid much convenient and more accessible detection of AD before the laborious and expensive diagnosis in the clinic, thus bringing much relief to millions suffering from AD.

Correspondingly, these findings about olfactory neuropathology may provide a new platform for conducting preclinical and clinical studies to improve diagnostics in AD and better understand the mechanisms behind neurodegeneration in AD.