Research Project Overview

「Early detection and modulation of the dementia pathogenesis based on the concept evolving from glial pathology to senoinflammation」

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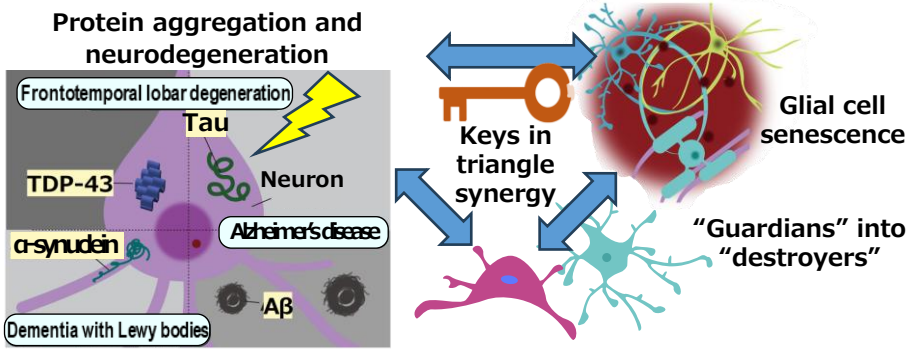
Outline of R&D Project

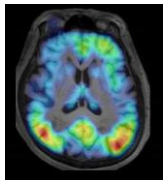
We hypothesized that the fundamental basis of dementia lies in the transformation of brain "guardians," such as glial cells, into "destroyers" through a process called "senoinflammation," which involves the interaction between inflammation and cellular senescence. This transformation leads to pathological protein aggregation and neurodegeneration. Our goal is to identify key molecules that influence this "senoinflammation" in the brain at a very early stage and to develop a next-generation dementia diagnostic workflow that allows us to monitor and control these key molecules.

Identification of key components in brain senoinflammation



Next-generation theranostic workflow targeting key molecules

Screening by ultra-sensitive, rapid, and low-cost liquid biopsy



Visualizing and controlling key components by imaging

Expected Breakthroughs by 2040

- Aiming to create a theranostics system that simultaneously diagnoses and treats senoinflammation by observing key components while treating at cellular, organismal, and human levels.
- Utilizing multi-omics analysis to explore key components hidden in brain cells and body fluids, combined with deep learning models to trace the origin of pathological substances.
- Developing a liquid biopsy that uses light pressure to detect key components rapidly and cost-effectively from tiny amounts of body fluids.