# Research Theme

Neuroscience and Mental Health/Translational Neuroscience

---

# Research Project Title

Development of Early Molecular Imaging Biomarker Probes for the Detection of Neurodegenerative Diseases

---

# Principal Investigator

Professor Balázs Gulyás

---

# Project Description

Neurodegenerative diseases (NDDs), including Alzheimer’s Disease (AD) and Parkinson’s Disease (PD), pose a major health concern worldwide, in general, and due to fast ageing population in Singapore and other countries. To understand better the disease mechanisms of NDDs would lead to the identification of disease biomarkers, the development of biomarker probes, and to novel therapeutic approaches. The early disease mechanism would help us alleviate the disease burden caused by NDDs, improve the quality of life of millions of patients and their families as well as reduce health care-related costs.

Till date there is no successful treatment developed to cure NDD’s. The failure is mainly associated with the fact that the available diagnostic methods are based on “late biomarking approaches” and, consequently, reveal the disorders at very late stages. The development of diagnostic approaches which would predict the development of the diseases prior to disease onset or which could be used to indicate the on-set of the disease early on and monitor the early disease progression are critically important for tackling the conundrum.

This research topic focuses on the identification of early disease biomarkers in NDDs and, based on these observations, the development of “early molecular imaging probes” as prospective diagnostic agents for NDD. The approaches will include the identification of disease biomarkers based on early glial pathologies, accumulation of misfolded proteins, autophagy-related processes and other mechanisms. Based on these approaches, we plan to develop biomarker probes for both central (brain) and proxy (periphery: blood, urine, saliva, skin, etc.) marking.

---

# Contact Us

If you have questions regarding this project, please email the Principal Investigator.

Professor Balázs Gulyás
Professor of Translational Neurosciences | Scientific Director, Neuroscience and Mental Health
Lee Kong Chian School of Medicine, Nanyang Technological University Singapore
Email: balazs.gulyas@ntu.edu.sg