

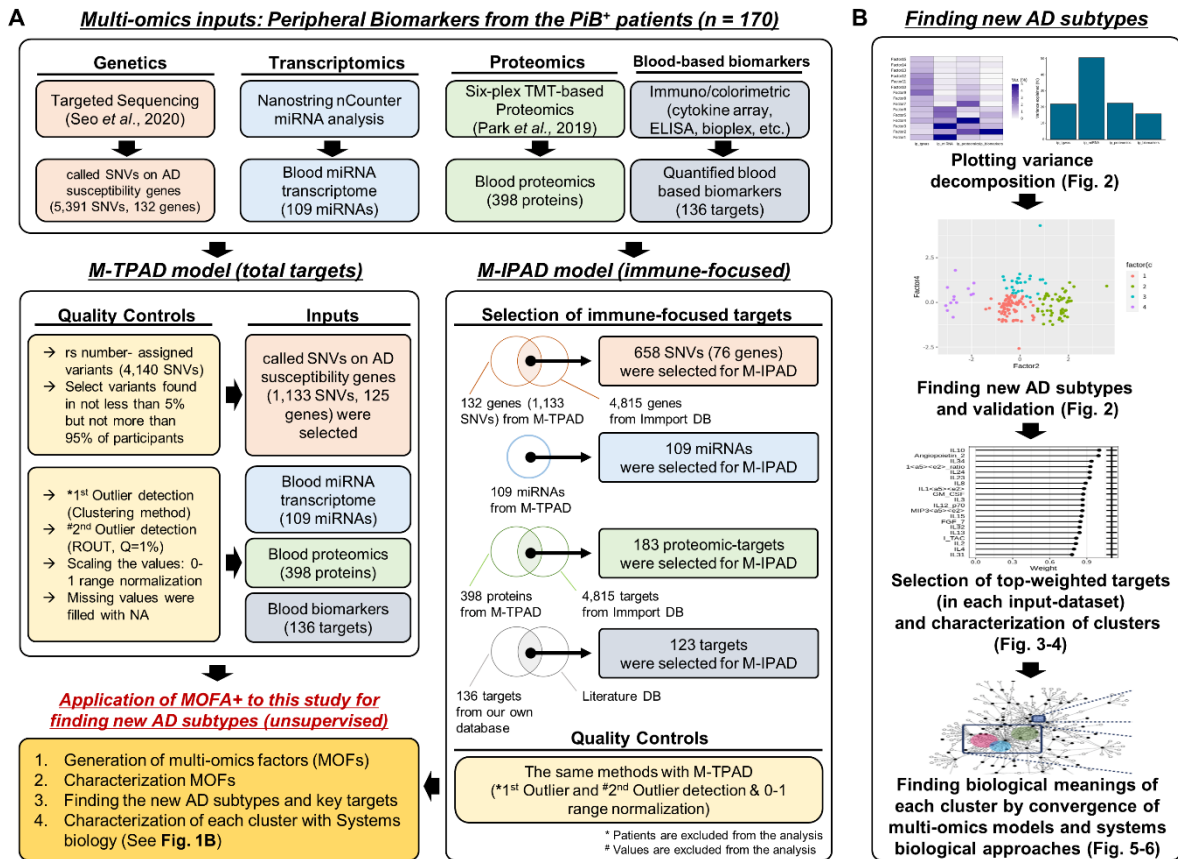
Multi-omics-based autophagy-related untypical subtypes in Alzheimer's disease

Jong-Chan Park, Ph.D. (Seoul National University Medical Research Center)

Detailed Affiliations: Neuroscience Research Institute, Medical Research Center, College of Medicine, Seoul National University, Seoul, 03080, Republic of Korea; SNU Korea Dementia Research Center, College of Medicine, Seoul National University, Seoul, 03080, Republic of Korea; Department of Neurodegenerative Disease, UCL Queen Square Institute of Neurology, University College London, London, WC1N 3BG, UK

Abstract:

Recent multi-omics analyses paved the way for a comprehensive understanding of pathological processes. However, only few studies have explored Alzheimer's disease (AD) despite the possibility of biological subtypes within these patients. For this study, unsupervised classification of four datasets (genetics, miRNA transcriptomics, proteomics, and blood-based biomarkers) using Multi-Omics Factor Analysis+ (MOFA+), along with systems-biological approaches following various downstream analyses were performed. New subgroups within 170 patients with cerebral amyloid pathology were revealed and the features of these subgroups were identified based on the top-rated targets constructing multi-omics factors of both whole (M-TPAD) and immune-focused models (M-IPAD). Further in-depth studies showed that these AD subtypes are associated with longitudinal brain changes and revealed that autophagy-related pathways mainly contribute to the AD subtype clustering. Hence, this study provides a strategy for precision medicine therapy and drug development for AD using integrative multi-omics analysis and network modelling.



[Experimental design of this study]