lipolysis, IR, and adiponectin/leptin secretion. Haplotyping, epistatic and bioinformatic analyses will be engaged to capture additional/functional variants and regulatory networks.

GENES INVOLVED IN PHYSIOLOGICAL DYSREGULATION AND DECLINE IN RESILIENCE: ROLE IN ALZHEIMER'S DISEASE
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Our recent GWAS of a composite measure of physiological dysregulation (PD) in the Long Life Family Study (LLFS) found that the top genes associated with age-related changes in PD are involved in biological pathways relevant to maintaining neural networks and brain resilience. In our prior work, PD itself was linked to resilience-related traits. Alzheimer’s disease (AD) is a heterogeneous trait and it may involve an accelerated decline in resilience with age as a contributing factor. We proposed that genes associated with aging-changes in PD and brain resilience may contribute to AD risk. We investigated interactions between SNPs in such candidate genes with AD in LLFS and Health and Retirement Study (HRS). Our analysis revealed significant interactions between SNPs in such candidate genes with AD in LLFS and other genes with AD, in both LLFS and HRS. These findings support roles of genetic interactions with UNC5C gene (implemented in axon growth and neuronal apoptosis) in AD.

METABOLIC PROFILE DIFFERENCES BETWEEN DEMENTED AND NON-DEMENTED APOE4 CARRIERS IN THE LONG LIFE FAMILY STUDY
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The apolipoprotein e4 (APOE4) is the most prevalent genetic risk factor for late-onset Alzheimer’s Disease (AD). Here we assessed the metabolomic profile differences between APOE4 carriers who develop AD vs. who do not in a sample of 142 participants, aged 65-99 years in the Long Life Family Study (LLFS). Of 7,321 metabolites, we applied a generalized estimating equation model and identified 137 metabolites significantly associated with AD. Subsequent multivariate analyses were performed for prediction and clustering recognition. Among annotated metabolites, 8 metabolites in the eicosanoids and docosanoids group, 3 metabolites in the fatty acids group, and arabitol were associated with elevated risks of AD (OR: 1.6-2.3). On the other hand, a different set of metabolites were associated with reduced risks of AD (OR: 0.34-0.64). These metabolomic profile differences can be used to help with early diagnosis in the population of older APOE4 carriers in the pre-clinical stage.

DISCOVERING MODALITY OF COGNITIVE FUNCTION USING CLUSTERING ANALYSIS
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In this study with Long Life Family Study (LLFS) participants, we aimed to identify patterns of performance on cognitive function assessments as specific cognitive signatures. We hypothesize that such signatures can be correlated with biomarkers and clinical outcomes. More than 4,700 LLFS participants were administered, at enrollment, a series of neuropsychological tests that measure various cognitive domains. We performed a cluster analysis to group LLFS subjects into clusters characterized by combinations of six neuropsychological test scores. The analysis resulted in 10 clusters of varying size with different cognitive signatures that (1) significantly correlated with physical and pulmonary function, and 31 blood biomarkers and (2) predicted mortality and incident medical events such as dementia, cardiovascular diseases, etc. We conclude that cluster analysis of multiple neuropsychological tests discovers cognitive signatures that are more specific than individual cognitive domains and that these can be correlated with blood biomarkers, incident medical outcomes and mortality.

SESSION 4590 (Paper)
OLDER ADULTS AND HOSPITALIZATION
EMERGENCY DEPARTMENT ADMISSIONS AMONG OLDER ADULTS LIVING ALONE WITH MULTIMORBIDITY

Older adults living alone are at higher risk of mortality, morbidity and healthcare utilization. As more older adults live alone, Emergency Department (ED) admissions could rapidly increase, particularly among those with multimorbidity. We studied the association of living alone on ED admissions among older adults with multimorbidity. We used data from 16,785 older adults of the population-based Singapore Chinese Health Study (mean age: 73 years, range: 61-96 years) who were interviewed in 2014-2016 for living arrangements and medical history. Participants were followed-up for one year on ED admission outcomes (number of admissions, inpatient days and hospitalization