Predicting healthy ageing and neurodegenerative disease using diagnostic biomarkers of the gut microbiome

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Different bacteria in the gut have been linked with longevity and healthy ageing. However, some of these bacteria can cause activation of the body's immune system, which has the potential to cause harm. Research has shown that activation of the immune system is linked with developing Alzheimer's disease and Parkinson's disease later in life. Alongside our commercial partner, TopMD, we aim to compare gut microbiome and host gene expression between people with neurodegenerative disease and matched controls. We hypothesise that specific microbiome and host gene expression signatures are associated with healthy ageing and neurodegenerative disease. We have designed a cross sectional, observation study involving participants with Alzheimer's Disease (n=75), Parkinson's Disease (n=75), Dementia with Lewy Bodies (n=15) and matched controls (n=50). Potential participants will be screened from local research databases, join dementia research online recruitment platform and referrals from local physicians. We will collect demographic and clinical information, perform physical and cognitive testing, and take samples of blood, skin, saliva, and stool. Recruitment will end in May 2022. We hope that our results will allow us to develop the first ever combined test of gut bacteria and genes that will be used to help diagnose neurodegenerative diseases.