

00248 **A Novel Non-invasive Biomarker to Detect Early Alzheimer's Dementia and Parkinson's Disease**

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Aims: Alzheimer's Dementia (AD) and Parkinson's Disease (PD) are two of the most common and highly debilitating neurodegenerative conditions afflicting millions of patients worldwide. To date, no reliable non-invasive diagnostic assay exists for either of these conditions that affect more than 25% of Singapore's ageing population. Doctors often rely on clinical judgment to start therapy, resulting in possible late diagnoses in many patients thereby adversely affecting their quality of life. In this proposal, we aim to pioneer the use of oral mucosal swabs to reliably detect not just AD but PD as well in the Singaporean population.

Methodology: We hypothesize that ectodermally derived oral mucosal cells contain differing levels and microarchitectural distributions of AD and PD-related proteins such as Beta-Amyloid and Alpha-Synuclein. Using immunological staining techniques available at the Singhealth Advanced Bioimaging Core Facility, we endeavour to perform detailed immunofluorescence microscopy of oral mucosal cells from patients and compare them from healthy age-matched controls.

Result: Our preliminary data shows that the nuclear and cytoplasmic distribution of pathogenic proteins such as Beta-amyloid and Alpha-synuclein in AD and PD respectively change dramatically in disease states. These molecular changes can be quantified using an immunofluorescence platform and certain disease signatures can be obtained in order to improve the sensitivity and specificity of this novel diagnostic assay which can potentially detect changes early in the course of the disease.

Conclusion: In summary, this proposal represents a pilot study aimed at developing a novel non-invasive oral-based diagnostic assay which may augment clinical diagnosis of AD and PD.