DECODING DEMENTIA THROUGH SALIVA: A NON-INVASIVE PATH TO EARLY DIAGNOSIS - SALVIA

PROTECTION

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Owners: Galician Public Foundation for Biomedical Research Galicia Sur (FPGIBGS); Servizo Galego de Saúde (SERGAS).

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BACKGROUND

Alzheimer's disease (AD) and related cognitive disorders remain substantially underdiagnosed, particularly at preclinical and prodromal stages when disease-modifying interventions would be most effective. Current diagnostic pathways rely primarily on cerebrospinal fluid (CSF) biomarkers (Aβ42, pTau, tTau) and neuroimaging (PET or MRI). While biologically informative, these approaches are invasive, costly, infrastructure-dependent, and unsuitable for repeated monitoring or large-scale population screening. As a result, diagnosis is often delayed until significant neurodegeneration has already occurred.

Blood-based biomarkers have improved accessibility, but still require venipuncture, laboratory infrastructure, and cold-chain logistics, limiting scalability in primary care and community settings.

Moreover, most existing tools are designed for confirmation of suspected dementia rather than early stratification of at-risk individuals. There remains a critical gap for a rapid, non-invasive, low-cost, and deployable screening technology capable of identifying early cognitive impairment and enabling longitudinal monitoring.

Surface-enhanced Raman Spectroscopy (SERS) is currently a powerful analytical technique for the development of rapid and easy-to-use diagnostic tests, applicable in biological fluids and with great potential for sample screening and use in biomarkers of therapeutic efficacy.

ACHIEVEMENT AND RESULTS

It is proposed a multiplex, bead-based SERS biosensor for rapid, non-invasive saliva detection of cognitive impairment. It will measure **SALVIA** proteins (a saliva-based biomarker developed and protected by our group), using antibodies functionalized with a Raman "antenna" on SiO_2@Ag beads. Protein binding changes the Raman signal, enabling sensitive, ratiometric quantification in minutes. The asset will offer portable, scalable, and objective early diagnosis and patient stratification.

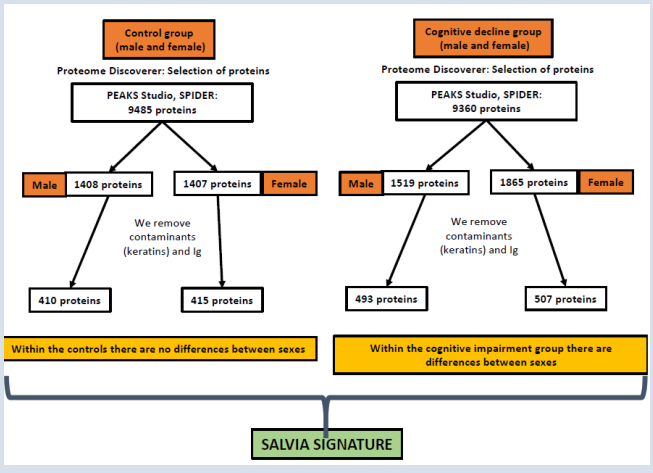
PURPOSES AND ADVANTAGES

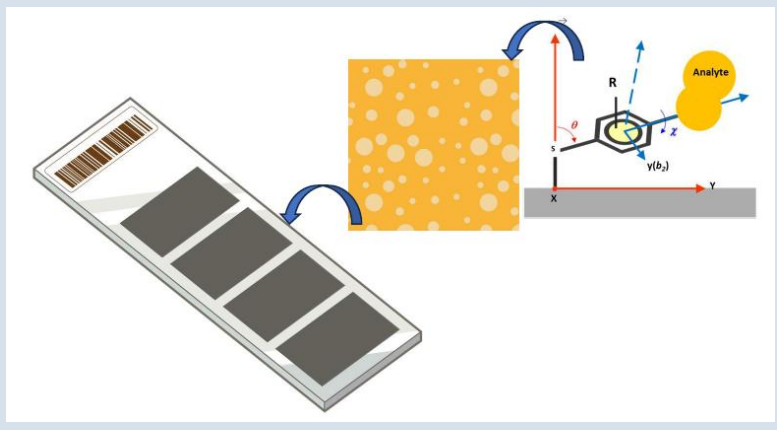
The **main advantages** of this propose are:

- A new salivary biomarker panel has been identified and validated.
- This biomarker panel is based on three key proteins, called **SALVIA signature**, whose levels reflect brain health.
- An accurate system that allows the detection of protein fragments at very low concentrations, avoiding the problem of the conventional methods, especially in the early stage of the disease has been validated.

COLLABORATION OFFER

This offer can be materialized in a "Partnership Agreement" in order to co-develop this technology or in a "License Agreement" for using use the proposed technology directly. If this offer is of your interest or you need more information about, please contact us.





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