Protein-Misfolding as fluid biomarker in Morbus Alzheimer and Parkinson measured by the iRS (immuno-Infrared Sensor)

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Blood-based biomarkers will allow, in contrast to the current expensive PET scan and invasive CSF diagnostics, an early and non-invasive broader access to the Alzheimer´s (AD) diagnosis. We have invented Aβ misfolding as blood-based biomarker [1,2].
With the innovative immuno-Infrared Sensor (iRS), we measure the secondary structure distribution of all Aβ isoforms in body fluids as a misfolding biomarker [3]. The new iRS platform technology uses quantum cascade lasers as light source, ATR crystals to measure aqueous fluids in thin films and surface-bound antibodies to concentrate the biomarkers in the evanescent wave. A blocking layer prevents unspecific binding on the sensor surface. The iRS overcomes the challenges of traditional infrared spectroscopy and allows measurements of specific targets in aqueous solutions with the sensitivity and specificity of the capture molecule bound to the sensor surface.
We have shown in clinical studies that the misfolding biomarker indicates probable AD in a prospective cohort [2]. We extended this to earlier mild cognitive impaired [3]. We also investigated the performance of Aβ misfolding as a prescreening plasma biomarker for the development of AD in a symptom-free, population-based cohort up to 17 years before clinical diagnosis [4].
Recently, we extended this approach to Parkinson´s disease (PD) using alpha-synuclein misfolding as biomarker [5]. In unpublished work, this is also extended to blood serum.
The misfolding biomarker might become a preventive blood screening test for the elder population to determine the risk of future clinical AD and PD. These early diagnosis and intervention of Alzheimer's by the new FDA-approved drugs might provide much better therapy response.

References:

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