EARLY DIAGNOSIS OF ALZHEIMER'S DISEASE BY MONITORING AGGREGATED AMYLOID-β PEPTIDE?

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Introduction: Still, Alzheimer’s disease (AD) can be diagnosed with certainty only post mortem based on the presence of insoluble amyloid-β peptide (Aβ) aggregates and neurofibrillary tangles in the patient’s brain tissue. Thus, biomarkers for early diagnosis of AD are urgently needed.

Aim: Our objective is to validate Aβ oligomers and aggregates in body fluids as potential biomarkers. An important goal will be the investigation of any correlation of Aβ aggregate number, size and composition in body fluids like blood and CSF with clinical disease progression.

Methods: We have developed an ultra-sensitive assay system for the detection and investigation of Aβ aggregates and oligomers in body fluids, called surface-FIDA [1-3]. The aggregates are immobilized on a glass surface, labelled by specific fluorescent probes, and detected using laser scanning spectroscopy (LSM) [4].

Results: We show that oligomer detection and quantitation can be performed using a LSM setup and is even suitable for detailed characterization of Aβ aggregates. Additionally, we could implement super-resolution microscopy methods for a more detailed Aβ oligomer detection.

Conclusion: Here we describe that surface-FIDA is sensitive and specific enough to count Aβ oligomers, possibly to be used as a minimally invasive tool for early diagnosis of AD, on-line monitoring of disease progression, and monitoring of therapeutic approaches.