NOVEL BIOMARKERS CHARACTERIZING NEURODEGENERATION AND NEUROINFLAMMATION IN ALZHEIMER’S DISEASE (AD)

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Current treatment in AD is initiated at a stage where the brain has lost already many neurons which cannot be rescued anymore and neuroinflammation takes place. Hence, the concept, to treat neurodegeneration prior obvious cognitive deficits becomes more and more accepted.

Since simple biochemical tests to discriminate normal aging from prodromal or demented stages are needed, we focus on diagnosis of AD analyzing potential plasma biomarkers reflecting both, neurodegeneration and neuroinflammation. We here present a novel ELISA for reliable determination of Aβ(1-40/42) in biological fluids as well as a novel antibody detecting the biologically active form of an inflammatory biomarker.

In contrast to Aβ analysis in CSF, attempts to determine Aβ in plasma are neither reliable nor clear. Usually, ELISA-type analytical systems are applied for quantification. Critical parameters, such as recovery and linearity are not analyzed nor are they mentioned in appropriate publications. This might be a reason for even contradictory results in some studies.

We optimized a new method for isolation and quantification of plasma Aβ, which was validated for maximal recovery and linearity. We found a significant increase of Aβ(1-40) in plasma of AD/MCI patients allowing a clear discrimination between controls and effected individuals.

We also developed a plasma-based assay detecting only the biologically active form of a cytokine triggering neuroinflammation. The assay was validated for human, mouse and rat body fluids and is currently applied to monitor drug activity in cell culture and animal models including diagnostic analysis of human CSF and plasma.