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Alzheimer's and Parkinson's diseases (AD and PD) are the two most common neurodegenerative conditions. In Europe, more than 10 million individuals have AD or PD. These diseases are devastating for the patients, but also cause major costs for the society. With the help of biomarkers, indicating specific brain changes in AD and PD, we can now detect biochemical changes 10-20 years before any symptoms. In order to do something substantial about these diseases, we need to diagnose early, before too many neurons have been lost, and find treatment that halt the destructive process. Current treatment only gives symptomatic relief. However, many clinical trials on disease modifying drugs are ongoing and near conclusion.

The main molecular findings in AD are amyloid plaques and neurofibrillary tangles. The amyloid plaques are located around the nerve cells obstructing the signal transmission between the cells, and the neurofibrillary tangles are located within the cell. Both phenomenon causes increased cell death, leading to the memory and cognitive problems we see in AD.

The main molecular findings in PD are presynaptic aggregates of α-synuclein (aSyn) and loss of dopaminergic neurons. Clinically the disease is characterized by motor and non-motor symptoms, but the diagnosis is usually made too late, when more than 50% of the dopaminergic neurons are already degenerated. Currently, there is no objective outcome measure for clinical trials in PD.

The goal for this project was to standardize the sampling and measurement for the already known biomarkers, as well as to develop new ones for AD and PD. This has been done by developing and validating protocols for these processes and to give training courses for the staff, why now most of the centres in Europe are performing this procedure in a common, standardized way. We have developed protocols for analysis of CSF Aβ, P- and T-Tau (AD markers) and aSyn (PD marker) both for clinical practice and for clinical trials. We have also identified Neurogranin as a new CSF marker on the function in nerve synapses in AD and DJ-1 in CSF as a new biomarker for PD.

This project has resulted in 135 publications in international journals. The work will continue in a European "CSF Society" established by the members of BIOMARKAPD. This society also aims to include new members from European centres in order to reach standardization all over Europe.