Development of a late-onset-Alzheimer’s disease (LOAD) profile for accurate diagnosis and identification of potential therapeutic approaches

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Name of Fellow
Institution
Funder

European Commission FP7-Seventh Framework Programme

Contact information of fellow
Country

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Development of a late-onset-Alzheimer’s disease (LOAD) profile for accurate diagnosis and identification of potential therapeutic approaches

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The project/programme is most relevant to:

Alzheimer's disease & other dementias

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Metabolomics | Protein-Chip | DNA-Chip | Platelets | Plasma | Erythrocytes | One carbon cycle

Research Abstract
Late-onset Alzheimer’s disease (LOAD) is a neurodegenerative disorder that currently affects 2% of the population in industrialized countries; the risk of LOAD increases in individuals beyond the age of 70 and it is predicted that the incidence of LOAD will increase 4-fold within the next 50 years which may cause a great socioeconomic problem. Early diagnosis and evidence-based interventions that improve the condition of LOAD patients are not available. Numerous studies revealed that LOAD is an age-related multifactorial disease, which is evident on the protein level in hardly accessible cerebrospinal fluid by decreased beta amyloid and increased hyperphosphorylated tau protein.
The Medical University of Vienna and the diagnostics company Randox have already characterised LOAD related proteins in blood platelets that reflect features of neurons. These proteins indicate multifactorial interactions in LOAD leading to our holistic approach. The present project, unlike others, will simultaneously determine (epi)genetic, protein-specific, and metabolic parameters of LOAD patients.
On the genetic level LOAD is associated with Apolipoprotein E4 polymorphism. Decreased vitamin B12 and folate and increased homocysteine levels are metabolic dysfunctions that may be linked to epigenetic changes in methylation patterns of LOAD relevant genes.
The University of Vienna will identify metabolic LOAD markers in blood. The MUW will perform complementary (epi)genetic and proteomic studies, and will generate algorithms for multi-arrays. Significant (epi)genetic aberrations in LOAD will be translated into assays of a DNA Chip at Randox. In addition, the SME Ledo and the Polish University Politechnika Lodzka join their expertise to develop a standardised ready-to-use platelet isolation column for platelet purification.
Only this intensive transfer of knowledge will achieve combined analysis of these different types of LOAD biomarkers which should allow accurate diagnosis and offer approaches to targeted therapy.

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