Universidad de Navarra

Máster en Investigación Biomédica
Facultad de Ciencias

Research Project Proposal

Project Nº 52

Title: ¨New therapeutic strategies for Alzheimer´s disease based on enhancing synaptic plasticity ¨

Department/ Laboratory *Neurobiology of Alzheimer´s disease Lab.2.01 CIMA*

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Summary

Alzheimer´s disease (AD) which is the most common form of dementia in the elderly is pathologically characterized by the presence in the brain of extracellular plaques comprised of aggregated amylod-β peptide and intracellular neurofibrillary tangles that mainly contain the hyperphosphorylated tau protein. These hallmarks provoke a neuronal dysfunction that ultimately leads to the neuronal loss observed in the atrophic brain of AD patients.

Currently, there no effective treatments for AD and the AD-drug development which mainly driven by the amyloid hypothesis, is not working properly. Most of the molecules are designed to target Aß, but unfortunately, the results of several of these drugs, that even remove senile plaques, failed in reverting or stopping the dementia. Thus, it is emerging the idea that other pathways not directly linked to Aß should be explored.

Taking into account this idea, our group is focused on finding new therapeutic targets for AD. We study the molecular changes associated to adaptive synaptic plasticity processes that occur in situations of continued administration of drugs such as histone deacetylase inhibitors, phosphodiesterase inhibitors or growth factors, in particular, those related to learning and memory phenomena.

Accordingly, using Alzheimer´s disease mouse models, different therapeutic approaches are planned to be tested in the lab. To test memory function, several behavioural paradigms

(object recognition, fear conditioning or the Morris water maze test) will be used and to analyze the pathological signs of the AD brains, different biochemical techniques such as real time PCR, western-blot or immunohistochemistry will be used.
POSSIBILITY OF PhD YES* * (PhD grant required)