THE NEURAL BASIS OF COGNITIVE DEFICITS IN A MOUSE MODEL OF ALZHEIMER'S DISEASE

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Introduction: Among the features of Alzheimer's Disease (AD) pathology is damage to the dendrites and the synaptic connections as well as loss of neurons. These processes have been strongly linked to the cognitive impairment seen in AD. Since the hippocampus is known to be involved in the processes of learning and memory, a morphometric investigation of the hippocampus is undertaken, with emphasis on neurogenesis, neuron number and synaptic number.

Aims:

1) Behavioural characterization of a mouse model of AD.

2) Investigation into the neural basis of the cognitive dysfunctions observed in said model.

Methods:

1) Animal model: This study is based on the use of double transgenic (APPxPS1) mice developing AD-like pathology from 6-9 months of age.

2) Behavioural testing: Behavioural tests, such as Open Field, Elevated Plus Maze, Social Interaction, Social Memory and Y Maze, are performed to assess general activity, anxiety, emotional level and cognition.

3) Histochemical studies of the hippocampus:
   a. Neurogenesis in the granule cell layer, GCL.
   b. Total neuron number and volume of the Dentate Gyrus (DG), Hilus and CA-regions.

Results:

1) Behaviour: Significantly reduced exploratory behaviour and 'drive', and significantly poorer working memory.

2) Histochemistry: Reduced neurogenesis in the GCL, total neuron number of the DG, hilus and CA-regions currently being assessed.

Conclusion: 18 months old APPxPS1 mice have severe cognitive deficits as well as reduced neurogenesis in the DG, and is expected to have reduced volume as well as total neuron number of DG, hilus and CA-regions compared to WT mice.