THE EFFECT OF A CHOLESTEROL ENHANCED DIET ON SPATIAL MEMORY AND LEARNING IN APOE4 AND APOE KO MICE

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Introduction: Alzheimer's disease (AD) is a progressive neurodegenerative disorder. Results from trials and epidemiological studies suggest that cholesterol may affect the degeneration in AD by interference with the cerebral circulation. Apolipoprotein E (ApoE) protects against high-fat diet-induced neurodegeneration. However, one of the isoforms of ApoE, E4, has been identified as a risk factor for both late-onset AD and hypercholesterolemia. In the current study we investigated the influence of a cholesterol enhanced diet on both behavioural and neuropathological changes in wild-type, ApoE4, and ApoE-knockout (ApoE-ko) mice.

Aim: To assess how a cholesterol enhanced diet may contribute to the progression of AD-like cognitive and neuropathological changes and the modulatory role of ApoE in this process.

Methods: At 12 months of age female wild-type, ApoE4, and ApoE-ko mice were fed either a standard diet (control) or a cholesterol enhanced diet (1% cholesterol). At 15 months of age mice underwent cognitive tests. The novel object recognition task (ORT) and Morris water maze (MWM) were used to examine spatial memory and learning functions. In addition, biochemical and immunohistochemical analyses were performed to unravel the underlying mechanisms.

Results: Our results are currently being processed and will be presented.

Conclusions: The cholesterol enhanced diet is expected to lead to impairments in memory and learning functions. We hypothesize that biochemical and immunohistochemical analysis will show neuropathological changes supportive of neurodegeneration.