

Science expanded behind DHA's Alzheimer's protection

By Stephen Daniells

18/04/2007 - **A pre-clinical study shows that the omega-3 fatty acid DHA may cut the build-up of a certain protein linked to Alzheimer's, said to be the first such study to show report such results.**

The research, published in the *Journal of Neuroscience*, significantly expands the growing body of science linking intake of the omega-3 fatty acids, mainly docosahexaenoic acid (DHA), to improved cognitive function and slower cognitive decline.

"We are greatly excited by these results, which show us that simple changes in diet can positively alter the way the brain works and lead to protection from [Alzheimer's](#) disease pathology," said researchers from the University of California Irvine.

Currently, about 12 million people in the US plus the EU suffer from Alzheimer's, with some estimates predicting this figure will have tripled by 2050. The direct and indirect cost of Alzheimer care is over \$100 bn (€ 81 bn) in the US alone. The direct cost of Alzheimer care in the UK was estimated at £15 bn (€ 22 bn).

This study used genetically modified mice, and is reported to be the first study to show that [DHA](#) may slow the accumulation of a protein, tau, that leads to the development of neurofibrillary tangles, one of two signature brain injuries of Alzheimer's disease.

The work of researchers also confirmed previous studies that increased levels of another protein, beta amyloid, clump in the brain to form plaques which are the other form of lesion associated with Alzheimer's, and that DHA could reduce levels of beta amyloid.

The study mice were genetically engineered to develop these beta amyloid plaques and the tau-dependent tangles. The mice were divided into four groups and one group fed a control diet similar in constitution to the typical American diet, with the ratio of omega-6 fatty acids to omega-3 fatty acids being 10:1. The other three groups were given chow with a balanced 1:1 ratio of omega-6 fatty acids to omega-3 fatty acids, and additionally supplemented with DHA only (one group) or DHA plus long chain omega-6 fatty acids (two groups).

After three months of feeding, all the DHA supplemented groups were found to have lower beta amyloid and tau levels than the mice fed the typical American diet, but after nine months only mice supplemented with DHA only had lower levels of both proteins. This effect was not seen in the other two test groups.

A mechanistic study revealed that supplementation with DHA led to lower levels of presenilin, an enzyme responsible for cutting beta amyloid from its parent, the amyloid precursor protein. Therefore, without presenilin, beta amyloid cannot be produced.

"The results of the research provide a potential mechanism of action for the beneficial role that DHA may have in delaying onset of the disease," said researchers. *"We look forward to the results of additional research that will further evaluate the importance of DHA for cognitive function."*