



Effects of omega-3 oil, on calmodulin kinase II gene expression in the hippocampus of rat during memory formation

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Background and Aims: Multiple unsaturated fatty acids (PUFA) are essential factors to neuronal cell membrane fluidity and memory formation. Present study was designed to survey the effect of omega-3 on the of Calmodulin kinase II gene expression as one of the key genes in the synaptic currents in the hippocampus of rats during memory formation. The hippocampus is a major component of the brains of humans and other vertebrates and plays important roles in the consolidation of information from short-term memory to long-term memory and spatial navigation.

Methods: Male wistar rats weighing (200-220g) were used in this project. Rats were treated for one month with 400 mg/kg dose of omega-3. After a specified time period rats were sacrificed and the hippocampus was extracted to verify the desired Calmodulin kinase II gene expression by Real-time PCR.

Results: RNA extraction and cDNA synthesis of the samples was performed. Real-time PCR were performed to evaluate gene expression and memory formation, in the group that treated with omega-3. Our data showed that, Omega-3 was an effective factor in strengthening synaptic currents and gene expression

Conclusions: Omega-3 as an energy source has an effective role in the neuronal cell membrane structure. Multiple unsaturated fatty acids (PUFA) increase maintain continuity neuronal membrane structure fluidity synaptic currents to be transmitted. Membrane fluidity is an essential factor in memory and learning.

Keywords: Omega-3, Learning and memory, Clmodulin kinase II