Roles and Mechanisms of Docosahexaenoic Acid (DHA) in Neurodevelopment, Neuronal Functions, Learning and Memory

Abstract

Docosahexaenoic acid (DHA) is an omega-3 fatty acid which is a major constituent of the brain, retina and skin in terms of structure. DHA can be produced from the metabolic synthesis of alpha linolenic acid (ALA) or gotten from breast milk, fatty fishes, or oil from algae. Studies have shown that DHA is an essential nutrient for normal functioning of the brain. It is the major omega-3 fatty acid present in brain tissues and is known to have effects on neurotransmitters, synaptic transmission, and signal transduction. Also, certain DHA metabolites are biologically active molecules that protect the tissues from oxidative injury and stress. DHA is also known to carry out important membrane neuronal functions such as Phospholipid synthesis, membrane fluidity, neuronal survival, regulation of gene expression and modulation of enzyme activity in the brain. Therefore, DHA needs to be taken at developmental stages of human life such as period of pregnancy, lactation and even childhood for proper development and functioning of the brain.