

## **NEUROPROTECTIVE EFFECTS OF THE NOVEL MARINE CAROTENOID FUcoxANTHIN IN HUMAN NEURONAL SH-SY5Y CELLS**

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Fucoxanthin is one of the most abundant marine carotenoids found in edible brown seaweeds and it is considered as a major active compound of marine algae with anti-oxidant, anti-obesity, anti-inflammatory and anti-cancer activities. Recent studies show that fucoxanthin can attenuate scopolamine-induced cognitive impairments and increase the brain-derived neurotrophic factor expression in mice. A more recent study also demonstrates the ability of fucoxanthin to counteract the neuro-inflammation induced by lipopolysaccharide in BV-2 microglial cells. However, the neuroprotective properties of fucoxanthin are still unclear. In this study, we found that fucoxanthin exerts both direct and indirect antioxidant effects against reactive oxygen species formation induced by tert-butyl hydroperoxide in human neuronal SH-SY5Y cells. In particular, we recorded that fucoxanthin enhances the levels of total glutathione in SH-SY5Y cells suggesting its ability to active the nuclear translocation and phosphorylation of nuclear factor-erythroid 2-related. Furthermore, fucoxanthin showed the ability to counteract the early neurotoxic event elicited by amyloid-beta oligomers, a specific neurotoxin for Alzheimer's disease (AD), in terms of mitochondrial dysfunction with vacuole formation and enhancement of formazan exocytosis. These preliminary results encourage further researches in several in vitro and in vivo models of neurodegeneration elicited by amyloid-beta oligomers to define the potential neuroprotective profile in AD. Supported by MIUR-PRIN project 2015SKN9YT-003 (2015)

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