

Marine carotenoid reduces oxidative stress due to HO-1 expression through Nrf2-ARE signaling

Junsei Taira

Okinawa National College of Technology, Department of Bioresource Technology

Nuclear factor erythroid 2-related factor 2 (Nrf2) binds to antioxidant response element (ARE) induce antioxidant and phase II detoxification enzymes, such as heme oxygenase-1 (HO-1) and glutathione s-transferase under oxidative stress due to chemicals and exposed to UV-irradiation. Fucoxanthin (FX) and its gastrointestinal metabolite fucoxanthinol (FXOH) are marine carotenoid from edible brown algae, such as *Undaria pinnatifida*, *Hijikia fusiformis* and *Sargassum fulvellum*. In this study, the activation of compounds on Nrf2-ARE signaling in RAW 264.7 macrophage cells was examined using reporter assay. The compounds induced in low concentrations (2.5 – 10 μ M) and the western blot analysis showed to Nrf2 transfer into nuclear, resulted in expression of HO-1 protein due to binding to ARE. Interestingly, apoptotic cells with caspase 3/7 activity in the presence of the compounds also activated the Nrf2-ARE signaling with HO-1 protein expression, which indicated anti-apoptotic activity for cell survival. In addition, the activity of FXOH was higher than that of FX as well as antioxidant action and anti-inflammatory effects will be bioavailable compound in a biological system.