

Abstracts (Oral Presentation)

Fucoxanthin Attenuates Hydrogen Peroxide-induced Oxidative Stress in Placenta-derived Mesenchymal Stem Cells through Antioxidant Activity

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Abstract

Introduction: Osteoporosis is a bone disease that results in a loss of bone mass. Oxidative stress promotes osteoblast apoptosis which leads to decrease bone formation. Fucoxanthin, a carotenoid extracted from brown seaweeds, has antioxidant activity through an increased antioxidant enzyme expression.

Objectives: This study attempts to explore the cytoprotective effect and antioxidant activity of fucoxanthin to promote the cell viability of placenta-derived mesenchymal stem cells (PL-MSCs) under oxidative stress conditions.

Methods: PL-MSCs were obtained from a pregnant woman after normal delivery. Following the characterization, PL-MSCs were treated with fucoxanthin (1-5 μM) and 750 μM H_2O_2 for 24 h or cultured in both fucoxanthin (1-5 μM) and H_2O_2 for 24 h. The cell viability, intracellular reactive oxygen species (ROS) production, superoxide dismutase (SOD) activity and glutathione (GSH) were determined following treatment.

Results: The results showed that treatment and pretreatment with fucoxanthin increased cell viability, SOD activity, GSH levels of PL-MSCs when compare to control which cultured in 750 μM H_2O_2 without fucoxanthin for 24 h. While, treatment and pretreatment with fucoxanthin decreased intracellular ROS production of PL-MSCs when compare to control which cultured in 750 μM H_2O_2 without fucoxanthin for 24 hours.

Conclusions: This study demonstrated that the treatment and pretreatment with fucoxanthin increased the viability and increased antioxidant activity of PL-MSCs when compared with the control which cultured in 750 μM H_2O_2 without fucoxanthin. In addition, the treatment with fucoxanthin decreased intracellular ROS production compared with the control. This study established that fucoxanthin can protect PL-MSCs against oxidative stress.

Keywords: Fucoxanthin, Mesenchymal stem cells, Placenta, Oxidative stress

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