

Omega-3 PUFA Alters the Expression Level but Not the Methylation Pattern of the WIF1 Gene Promoter in a Pancreatic Cancer Cell Line (MIA PaCa-2)

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Abstract Pancreatic cancer is the fourth leading cause of death in both males and females, with a 5-year relative survival rate of 8%. The Wnt signaling pathway has a significant role in the pathogenesis of many tumors, including those of pancreatic cancer. Hypermethylation of the Wnt inhibitory Factor-1 (WIF1) gene promoter have been detected in different types of cancer. In contrast, the anticancer effects of long-chain omega-3 PUFA (ALA) have been reported. Regarding its anticancer effects, in this study, we investigated the effects of various concentrations of omega-3 PUFA on expression level and promoter methylation of the WIF1 gene in MIA PaCa-2 cells in 24, 48, and 72 h after treatment. MIA PaCa-2 cells were treated with different concentrations of omega-3 PUFA (25, 50, 100, 250, 500, and 1000 μ M). Cell viability assay was carried out followed by quantitative reverse transcriptase-polymerase chain reaction (qRT-PCR) and methylation-specific PCR (MSP). This investigation suggested that dietary consumption of omega-3 PUFAs (250–1000 μ M) has a significant effect on the proliferation and WIF1 gene expression of the MIA PaCa-2 cancer cell line but no effect on the promoter methylation of this gene. Changes in promoter methylation were not observed in any of the treatments.

Keywords Omega-3 PUFA · Pancreatic cancer · MIA PaCa-2 · Methylation · MSP

