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N-3 PUFAs have antiproliferative and apoptotic effects on human colorectal cancer stem-like cells *in vitro*

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The n-3 polyunsaturated fatty acids have been shown to inhibit the induction and progression of many kinds of tumor and to increase the therapeutic effects of numerous chemotherapeutics, but their anti-cancer effect on cancer stem cells from colorectal cancer has not been described previously. In the present study, we cultivated spheres from the SW620 cell line in serum-free medium and evaluated the features of the spheres by immunofluorescence, cell cycle distribution, resistance to chemotherapeutics, soft agar clone formation, and the spheres were shown to be cancer setm-like cells through tumorigenicity in athymic nude mice. RT-PCR analysis of pluripotency genes, such as Sox-2, Oct-4, and Bmi-1, showed that the spheres were generated by de-differentiation of SW620 cells. To explore the use of n-3 PUFAs in shperes, which were treated with two n-3 PUFAs (DHA/EPA). Treatment of the spheres with DHA and EPA alone or in combination for 72 hours led to apoptosis and the progressive loss of viability and DNA fragmentation and an increase in annexin V expression. DHA and EPA can enhance the chemotherapeutic sensitivity effect of 5-Fu and mitomycin C, especially DHA combined with EPA. Taken together, these results provide evidence that n-3 PUFAs exert a direct anti-cancer action that may contribute to their anti-proliferative and pro-apoptotic effect on the cancer setm-like cells.

Key words: colorectal cancer; cancer stem-like cells; n-3 PUFAs; EPA; DHA; apoptosis.

Biography

Ting Yang has completed her Ph.D at the age of 33 years from Department of Surgery, The First Affiliated Hospital, Sun Yat-Sen University. She has published more than 7 papers in reputed journals.

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