Therapeutic potential of fucoxanthin in triple-negative breast cancer via Wnt/β-Catenin

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Track: Research
Theme: Treatment

ABSTRACT

Triple-negative breast cancer (TNBC) is a highly aggressive form of breast cancer associated with poor prognosis and limited treatment options. The Wnt/β-catenin signaling pathway plays a critical role in regulating cell survival, proliferation, and differentiation, and its dysregulation is closely linked to TNBC progression and metastasis. This study explores fucoxanthin (FX), a natural carotenoid from brown seaweed, as a potential therapeutic agent targeting the Wnt/β-catenin pathway in TNBC. FX demonstrates promising anti-cancer activities, including inhibition of tumor cell growth, induction of apoptosis, downregulation of key signaling components, and suppression of transcriptional activity. The compound also shows potential in overcoming chemoresistance and exerts anti-inflammatory and antioxidant effects. While preclinical results are promising, further clinical studies are essential to confirm its safety, efficacy, and optimal use in TNBC treatment.

Keywords: TNBC, Wnt/?-catenin, fucoxanthin, drug resistance, anticancer