Free Fatty Acid Receptor (FFAR) Agonists Inhibit Proliferation of Human Ovarian Cancer Cells

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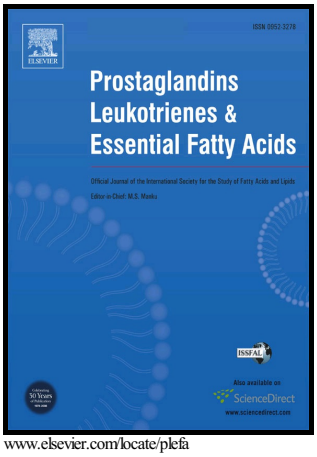

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Free Fatty Acid Receptor (FFAR) Agonists Inhibit Proliferation of Human Ovarian Cancer Cells

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Abstract

Many cellular actions of omega-3 fatty acids are mediated by two G protein-coupled receptors, FFA1 and FFA4, free fatty acid receptor (FFAR) family members that are activated by these dietary constituents. FFAR agonists inhibit proliferation of human prostate and breast cancer cells. Since omega-3 fatty acids can inhibit ovarian cancer cell growth, the current study tested the potential role of FFARs in the response. OVCAR3 and SKOV3 human ovarian cancer cell lines express mRNA for FFA1; FFA4 mRNA was detected at low levels in SKOV3 but not OVCAR3. Lysophosphatidic acid (LPA) and epidermal growth factor (EGF) stimulate proliferation of both cell lines; these responses are inhibited by eicosopentaneoic acid (EPA) and by GW9508, a synthetic FFAR agonist. The LPA antagonist Ki16425 also inhibited LPA- and EGF-induced proliferation; FFAR agonists had no further effect when added with Ki16425. The results suggest that FFARs are potential targets for ovarian cancer therapy.

Keywords: omega-3 fatty acids; G protein-coupled receptors; free fatty acid receptors; lysophophatidic acid; epidermal growth factor