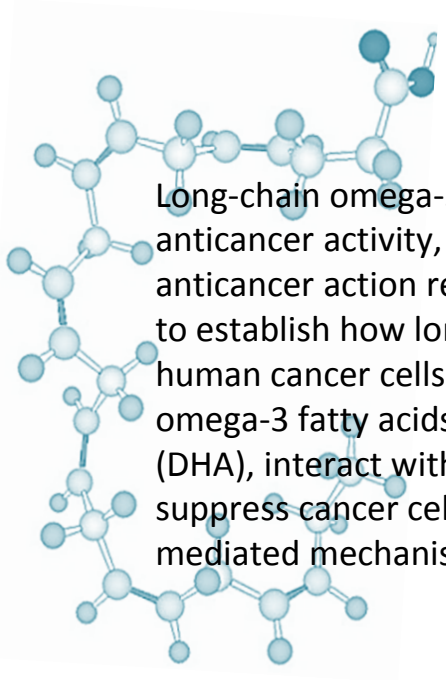
The Role Of SOD1 in Docosahexanoic Acid-induced Cytotoxicity in Human Cancer Cells

Wei-Qun Ding

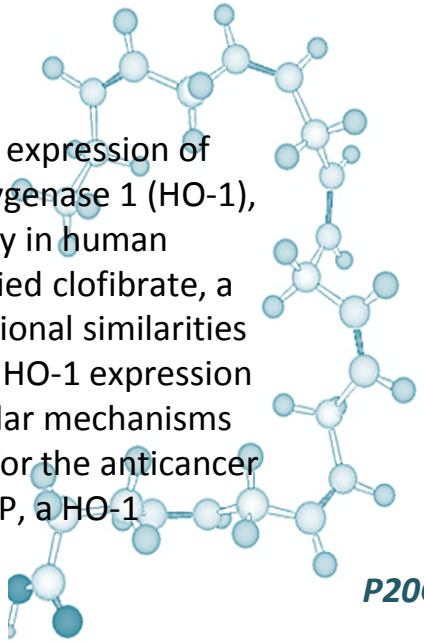


Background

Long-chain omega-3 fatty acids are known to have anticancer activity, however the mechanisms of their anticancer action remains elusive. The research aims to establish how long-chain omega-3 fatty acids kill human cancer cells. It is hypothesized that long-chain omega-3 fatty acids, such as docosahexanoic acid (DHA), interact with cellular antioxidant enzymes and suppress cancer cell viability via oxidative stress-mediated mechanisms.

Advance

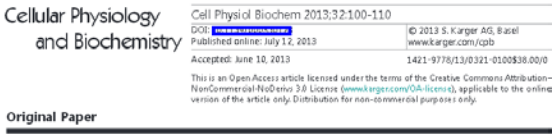
DHA was discovered to induce the expression of the antioxidant enzyme, heme oxygenase 1 (HO-1), through the Nrf2 signaling pathway in human cancer cells. The study also identified clofibrate, a compound that shares many functional similarities with DHA, that likewise enhances HO-1 expression in the model systems. Other cellular mechanisms were also identified that account for the anticancer action of zinc protoporphyrin (ZnPP, a HO-1 inhibitor).



Research article

Characterization of docosahexaenoic acid (DHA)-induced heme oxygenase-1 (HO-1) expression in human cancer cells: the importance of enhanced BTB and CNC homology 1 (Bach1) degradation ☆

Shuai Wang[a], Bethany N. Hannafon[a], Roman F. Wolf[a], Jundong Zhou[b], Jori E. Avery[a], Jinchang Wu[b], Stuart E. Lind[c], Wei-Qun Ding[a].



Zinc at Sub-Cytotoxic Concentrations Induces Heme Oxygenase-1 Expression in Human Cancer Cells

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Zinc protoporphyrin suppresses cancer cell viability through a heme oxygenase-1-independent mechanism: The involvement of the Wnt/β-catenin signaling pathway

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