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## Gamma-linolenic acid, arachidonic acid, and eicosapentaenoic acid as potential anticancer drugs.

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### Abstract

Several in vitro studies and limited in vivo investigations showed that some cis-unsaturated fatty acids (c-UFAs) such as gamma-linolenic acid, arachidonic acid, and eicosapentaenoic acid have selective tumoricidal actions. This cytotoxic action of c-UFAs is produced by augmentation of free-radical generation and lipid peroxidation in tumor cells but not in normal cells. Moreover, lymphokines such as interferon and tumor necrosis factor seem to produce their antitumor effects by inducing the release of c-UFAs from the cell-membrane lipid pool and free-radical generation, and several anticancer drugs, especially doxorubicin and vincristine, have the capacity to augment free-radical generation and promote lipid peroxidation. Tumor cells are known to contain low amounts of c-UFAs, have decreased capacity to generate free radicals and lipid peroxides, and are highly susceptible to free radical-induced cytotoxicity compared with normal cells. In addition, c-UFAs and their products can modulate the immune response, augment the respiratory burst of neutrophils and free-radical generation by macrophages, and modify genetic damage induced by mutagens and carcinogens. These evidences, coupled with the observation that the cancer incidence is low in Eskimos on traditionally high-c-UFA diets, suggests that c-UFAs can be exploited as possible anticancer agents either alone or in combination with lymphokines and cancer chemotherapy.

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