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## Tumoricidal action of cis-unsaturated fatty acids and their relationship to free radicals and lipid peroxidation.

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### Abstract

Cis-unsaturated fatty acids (c-UFAs) such as gamma-linolenic acid (GLA), arachidonic acid (AA) and eicosapentaenoic acid (EPA) can kill tumor cells selectively in vitro. As c-UFAs have the ability to augment free radical generation, the effect of antioxidants, free radical quenchers and augmentors of free radical generation such as iron and copper salts on fatty acid-induced tumor cell death was studied. In addition, the role of lipid peroxidation in the tumoricidal action of c-UFAs was also examined. Results indicate that vitamin E, uric acid, glutathione peroxidase, superoxide dismutase and ATP can block, whereas iron, copper and catalase enhance the tumoricidal action of GLA. The ability of GLA, AA and EPA to kill tumor cells correlated with the amount of lipid peroxidation these fatty acids can induce as measured by thiobarbituric acid test. It was also observed that <sup>14</sup>C-labelled linoleic acid uptake was almost the same whereas that of <sup>14</sup>C-labelled arachidonic acid and eicosapentaenoic acid were substantially less in tumor cells compared to normal cells. Tumor cells incorporated major portions of the fatty acids in the ether lipid and phospholipid fractions, whereas normal cells incorporated the fatty acids primarily in the phospholipid fraction. These results suggest that c-UFA-induced tumoricidal action is a free radical dependent process and that there are significant differences between normal and tumor cells in fatty acid uptake and distribution.

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