

# Abstract

Clin Cancer Res. 2006 Aug 1;12(15):4662-70.

## Effect of altering dietary omega-6/omega-3 fatty acid ratios on prostate cancer membrane composition, cyclooxygenase-2, and prostaglandin E2.

Kobayashi N, Barnard RJ, Henning SM, Elashoff D, Reddy ST, Cohen P, Leung P, Hong-Gonzalez J, Freedland SJ, Said J, Gui D, Seeram NP, Popoviciu LM, Bagga D, Heber D, Glaspy JA, Aronson WJ.

Department of Urology, Division of Clinical Nutrition and Hematology-Oncology, University of California, Los Angeles School of Medicine, 90095-1738, USA.

**PURPOSE:** To determine whether altering the dietary content of omega-6 (n-6) and omega-3 (n-3) polyunsaturated fatty acids affects the growth of androgen-sensitive prostate cancer xenografts, tumor membrane fatty acid composition, and tumor cyclooxygenase-2 and prostaglandin E(2) (PGE(2)) levels.

**EXPERIMENTAL DESIGN:** Individually caged male severe combined immunodeficiency mice were fed isocaloric 20% kcal fat diets with the fat derived either primarily from n-6 fatty acids (n-6 group) or with the fat consisting of n-6 and n-3 fatty acids in a ratio of 1:1 (n-3 group), and injected s.c. with Los Angeles Prostate Cancer 4 (LAPC-4) cells. Tumor volumes and mouse weights were measured weekly, caloric intake was measured 3 days per week, and tumors and serum were harvested at 8 weeks postinjection.

**RESULTS:** Tumor growth rates, final tumor volumes, and serum prostate-specific antigen levels were reduced in the n-3 group relative to the n-6 group. The n-3 group tumors had decreased proliferation (Ki67 staining) and increased apoptosis (terminal nucleotidyl transferase-mediated nick end labeling staining). In vitro proliferation of LAPC-4 cells in medium containing n-3 group serum was reduced by 22% relative to LAPC-4 cells cultured in medium containing serum from the n-6 group. The n-6/n-3 fatty acid ratios in serum and tumor membranes were lower in the n-3 group relative to the n-6 group. In addition, n-3 group tumors had decreased cyclooxygenase-2 protein and mRNA levels, an 83% reduction in PGE(2) levels, and decreased vascular endothelial growth factor expression.

**CONCLUSION:** These results provide a sound basis for clinical trials evaluating the effect of dietary n-3 fatty acids from fish oil on tumor PGE(2) and membrane fatty acid composition, and serum and tumor biomarkers of progression in men with prostate cancer.

PMID: 16899616

FREE FULL TEXT