TRAMP carcinogenesis is associated with a loss of COX expression and resistance to the tumor suppressive effects of omega-3 fatty acids.

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ABSTRACT

INTRODUCTION

Epidemiologic and cell culture studies have suggested that diets rich in omega-3 fatty acids are associated with a lower risk of prostate cancer. In brief, diets rich in saturated fat and omega-6 fatty acids are hypothesized to increase risk while diets rich in omega-3 fatty acids are proposed to reduce risk.

In the TRAMP model, a prostate cancer model developed in mice, high concentrations of omega-3 fatty acids and prostaglandins were found to elevate prostate cancer in wild-type mice and are associated with up-regulated tumor behavior and breakdown of angiogenesis and invasiveness.

OBJECTIVES

To determine if diets rich in omega-3 fatty acids derived from fish oil modulate prostate carcinogenesis in the TRAMP model

To investigate the effects of diets rich in omega-3 fatty acids derived from fish oil on prostate prostaglandin production in control and TRAMP mice.

RESULTS

Dietary lipid composition has no effect on time to palpable tumor formation

CONCLUSIONS

• A diet rich in fish oil diet does not inhibit prostate carcinogenesis in the TRAMP model

• Prostate fatty acids are changed in response to patterns of fatty acids found in the diet

• Prostaglandin synthesis is affected by dietary fatty acid content in wild-type mice but not in the TRAMP model

• TRAMP carcinogenesis is associated with a loss of COX expression

• The loss of COX expression in TRAMP results in a resistance to the chemopreventive effects of an omega-3 fatty acid rich diet. This works suggests that dietary changes in p53 and Rb pathways alters the cellular response to fatty acids and PGs.

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References: