

Chemistry Department

The Etiology and Prevention of Breast, Prostate
and Other Human Cancers

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Abstract

Experiments on estrogen metabolism, formation of DNA adducts, mutagenicity, cell transformation and carcinogenicity led to and support the hypothesis that reaction of specific estrogen metabolites, mostly the electrophilic catechol estrogen-3,4-quinones, with DNA can generate the critical mutations to initiate breast and other human cancers. Analysis of depurinating estrogen-DNA adducts in urine shows that women at high risk or with breast cancer have high levels of the adducts, indicating the critical role of adduct formation in breast cancer initiation. Men with prostate cancer or non-Hodgkin lymphoma also have high levels of estrogen-DNA adducts. This knowledge of the first step in cancer initiation suggests the use of specific antioxidants that can block formation of the adducts by chemical and biochemical mechanisms. Two antioxidants, N-acetylcysteine and resveratrol, are prime candidates to prevent breast and other human cancers because in various in vitro and in vivo experiments they reduce formation of estrogen-DNA adducts.

**Dr. Cavalieri will be available to meet with
students from 1:00 to 1:30 p.m. in WSB-344.**