Selenium and prostate cancer prevention: insights from the selenium and vitamin E cancer prevention trial (SELECT).

Nicastro HL, Dunn BK.
Cancer Prevention Fellowship Program, Nutritional Science Research Group, Division of Cancer Prevention, National Cancer Institute, 9609 Medical Center Dr, Rockville, MD 20850, USA.

Abstract
The Selenium and Vitamin E Cancer Prevention Trial (SELECT) was conducted to assess the efficacy of selenium and vitamin E alone, and in combination, on the incidence of prostate cancer. This randomized, double-blind, placebo-controlled, 2 × 2 factorial design clinical trial found that neither selenium nor vitamin E reduced the incidence of prostate cancer after seven years and that vitamin E was associated with a 17% increased risk of prostate cancer compared to placebo. The null result was surprising given the strong preclinical and clinical evidence suggesting chemopreventive activity of selenium. Potential explanations for the null findings include the agent formulation and dose, the characteristics of the cohort, and the study design. It is likely that only specific subpopulations may benefit from selenium supplementation; therefore, future studies should consider the baseline selenium status of the participants, age of the cohort, and genotype of specific selenoproteins, among other characteristics, in order to determine the activity of selenium in cancer prevention.