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Vitamin E succinate inhibits human prostate cancer cell growth via modulating cell cycle regulatory machinery.

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Several epidemiological studies have demonstrated that vitamin E is a chemopreventative agent for prostate cancer. alpha-Tocopheryl succinate (VES), a derivative of vitamin E, effectively modulates prostate cancer cell growth. However, little is known about the mechanisms regarding this action. Here we show that VES causes human prostate cancer cell LNCaP arrest at G1 phase. This effect is accomplished through VES significantly decreasing expression of the cell cycle regulatory proteins cyclin D1, D3, and E, cdk2 and 4, but not cdk6. Furthermore, VES reduces cdk4 kinase activity, Rb phosphorylation, and cyclin E mRNA expression. Recently there is increasing interest in the protective effect of the VES and selenium combination on prostate cancer. Here we show that VES and selenium work through different mechanisms to exert their inhibitory effects on prostate cancer cells. Taken together, our studies suggest that VES-mediated prostate cancer cell G1/S arrest is a consequence of the regulation of multiple molecules of the cell cycle regulatory machinery.

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