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Induction of Growth Inhibition and Apoptosis by Resveratrol in Human Prostate Cancer Cells

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Resveratrol (trans-3,5,4'-trihydroxystilbene) is a natural phytoalexin present in grapes, fruits, peanuts and red wine. Resveratrol has been reported cancer chemopreventive effects. The aim of the present study was to further elucidate the possible mechanisms by which resveratrol exerts its anti-proliferative action in human prostate cancer PC-3 cell line. Resveratrol treatment of PC-3 cells resulted in a dose dependent inhibition of the cell growth, which was associated with arrest of the cell cycle and induction of apoptosis as shown by DNA flow cytometry analysis. Resveratrol induces arrest in the S phase at low concentrations (12.5-25 μ M), but high concentration (50 μ M) does not induce S phase accumulation in PC-3 cells, which was associated with induction of cyclin-dependent kinase (Cdk) inhibitor p21 and Cdk inhibitor p16. The activities of both caspase-9 and caspase-3 in resveratrol-treated PC-3 cells were significantly increased and the levels of poly(ADP-ribose) polymerase (PARP) were decreased in a concentration-dependent manner. In addition, resveratrol down-regulated the expression of Bcl-2 without alteration of Bax levels. Taken together, these findings suggest that resveratrol may provide a potential cell cycle blocker as well as a cancer chemopreventive agent. [This study was supported by a grant of the Korea Health 21 R&D Project, Ministry of Health & Welfare, Republic of Korea. (02-PJ1-PG3-20905-0009).]

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