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The effects of HDAC inhibitors on proliferation and apoptosis in PC3 cells.

S.Y. Yang, D.K. Kim and Y.Y. Sheen
college of pharmacy, Ewha womans university, Seoul, Korea

The acetylation of histone is one of the mechanisms involved in the regulation of gene expression and is tightly controlled by two core enzymes, histone acetyltransferase (HAT) and deacetylase (HDAC). There are several reports that imbalance of HAT and HDAC activity is associated with abnormal behavior of the cells in morphology, cell cycle, differentiaton and carcinogenesis. Recently, an increasing number of structurally diverse HDAC inhibitors have been identified that they inhibit proliferation and induce differentiation and/or apoptosis of tumor cells in vivo and in vitro.

In this study, we have examined HDAC inhibitors, such as trichostatin A (TSA), HC-toxin and suberoylanilide hydroxamic acid (SAHA), induce growth inhibition, cell cycle arrest and apoptosis in human prostate cancer cell line, PC3. Also, we have investigated the effects of novel HDAC inhibitor, IN2001. The growth inhibition, cell cycle arrest and apoptosis by HDAC inhibitors were determined using SRB assay and flow cytometry. We found that IN2001 as well as TSA inhibited cell growth dose dependently in PC3 cells. The growth inhibition with HDAC inhibitors was associated with profound morphological change. HDAC inhibitors showed cell cycle arrest at G0/G1 in PC3 cells in a dose dependent manner and time dependent manner. These findings height the possibility of developing HDAC inhibitors as potential anticancer therapeutic agents for the treatment of prostate cancer.

Keyword : PC3 cell, human prostate cancer cell, Trichostatin A, HC-toxin, HDAC inhibitors