【P-50】

Effects of Histone Deacetylase Inhibitors on Human breast Cancer Cells

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Histone deacetylase (HDAC) inhibitors are new class of chemotherapeutic drugs able to induce tumor cell apoptosis and/or cell cycle arrest. In this study, we have examined the effects of HDAC inhibitors on ER positive (T47D cells) and ER negative (MDA-MB-231 cells) human breast cancer cell lines. Regardless of the expression of estrogen receptor, HDAC inhibitors induced growth inhibition in both cell lines.The growth inhibition by HDAC inhibitors was associated with profound morphological change.

HDAC inhibitors modulated cell cycle and eventually induced apoptosis in the cell type specific manner. In ER positive human breast cancer, T47D cell, HDAC inhibitors induced cell cycle arrest at G2/M dose-dependentlyat 12, 24, and 48hr. In addition, Trichostatin A and IN 2001 caused potent apoptosis of T47D human breast cancer cells and this apoptosis might be involved in an increase of caspase-3/7 activity. HC-toxin also evoked apoptosis of T47D cells but did not increase caspase-3/7 activity. HC-toxin induced apoptosis might be mediated through apoptotic pathway other than caspase-3/7 activation. In ER negative human breastcancer, MDA-MB-231 cell HDAC inhibitors induced G2/M arrest at 12hr. However at 24hr and 48 hr only apoptosis was examined dose-dependently.

Keyword : human breast cancer, histone deacetylase inhibitors