J Cancer Sci Ther 2014, 6:10
http://dx.doi.org/10.4172/1948-5956.S1.035

OMICS Group Conferences
Accelerating Scientific Discovery

4th World Congress on
Cancer Science & Therapy
October 20-22, 2014 DoubleTree by Hilton Hotel Chicago-North Shore Conference Center, USA

The cell cycle arrest and the anti-invasive effects of nitrogen-containing bisphosphonates are not mediated by DBF4 in breast cancer cells

Fatemeh Elahian
Zanjan University of medical sciences, Iran

Introduction: DBF4 is an essential protein kinase required for DNA replication and plays a critical role in the S-phase checkpoint. It is also required for cell surface adhesion. Yeast DBF4 analog (YDR052C) may be a target of nitrogen-containing bisphosphonates (NBPs) and anti-invasive and S-phase arrest-inducing effects of NBPs may be mediated via this protein.

Objectives: Further studies are needed to confirm these mechanisms in human cells.

Aims: The present study focuses on analysis of the relationship between NBPs treatment and DBF4 expression levels in human breast cancer cells and the consequences on the cell cycle and migration behavior.

Methods: The effects of Pamidronate, risedronate, or zoledronate on BT20, MDA-MB231 and T47D cell viability and DBF4 expression were measured via MTT assays and western blotting. FACS cell cycle analyses and invasion assays were conducted in cells in the presence of NBPs to identify any correlations between DBF4 expression and S-phase arrest or anti-invasive effects of the bisphosphonates.

Results: Zoledronate transiently down-regulated DBF4 expression in all cell lines, but after 72 h, DBF4 expression returned to the control levels. Following treatment of the tumor cells, the number of cells in S-phase was increased. Pamidronate and zoledronate showed anti-invasive effects in BT20 cells. The MDA-MB231 cells appear to be more invasive, as a reduction of invasiveness was only observed after 72 h of the drug exposure.

Conclusions: We finally concluded that the anti-invasive and cell cycle arrest-inducing effects NBPs are not DBF4 mediated, and other mediators are therefore needed to explain the observed complex behaviors.

dr.elahian@yahoo.com

Aberrant expression of redox protein Ape1 in colon cancer stem cells

Gang-Ming Zou
Shanghai Jiao Tong University, China

Ape1 is an important redox protein, essential for specific cytokine-induced signal transduction. Ape1 signaling is also important in regulating the growth of cancer cells, including colon cancer cells. The present study investigated whether Ape1 signaling plays a role in the regulation of colon cancer stem cell (CCSC) growth. The results showed that Ape1 was aberrantly expressed in CCSCs, as determined by quantitative (q)PCR assay. A laser confocal microscopy assay demonstrated that the Ape1 protein was mainly distributed in the nuclei, but not the cytoplasm, of the CSCs. Treatment of CCSCs with Ape1 redox inhibitor (E3330) significantly affected growth *in vitro*. In colon cancer xenograft mice, *in vivo* administration of E3330 enhanced tumor responses to the chemotherapeutic drug, 5-fluorouracil (5-FU). Furthermore, the combination of E3330 and 5-FU evidently increased the cytotoxicity of 5-FU in CSC growth. In the qPCR assay, the CCSCs were demonstrated to express the dominant ATP-binding cassette sub-family G member 2 (ABC-G2), but not the multidrug resistance 1, genes. Thus, we hypothesized that drug resistance in CCSCs is mediated by ABC-G2. Since CSCs are involved in cancer metastasis, the Ape1 inhibitor may be a potential agent in the inhibition of colon cancer growth and metastasis.