

Cancer Diagnostics Conference & Expo

June 13-15, 2016 Rome, Italy

Differences of signaling pathways and miRNA expression in colon and breast carcinoma cell lines on hypoxic condition

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Breast and colon cancer are known to be frequent causes of morbidity and mortality in men and women around the world. In addition, many studies showed that several biomarkers are common among these malignancies. Low oxygen levels have been shown to promote self-renewal in many stem cells. In tumors, hypoxia is associated with aggressive disease course and poor clinical outcomes controlling of proliferation, angiogenesis, metabolism, immortalization, migration, carcinogenesis and apoptosis expression. In this study we aim to identify the distribution of VEGF, β -catenin, Oct-4, Ki-67, CD-133, miRNAs expressions by analyzing of Dicer, Drosha and eIF2 α in primary and metastatic colon and breast carcinoma cell lines. Human primary (MCF-7) and metastatic (M4A4) breast adenocarcinoma, primary (Colo-320) and metastatic (Colo-741) colon carcinoma cell lines were cultured in RPMI-1640 containing 10% FCS, 1% L-glutamine and 1% penicillin-streptomycin until 80% of confluence. Cells were separated in two groups; control and hypoxic groups. Control group of cells were cultured under 5% CO₂ humidified environment was used to provide normoxic conditions. To provide the 3% hypoxic condition, a gas mixture of 5% CO₂, 3% O₂ and 94% N₂ was used. They were cultured 36 h in their conditions and were then fixed with 4% paraformaldehyde and distribution of anti-VEGF, anti- β -catenin, anti-Oct-4, anti-Ki-67, anti-CD-133, anti-Dicer, anti-Drosha and anti-eIF2 α were investigated using indirect immunoperoxidase staining. Under hypoxic condition, immunoreactivity of Oct-4 and CD-133 were increased in all cell lines, Ki-67 immunoreactivity was more detectable in MCF-7 cell after hypoxia. VEGF immunoreactivity was also strongly detected after hypoxia in metastatic colon and breast carcinoma cell lines. While Drosha immunoreactivity was similar in both condition and all types of cell lines, Dicer and eIF2 α immunoreactivities were increased after hypoxic condition both primary and metastatic colon and breast carcinoma cell lines. Our results demonstrated that, hypoxic condition induced of stem cell, proliferation and angiogenetic properties of primary and metastatic breast and colon carcinoma cell lines. In addition, hypoxia may also trigger miRNA biogenesis in primary and metastatic cancers.

Biography

H Seda Vatansever has completed her PhD from Liverpool University and all academic studies from Celal Bayar University School of Medicine. She has published more than 80 papers in reputed journals and has been serving as an Editorial Board Member of repute. Her interest is in cancer cell biology, apoptosis, stem cell (both embryonic and mesenchymal) culture and differentiation and oocyte culture.

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