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EMERGING DISEASES AND PREVENTIVE MEDICINE

The Role of miR-182 and miR-214 in Cisplatin Resistance of Triple-Negative Breast Cancer Cells

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ABSTRACT

MicroRNAs (miRNAs) are small short non-coding RNA molecules about 22 nucleotides long which were found to be the most expressed class of non-coding RNAs in eukaryotic somatic tissues. It is well established both from experimental and clinical studies that miRNAs play an emerging role in essential biological activities, such as the development of resistance to targeted chemotherapeutic agents. WW domain-containing oxidoreductase (WWOX) is a tumor suppressor gene. Wwox protein is reduced or absent in about two thirds of breast cancer cases. Wwox protein loss is a frequent event in triple-negative breast cancer (TNBC). TNBC is a heterogeneous, highly aggressive and difficult to treat tumor type. Wwox loss contributes to resistance to cisplatin therapy in patients with TNBC. Here, we aimed to investigate the potential role of microRNAs (miRNAs) in cisplatin therapy resistance of Wwox-deficient TNBC cells. This was a cell culture study. miRNA expression profiling was analyzed by LightCycler 480 system. We used a miRNA Set Enrichment Analysis (miSEA) tool to integrate experimental data with literature-based biological knowledge to infer new hypothesis. Up-regulation of miR-182 and down-regulation of miR-214 were significantly positively correlated with cisplatin resistance in Wwox-deficient TNBC cells. Overexpression of miR-182 and reduced expression of miR-214 may involve in cisplatin resistance of Wwox-negative TNBC cells through deregulating the DNA repair/apoptosis/AKT signaling pathways. These data highlight the mechanism by which Wwox regulates cisplatin resistance of TNBC and the potential use of Wwox as a predictor biomarker for cisplatin resistance.

BIOGRAPHY

Bahadir Batar is an Assist. Prof. at the Tekirdag Namik Kemal University Medical School, Turkey. He received his Ph.D. from Cerrahpasa Medical School of Istanbul University in 2013, Turkey. He has worked as a postdoctoral fellow at The Ohio State University Comprehensive Cancer Center during the 2014-2016. His primary research interest is in the area of molecular biology and genetics of cancers. He has been working on projects to understand the role of loss of the FHIT and WWOX fragile genes in initiation and progression of several cancers and therapeutic resistance.

PUBLICATIONS

Bahadir Batar, DNA repair gene XPD and XRCC1 polymorphisms and the risk of childhood acute lymphoblastic leukemia

Bahadir Batar, Polymorphisms of DNA repair genes XPD and XRCC1 and risk of cataract development

Bahadir Batar, Polymorphisms of the DNA repair genes XPD and XRCC1 and the risk of age-related macular degeneration

Bahadir Batar, WWOX–Brca1 interaction: role in DNA repair pathway choice

Bahadir Batar, Fragile genes that are frequently altered in cancer: players not passengers

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