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The Role of Micro-Ribonucleic Acid-182 and Micro-Ribonucleic Acid-214 in Cisplatin Resistance of Triple-Negative Breast Cancer Cells

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Abstract : Micro-ribonucleic acids (miRNAs) are small short non-coding ribonucleic acid molecules about 22 nucleotides long. miRNAs play a key role in response to chemotherapeutic agents. WW domain-containing oxidoreductase (WWOX) gene encodes a tumor suppressor protein. Loss or reduction of Wwox protein is observed in many breast cancer cases. WWOX protein deficiency is increased 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, the aim of the study was to investigate the potential role of 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. miRNA Set Enrichment Analysis tool was used to integrate experimental data with literature-based biological knowledge to infer a new hypothesis. Increased miR-182 and decreased miR-214 were significantly correlated with cisplatin resistance in WWOX-deficient TNBC cells. miR-182 and miR-214 may involve in cisplatin resistance of WWOX-deficient TNBC cells by deregulating the DNA repair, apoptosis, or protein kinase B 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.

Keywords : cisplatin, microRNA, triple-negative breast cancer, WWOX
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