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SKA1: A therapeutic target for chemo-resistance in human osteosarcoma

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The combination of aggressive surgery and neoadjuvant chemotherapy is also the major treatment for human osteosarcoma nowadays. However, the issue of chemo-resistance development has sustained and poses a great challenge. Researchers have reported that hypoxia may lead to drug resistance in many kinds of solid tumors. The mechanism is not very clear yet. The purpose of this study is to explore how hypoxia leading to chemo-resistance in osteosarcoma cells. We scanned normoxia and hypoxia cultured osteosarcoma cells *in silico* in three replicates to find the differential expressed gene under hypoxic condition, and this gene was overexpressed by lenti-virus vector, then real-time PCR and western were utilized to detect the expression of three drug resistance related genes *ABCB1*, *ABCC2*, and *GSTP1*. Cell Counting Kit-8 (CCK8) assay was performed to evaluate the proliferation of cells after lenti-virus transfected. 545 differentially expressed genes were identified based on the microarray analysis. Attention was focused on the *SKA1* gene as a possible downstream target of hypoxia by means of bioinformatics. *SKA1* overexpression reduced the expression of three multidrug resistant genes *ABCB1*, *ABCC2* and *GSTP1*. Also, we demonstrated that *SKA1* overexpression enhanced the sensitivity of two chemotherapeutic drugs used for osteosarcoma patients. Our study made an attempt to identify the downstream target genes that are altered in the hypoxia-cultured osteosarcoma cell line by microarray analysis. We demonstrated that the expression of *SKA1* was significantly decreased in a hypoxic environment. And SKA1 may function as a chemosensitizer in osteosarcoma. A strategy to enhance its expression may prove to be beneficial for the treatment of osteosarcoma.

Biography

Qiong Ma has her expertise and interest in scientific study on human osteosarcoma, especially about the proliferation, invasion and metastases of tumor cells. She has studied tumor cells under hypoxic conditions.

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