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SHIKONIN ENHANCES THE ANTITUMOR EFFECTS OF CABAZITAXEL IN PROSTATE CANCER STEM CELLS

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Abstract

Cancer stem cells (CSCs) are a small population among cancer cells, defined as capable of self-renewal, and driving tumor growth, metastasis, and therapeutic relapse. The development of therapeutic strategies to target CSCs is of great importance to prevent tumor metastasis and relapse. In the last decade, traditional Chinese medicines (TCM) have been increasingly used as an additional treatment strategy following surgery, chemotherapy, or radiation therapy for cancer patients worldwide, and accumulating evidences have been shown that some of these substances have significant effects also on CSCs. In our studies the effect of shikonin on prostate CSCs was analysed. Sphere formation assay was used to generate prostate CSCs. Celltiter blue assay and Celltiter 96 aqueous one solution proliferation assay were used to evaluate the viability and proliferation. To measure migration and invasion the scratch wound healing assay and transwell assays were applied. Typical CSC markers were analysed by flow cytometry and quantitative RT-PCR. Furthermore, to characterize the apoptotic process reactive oxygen species (ROS) and mitochondrial membrane potential were determined. Shikonin inhibits the viability and proliferation of prostate CSCs in a dose-dependent manner and enhances the effect of cabazitaxel, which is a secondline chemotherapeutic drug in advanced prostate cancer concerning viability, proliferation, apoptosis, migration, and invasion. Shikonin induces CSC apoptosis through inducing ROS generation, and disrupting the mitochondrial membrane potential. Furthermore, shikonin suppresses the expression of ALDH3A1 and ABCG2 in prostate CSCs, two markers related to drug-resistance. In conclusion, shikonin enhances the cytotoxic activity of cabazitaxel in prostate CSCs. Further studies must show to what extent shikonin is also able to abolish the resistance of tumor cells to cabazitaxel.

Biography

Lili Wang is a PhD student at the LIFE Center of the University of Munich, Germany. She characterizes cancer stem cells in prostate cancer and develops new therapies against cancer stem cells and chemotherapy resistant cancer cells.

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