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Silver nanoparticles modulate abc transporter activity and enhance chemotherapy in multidrug resistant cancer

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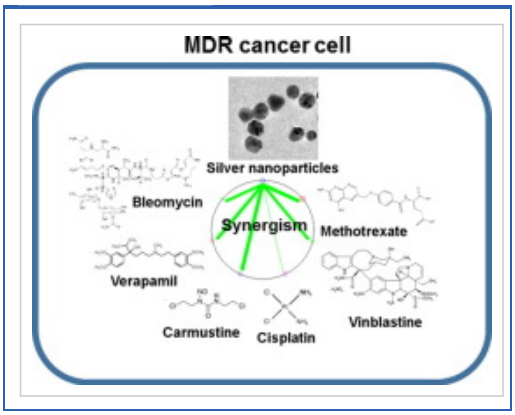

Abstract

The emergence of multidrug resistant (MDR) cancer phenotypes dramatically attenuates the efficiency of antineoplastic drug treatments often leading to the failure of chemotherapy. Therefore there is an urgent need to engineer new therapeutically useful agents and propose innovative approaches able to defeat

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resistant cancer cells. Although the remarkable anti-cancer features of silver nanoparticles (AgNPs) have already been delineated their impact on MDR cancer has never been investigated. Herein, we report that AgNPs have a notable anti-proliferative effect and induce apoptosis mediated cell death both in drug sensitive and in MDR cancer cells. Furthermore we show evidence that AgNPs exert an inhibitory action on the efflux activity of MDR cancer cells which feature could be exploited to enhance drug accumulation. We verified synergistic interactions of AgNPs with six different antineoplastic agents on drug resistant cells which emphasizes the excellent potential of AgNPs as combinational partners in the chemotherapy of MDR cancer.

Keywords:
Silver nanoparticles, multidrug resistance, combinational therapy

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