

Quinacrine and curcumin synergistically increased the breast cancer stem cells death by inhibiting ABCG2 and modulating DNA damage repair pathway

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Abstract:

Cancer stem cell like cells (CSCs) present a challenge in the management of cancers due to their involvement in the development of resistance against various chemotherapeutic agents. Over expression of ABCG2 transporter gene is one of the factors responsible for drug resistance in CSCs, which causes efflux of therapeutic drugs from these cells. The development of inhibitors against CSCs has not achieved any significant success, till date. In this work, we have evaluated the anti-proliferative activity of curcumin (Cur) and quinacrine (QC) against CSCs using in vitro model system. Cur and QC synergistically inhibited the proliferation, migration and invasion of CSCs enriched side population (SP) cells of cigarette smoke condensate induced breast epithelial transformed (MCF-10A-Tr) generated metastatic cells. Cur + QC combination increased the DNA damage and inhibited the DNA repair pathways in SP cells. Uptake of QC increased in Cur pre-treated SP cells and this combination inhibited the ABCG2 activity by the reduction of ATP hydrolysis in cells. In vitro DNA binding reconstitution system suggests that QC specifically binds to DNA and caused DNA damage inside the cell. Decreased level of ABCG2, representative cell survival and DNA repair proteins were noted after Cur + QC treatment in SP cells.

Biography:

Deepika Nayak is pursuing her PhD School of Biotechnology, KIIT, Deemed to be University. She is the ICMR (Indian Council for Medical Research) Senior Research Fellow. She has published 14 in many reputed peer reviewed journals..

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