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Microarray analysis reveals salinomycin-induced apoptosis and activated endoplasmic reticulum stress of human prostate cancer PC-3 cells

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The anticancer activity of salinomycin has evoked excitement due to its recent identification as a selective inhibitor of breast cancer stem cells (CSCs) and its ability to reduce tumor growth and metastasis in vivo. Previously, we reported that salinomycin induces apoptosis of human prostate cancer cells through accumulated reactive oxygen species and mitochondrial membrane depolarization. In this study, we performed cDNA microarray analysis for gene expression profiles after salinomycin treatment in prostate PC-3 cells. Consequently, it was identified that salinomycin regulates mitochondria related apoptosis signaling and cell cycle related gene expression, which were consistent with our previous reports. Also, the further analysis showed that salinomycin activates endoplasmic reticulum (ER) stress - and unfolded protein response (UPR) - related gene expression. Therefore, we confirmed those genes and proteins expression by using RT-PCR and western blot analysis. As a result, several transcripts including DDIT3, EIF2AK3, HSPA5 and ATF4 were up-regulated genes that have been implicated in apoptosis-related ER stress and UPR genes. These results are the first report of cDNA microarray profiling indicating salinomycin-mediated apoptosis and ER stress of prostate cancer cells.

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