

# Baicalein, a Natural Anti-Cancer Compound, Alters MicroRNA Expression Profiles in Bel-7402 Human Hepatocellular Carcinoma Cells.

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## Abstract

### BACKGROUND/AIMS:

Baicalein has been shown to possess significant anti-hepatoma activity by inhibiting cell proliferation. Whether the anti-proliferative effect of baicalein is related to its modulation of miRNA expression in hepatocellular carcinoma (HCC) is still unknown.

### METHODS:

The anti-proliferative effects of baicalein on HCC cell line Bel-7402 was assessed by detecting the proliferation activity, cell cycle distribution, expression changes of p21/CDKN1A, P27/CDKN1B, total Akt and phosphoryted AKT. Microarray analysis was conducted to determine the miRNA expression profiles in baicalein-treated or untreated Bel-7402 cells and then validated by qRT-PCR in two HCC cell lines (Bel-7402 and Hep3B). The gain-of-function of miR-3127-5p was performed by detecting anti-proliferative effects after transfecting miRNA mimics in cells. Finally, the expression level of miR-3127-5p in different HCC cell lines was determined by qRT-PCR.

### RESULTS:

Baicalein was able to inhibit the proliferation of Bel-7402 cells by inducing cell cycle arrest at the S and G2/M phase via up-regulating the expression of p21/CDKN1A and P27/CDKN1B and suppressing the PI3K/Akt pathway. Baicalein could alter the miRNA expression profiles in Bel-7402 cells. Putative target genes for differentially expressed miRNAs could be enriched in terms of cell proliferation regulation, cell cycle arrest and were mainly involved in MAPK, PI3K-Akt, Wnt, Hippo and mTOR signaling pathways. MiR-3127-5p, one of up-regulated miRNAs, exhibits low expression level in several HCC cell lines and its overexpression could inhibit cell growth of Bel-7402 and Hep3B cell lines by inducing S phase arrest by up-regulating the expression of p21 and P27 and repressing the PI3K/Akt pathway.

### CONCLUSIONS:

Modulation of miRNA expression may be an important mechanism underlying the anti-hepatoma effects of baicalein.