

论著

# 耐药逆转剂对人乳腺癌细胞P-糖蛋白、EMMPRIN和MMP表达的影响

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摘要

目的 观察耐药逆转剂川芎嗪(tetramethylpyrazine, TMP)对人乳腺癌MCF7/Adr细胞P-糖蛋白(P-glycoprotein, P-gp)、基质金属蛋白酶诱导物(extracellular matrix metalloproteinase inducer, EMMPRIN)和基质金属蛋白酶2(matrix metalloproteinases 2, MMP2)、MMP9表达的影响。方法 采用四甲基偶氮唑盐(MTT)比色法检测药物对MCF7/Adr细胞的毒性作用; 荧光分光光度法测定细胞内阿霉素(adriamycin, ADM)的荧光强度; Realtime RT-PCR和Western blot检测细胞P-gp、EMMPRIN、MMP2和MMP9 mRNA和蛋白水平的变化。结果 TMP与ADM联合作用于细胞, 与单用ADM相比, ADM对细胞的杀伤效应及细胞内ADM的荧光强度明显升高(P<0.05), 且有浓度依赖性; 与对照组相比, ADM能上调细胞P-gp、EMMPRIN和MMP2、MMP9蛋白表达; TMP能抑制ADM对细胞P-gp、EMMPRIN、MMP2和MMP9蛋白和mRNA水平的上调作用。结论 TMP在有效逆转肿瘤多药耐药的同时, 还能抑制ADM对P-糖蛋白、EMMPRIN、MMP2和MMP9的上调。

关键词 [多药耐药](#); [逆转](#); [川芎嗪](#); [P-糖蛋白](#); [EMMPRIN](#); [MMP](#)

分类号

## Effects of multidrug resistance reversing agent on P-glycoprotein, EMMPRIN and MMP expression in human breast cancer cells

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Abstract

Objective To investigate the effects of multidrug resistance (MDR) reversing agent tetramethylpyrazine (TMP) on P-glycoprotein(P-gp), EMMPRIN, MMP2 and MMP9 expression in human breast cancer cells. Methods The toxicity of the drugs to MCF7/Adr cells was assessed by MTT colorimetric assay; The fluorescence intensity of adriamycin (ADM) in MCF7/Adr cells was detected with fluorescence spectrophotometer; Expression of P-gp, EMMPRIN, MMP2 and MMP9 was detected by Western blotting analysis and reverse transcription and quantitative real-time polymerase chain reaction (Realtime RT-PCR). Results The combination of TMP and ADM enhanced the cytotoxicity of ADM and elevated the fluorescence intensity of ADM in MCF7/Adr cells as compared with the ADM group (P<0.05), and these effects were dose-dependent; Compared with the control group, P-gp, EMMPRIN, MMP2 and MMP9 were up-regulated by ADM at expression level and the up-regulation was inhibited by TMP at both Mrna and protein levels.

Conclusions TMP not only reversed MDR effectively, but also inhibited the up-regulation of P-gp, EMMPRIN, MMP2 and MMP9 by ADM.

Key words [multidrug resistance\(MDR\)](#) [reversal](#) [tetramethylpyrazine \(TMP\)](#) [P-glycoprotein](#) [EMMPRIN](#) [MMP](#)

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