

基础研究

低剂量电离辐射诱导小鼠睾丸中细胞色素 c和caspase-3表达的变化

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摘要:

目的: 研究低剂量电离辐射诱导小鼠睾丸中细胞色素c (Cyt c) 和caspase-3表达的变化, 阐明二者对低剂量电离辐射诱导小鼠睾丸细胞凋亡的作用。方法: 实验小鼠分为不同剂量(0、0.050、0.075、0.100和0.200 Gy)组与不同时间(0、6、12和24 h)组。采用实时PCR和Western blotting分别检测不同剂量X射线照射后不同时间小鼠睾丸组织中细胞色素c (Cyt c) 和caspase-3 mRNA和蛋白表达的变化。结果: 实时PCR结果显示, 不同剂量X射线照射后12 h, Cyt c和caspase-3 mRNA表达随剂量增加而增加, Cyt c mRNA在0.100 Gy照射时表达最多, 而caspase-3则在0.075 Gy照射时表达最多; 在0.075 Gy照射时二者蛋白表达最多。0.075 Gy 照射后Cyt c和caspase-3 mRNA表达随着时间延长表达增多, 24 h时达到最高; 二者蛋白表达在12 h时最高。结论: 低剂量电离辐射能够诱导小鼠睾丸生精细胞中Cyt c和caspase-3 mRNA和蛋白表达的增加, 并且具有剂量和时间规律性。

关键词: 细胞色素c; caspase-3; 实时PCR; 电离辐射; 生精细胞; 小鼠

Changes of Cyt c and caspase-3 expressions in mouse testis induced by low dose irradiation

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Abstract:

Abstract: Objective To investigate the effect of low dose irradiation on the expression changes of Cyt c and caspase-3 in mouse testis, and interpret the effects on apoptosis in mouse testis induced by irradiation. Methods The mice were divided into different doses (0, 0.050, 0.075, 0.100 and 0.200 Gy) groups and different time course (0, 6, 12 and 24 h) groups. The expressions of Cyt c and caspase-3 mRNA and proteins in mouse testis tissues irradiated with different doses X-rays were observed by real time PCR and Western blotting. Results The real time PCR results indicated that the expressions of Cyt c and caspase-3 mRNA were increased with the dose increasing 12 h after irradiation with different doses of X-rays, and the expression of Cyt c mRNA reached the peak after irradiated with 0.100 Gy, but the expression of caspase-3 mRNA expression reached the peak after irradiated with 0.075 Gy; the expression levels of Cyt c and caspase-3 protein were the highest when irradiated with 0.075 Gy X-rays. The expressions of Cyt c and caspase-3 mRNA after irradiation with 0.075 Gy X-rays were increased with the time prolongation, and reached the peak after 24 h, but the Cyt c and caspase-3 proteins expressed the most 12 h after irradiation with 0.075 Gy X-rays. Conclusion The mRNA and protein expressions of Cyt c and caspase-3 in mouse testis spermatogenic cells can be increased by low dose irradiation with dose- and time-effect regularity.

Keywords: Cyt c; caspase-3; real time PCR; irradiation; spermatogenic cell; mice

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