

小肠 RNA 对受照小鼠肠组织基因表达谱的影响

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用基因芯片技术研究小肠核糖核酸(Ribonucleic acid, RNA)对受照小鼠肠组织基因谱的改变^[1]。将12只小鼠随机分为照射组和小肠RNA组,用 γ 线照射小鼠,剂量率为138.82 cGy/min,总剂量为1150 cGy。小肠RNA组于照后即刻给予小肠RNA(100 μ g/mL, 0.4 mL/只);照射后第18 h 活杀小鼠,取空肠,提取RNA,经反转录后用Cy3和Cy5荧光标记,获得两组cDNA探针,与基因表达谱芯片进行杂交,结果由扫描仪扫描并用软件进行分析统计。小肠RNA组与照射组相比,有47条基因表达发生了明显变化,其中,有13条基因表达水平明显升高,而34条基因表达量明显下降,其它的基因则无显著性变化;在表达异常的基因中,有20条基因是已知功能或部分功能的基因^[2],其余27条则为未知功能的基因。初步结论为小肠RNA可改变受照小鼠肠组织基因表达谱,且下调基因数居多。

关键词 小肠核糖核酸, 电离辐射, 基因芯片, 基因, 小鼠

中图分类号 R818.2

参考文献

- 1 Schena M, Shalon D, Davis R M, *et al.* Science, 1995, 270(5235): 467-470
- 2 Ganheim C, Hoglund J, Waller K P. Acta Vet Scand, 2004, 45(1-2): 79-86

The effect of small intestine RNA on gene expression of intestines of irradiated mice

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In this paper, we intended to further investigate the effects of small intestine (Ribonucleic acid, RNA), on gene expression of intestines of irradiated mice. This will provide theoretical bases for repair of γ -ray caused damage in small intestine. Twelve BALB/c mice were randomly divided into two groups, one for irradiated control and the other for small intestine RNA therapy (100 μ g/mL, 0.4 mL). Eighteen hours after γ -ray irradiation with a dose rate of 138.82 cGy/min and a total dose of 1150 cGy, the mice were killed and their jejunum were taken out. Fluorescent cDNA probes labeled with Cy3 and Cy5 were prepared from RNA extracted from the intestines of the two groups. The probes of the two groups were hybridized against cDNA gene chip, the fluorescent signals were scanned with a scanner and the results were analyzed by a computer codes.

Compared with the control group, 47 genes changed in gene expression profile. The expression levels of 13 genes were up-regulated distinctly, while 34 genes were down-regulated significantly. Among the 47 genes, 20 were reported with known or inferred functions, i.e. 8 up-regulated genes (arginase 1, LPS-binding protein, rpS17, IL-18, beta-1-globin, small proline-rich protein 2A, pancreatitis-associated protein, and haptoglobin gene) and 12 down-regulated genes (component 2, integral membrane protein 2, ATP synthase alpha subunit, Man-6-phosphate receptor, IMP dehydrogenase, Gk-rs1, WW-domain binding protein1, ubiquitin fusion degradation1, α 1-actin, natural killer cell protein group 2, UDP-glucose dehydrogenase, and EMK2 gene). The other 27 were reported with unknown functions.

In conclusions, small intestine RNA could change specific expressions of some genes in mouse small intestines and most of these genes were down-regulated ones.

KEYWORDS Small intestine RNA, Ionizing radiation, cDNA microarray technology, Gene, Mice

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