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论著

丙烯酰胺诱导人白血病HL-60和NB_4细胞*hprt*基因的分子突变谱

刘胜学[1]，曹 佳[1*]，杨梦甦[2]，方志俊[2]，安 辉[1]

（1. 第三军医大学分子毒理学实验室, 重庆 400038; 2. 香港城市大学生物化学系, 九龙塘83，香港）

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摘要 为了研究丙烯酰胺的遗传毒理作用，采用单细胞克隆培养，双向筛选计数，多重PCR扩增与电泳分析，研究了诱导HL-60和NB_4两种细胞*hprt*基因突变率及分子突变谱. 发现只有丙烯酰胺高剂量组（700 mg·L^{-1}）才对两种细胞有明确的致*hprt*基因突变作用；丙烯酰胺诱发突变主要由点突变和缺失两部分组成（40.0%～66.7%，33.3%～60.0%），而自发突变几乎全是点突变（90.0%以上），两种细胞均无全基因缺失型；缺失突变可以发生于*hprt*基因上的每个外显子（除外显子7/8以外），较集中于基因的3′末端，且诱发突变中绝大多数是点突变与单个外显子缺失（93.3%，86.1%），两种细胞情况类似. 结果提示，丙烯酰胺具有较弱的诱导*hprt*基因突变的作用，且诱发突变与自发突变的分子图谱不一样，这可能与其作用机理有关.

关键词 基因, hprt 丙烯酰胺 诱变 细胞, HL-60 细胞, NB4

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Molecular spectra of acrylamide-induced mutation at *hprt* locus in human promyelocytic leukemia HL-60 and NB_4 cell lines

LIU Sheng-Xue[1], CAO Jia[1*], Michael M YANG[2], FONG Chi-Chun[2], AN Hui[1]

(1. Department of Molecular Toxicology, the Third Military Medical University, Chongqing 400038, China; 2. Department of Biology and Chemistry, City University of Hong Kong, Kowloon 83, Hong Kong, China)

Abstract

The genotoxicity of acrylamide was investigated by methods of single cell clone culturing, two-way screening count, multiplex PCR amplification and electrophoresis technique. Acrylamide only showed clear mutagenesis until dose 700 mg·L^{-1} in HL-60 cells. The most frequent spontaneous mutation was point mutation(≥90.0%) and acrylamide- induced mutation mainly included partial deletion and point mutation(respectively 40.0%－66.7%, 33.3%－60.0%). Total gene deletion was not discovered in both of cells. There was deletion mutation in all exons of *hprt* gene(except 7/8 exon), and toward the 3′ end of the *hprt* gene. The most frequent acrylamide- induced mutations were point mutation and single exon deletion(93.3%, 86.1%). There was no clear difference in both of cells. The results suggest that the spectra of spontaneous and acrylamide-induced mutants are different, and the smaller changes in genetic structure have something to do with mechanism.

Key words genes hprt acrylamide mutagenesis cell HL-60 cell NB4

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通讯作者 曹 佳 caoqq@yahoo.com