

论著

彗星分析技术检测辐射和化学物质诱导的DNA损伤

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摘要 目的: 用彗星分析技术(comet assay)检测邻苯二胺(o-phenylenediamine, o-PDA)和60 Co γ -射线对CHL细胞DNA的损伤。方法: CHL细胞经0、2、4、6、8 $\mu\text{mol/L}$ 的邻苯二胺染毒和0、2、4、6、8、10、15 Gy的60 Co γ -射线照射后, 进行单细胞凝胶电泳, 测定彗星尾长。采用Origin 4.2软件建立两种诱变剂的剂量与CHL细胞彗星尾长的剂效关系。结果: DNA的损伤程度(以彗星尾长为指标)随60 Co γ -射线剂量的加大和o-PDA浓度的增加而增强, CHL细胞彗星尾长(TL)与60 Co γ -射线的剂效关系符合线性平方模型: $TL=20.41+2.42D+0.38D^2$; 与o-PDA浓度的剂效关系符合线性平方模型: $TL=1.90+1.46C+0.52C^2$ 。结论: 60 Co γ -射线剂量和o-PDA的浓度与细胞DNA损伤程度具有剂效关系; 彗星分析是一种分析环境危害因子遗传毒性的有效技术。

关键词 [彗星分析](#); [邻苯二胺](#); [60 Co \$\gamma\$ -射线](#); [DNA损伤](#)

MEASUREMENT OF DNA DAMAGES INDUCED BY RADIATION AND CHEMICALS USING COMET ASSAY

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Abstract Purpose: To study DNA damages induced by 60 Co γ -radiation and o-phenylenediamine(o-PDA) using comet assay. Methods: The DNA damages induced by 0,2,4,6,8,10,15 Gy 60 Co γ -rays and 0,2,4,6,8 $\mu\text{mol/L}$ o-PDA were measured using comet assay. The dose-respose relationship of the CHL cell tail length and the dose of the two type of mutagen were established with Origin 4 software. Results: The tail length of comet, index of DNA damage in this experiment, increased with the dose of 60 Co γ -ray and concentration of o-PDA, respectively. The dose-respose relationship of the CHL cell tail length(TL)and the dose of 60 Co γ -ray fitted for linear-quadratic model: $TL=20.41+2.42D+0.38D^2$; The dose-response relationships for DNA damage induced by o-PDA fitted for linear-quadratic model: $TL=1.90+1.46C+0.52C^2$. Conclusion: The comet assay is a useful tool for determining the genotoxicity of environmental agents.

Keywords [comet assay](#) [o-phenylenediamine](#) [60 Co \$\gamma\$ -rays](#) [DNA damages](#)

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