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论著

源水和氯化饮用水中有机提取物对HepG2细胞DNA损伤的诱导作用及对gadd153基因表达的影响

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摘要 背景与目的： 研究源水和氯化饮用水有机提取物对DNA的损伤作用以及对gadd153启动子和mRNA表达的影响。 材料与方法： 应用彗星试验检测源水和氯化饮用水有机提取物对HepG2细胞的DNA损伤作用；构建含有gadd153启动子和荧光素酶报告基因的载体pGADD153-Luc，以检测荧光素酶活性(发光检测荧光素酶活性)反映gadd153启动子的活性，RT-PCR检测gadd153基因mRNA的表达。 结果： 彗星试验显示在10、100 ml/ml培养基剂量组源水和氯化饮用水有机提取物处理24 h后，OTM(Olive 尾距)显著高于对照组(P<0.01)，并有良好的剂量反应关系(源水r=0.882，P<0.05；氯化饮用水r=0.940，P<0.05)；氯化饮用水中有机提取物诱导OTM显著高于源水(P<0.05)；荧光素酶表达在源水和氯化饮用水有机提取物各剂量组均显著高于对照组(P<0.01)并有良好的剂量反应关系(源水r=0.814, P<0.05; 氯化饮用水r=0.921, P<0.05)；相关分析表明荧光素酶活性与OTM呈正相关(源水r=0.980，P<0.01；氯化饮用水r=0.995，P<0.01)；RT-PCR结果显示在100 ml/ml培养基剂量组，源水和氯化饮用水中有机提取物诱导gadd153mRNA表达显著增加(P<0.05)，并与OTM有良好的相关性(源水r=0.864，P<0.05；氯化饮用水r=0.897，P<0.05)。 结论： 源水和氯化饮用水有机提取物可诱导HepG2细胞DNA损伤，导致gadd153启动子区的激活，并进一步调控下游gadd153基因mRNA的表达。

关键词 源水和氯化饮用水有机提取物； DNA损伤； gadd153启动子； gadd153基因； 荧光素酶报告基因

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本刊中 包含“源水和氯化饮用水有机提取物； DNA损伤； gadd153启动子； gadd153基因； 荧光素酶报告基因”的 相关文章
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Effects of Organic Compounds From Untreated and Chlorinated Drinking Water on DNA Damage and Expression of gadd153 Gene in HepG2 Cell Line

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Abstract BACKGROUND & AIM： To investigate the effects of the untreated water and chlorinated drinking water extracts of the Han River on DNA damage and the expression of the gadd153 promoter and mRNA. MATERIAL AND METHODS： The DNA damage was assessed by the alkaline comet assay. The plasmid(pGADD153-Luc)containing DNA damage and repair inducible gene 153 (gadd153) promoter and luciferase reporter gene were constructed. The activity of gadd153 promoter was represented by the luciferase activity, and the inducible luciferase activity was detected by bioluminescence. The expression of gadd153 mRNA was detected by RT-PCR. RESULTS： The Olive Tail Moment(OTM) induced by the untreated water and chlorinated drinking water extracts was increased at the dose of 10, 100ml/ml medium (P<0.01), compared with control. There was a good dose-response relationship (r=0.882, P<0.05; r=0.940, P<0.05); The OTM induced by the chlorinated drinking water extracts was higher than that of untreated water (P<0.05). The luciferase activity was significantly increased in each treatment group at each dose (P<0.01) and there were a good dose-response relationship (r=0.814, P<0.05; r=0.921, P<0.05). There were positive correlations between the OTM and the luciferase activities (r=0.980, P<0.01, r=0.995, P<0.01); The high expression of gadd153 mRNA was induced by the water extracts at dose of 100 ml/ml medium (P<0.05). There werepositive correlation between the OTM and the expressions of

gadd153 mRNA (r=0.864, P<0.05; r=0.897, P<0.05). CONCLUSION： The untreated water and chlorinated drinking water extracts of Han River could induce DNA damage and further activated the gadd153 promoter which regulated the expression of gadd153 mRNA.

Keywords untreated water and chlorinated drinking water extracts DNA damage gadd153 promoter gadd153 luciferase reporter gene

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