

研究报告

## 硝酸镧在小鼠肝中的积累及遗传毒理研究

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### 摘要

通过在饮水中加入硝酸镧使小鼠摄入稀土, 1个月采用ICP-MS法测试了镧在小鼠肝中的积累, 研究了硝酸镧对骨髓细胞微核率的影响, 并采用体外试验研究了硝酸镧对小鼠基因组DNA的切割作用, 探讨了稀土元素镧的遗传毒理. 结果表明, 1 000、500、300和50  $\mu\text{g}\cdot\text{ml}^{-1}$ 处理组小鼠肝中镧含量分别达1.46、0.558、0.529和0.083  $\mu\text{g}\cdot\text{g}^{-1}$ , 与对照组0.028  $\mu\text{g}\cdot\text{g}^{-1}$ 的含量相比, 各处理组小鼠肝中镧的含量皆有升高且与喂饮硝酸镧溶液的浓度成正比 ( $r=0.980$ ). 1 000、500和300  $\mu\text{g}\cdot\text{ml}^{-1}$ 处理组微核率与对照组之间的  $t$ 检验结果表明各组微核率显著上升 ( $P<0.05$ ), 且亦与喂饮硝酸镧溶液的浓度成正比 ( $r=0.853$ ). 体外试验显示, 硝酸镧可切断DNA链, 说明稀土元素镧可在生物体内积累, 其在细胞内可使DNA断裂而导致遗传物质受损.

关键词 [硝酸镧; ICP-MS; 微核率; DNA断裂; 遗传毒理](#)

分类号

## Accumulation of $\text{La}(\text{NO}_3)_3$ in mice liver and its genetic toxicity

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### Abstract

By using ICP-MS method, this paper determined the accumulation of La in mice liver after the mice being fed with  $\text{La}(\text{NO}_3)_3$  water solution for thirty days, and through *in vitro* experiment, studied the effect of  $\text{La}(\text{NO}_3)_3$  on the micronucleus rate of mice bone marrow cells and the cleavage action of  $\text{La}(\text{NO}_3)_3$  on genome DNA to investigate the genetic toxicity of La. The results showed that when the treated concentration was 1 000, 500, 300 and 50  $\mu\text{g}\cdot\text{ml}^{-1}$ , the amount of La in mice liver reached 1.46, 0.558, 0.529 and 0.083  $\mu\text{g}\cdot\text{g}^{-1}$ , respectively. Compared with control, the La amount in disposed groups' mice livers increased with increasing  $\text{La}(\text{NO}_3)_3$  concentration in water ( $r=0.980$ ). T-test results showed that there existed significant differences in 1 000, 500 and 300  $\mu\text{g}\cdot\text{ml}^{-1}$  disposed groups when compared with the control ( $P<0.05$ ). The micronucleus rate of mice bone marrow cells increased with increasing  $\text{La}(\text{NO}_3)_3$  concentration in water ( $r=0.853$ ). The *in vitro* experiments showed that  $\text{La}(\text{NO}_3)_3$  could make DNA cleaved. It could be concluded that that La might be accumulated in organisms, and could induce the damage of genetic material in cells.

**Key words** [La\(NO<sub>3</sub>\)<sub>3</sub>](#) [ICP-MS](#) [Micronucleus rate](#) [DNA cleavage](#) [Genetic toxicity](#)

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