

论著

## StAR蛋白表达及线粒体超微结构改变在锰抑制雄性大鼠睾酮合成中的作用

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**摘要** 目的 研究锰对雄性大鼠睾酮合成的影响及其可能机制。方法 雄性成年SD大鼠用MnCl<sub>2</sub> 7.5, 15和30 mg·kg<sup>-1</sup>·d<sup>-1</sup> ip 40 d, 用放射免疫测定法测定血清睾酮含量, 电镜观察大鼠睾丸间质Leydig细胞超微结构改变及应用Western印迹法测定甾类激素合成急性调节蛋白(StAR)在分离的大鼠睾丸间质Leydig细胞线粒体中的水平, 并测定了睾丸和附睾的脏器系数。结果 与正常对照组相比, MnCl<sub>2</sub>染毒组雄性SD大鼠血清睾酮含量、StAR蛋白表达均明显下降, 大鼠睾丸间质Leydig细胞胞内线粒体变形、肿胀、空泡化。30 mg·kg<sup>-1</sup>组大鼠睾丸脏器系数也明显下降。结论 MnCl<sub>2</sub>可以降低雄性大鼠的睾酮合成, 其机制与睾丸间质Leydig细胞StAR蛋白表达的下降有关, 锰所致线粒体功能的损害也可能是StAR蛋白表达下降的原因之一。

**关键词** [氯化锰](#) [细胞](#), [Leydig](#) [睾酮](#) [甾类激素合成急性调节蛋白](#)

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## The contributing effect of steroidogenic acute regulatory protein expression and the ultrastructural alterations of mitochondria in manganese reduced testosterone synthesis

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### Abstract

**AIM** To study the effect of manganese on testosterone synthesis and to explore its mechanism. **METHODS** After treatment of manganese at doses 7.5, 15 and 30 mg·kg<sup>-1</sup>·d<sup>-1</sup> ip for 40 d, the serum testosterone concentration was measured by radioimmunoassay(RIA), ultrastructural alterations of the rat Leydig cells were examined with the electron microscope and the expression of steroidogenic acute regulatory(StAR) protein in the mitochondria of purified rat Leydig cells was tested using Western blot assay. The organ index of testes and epididymis was also tested. **RESULTS** Compared with the control group, the serum testosterone concentration and the expression of StAR were both decreased significantly in the male rats exposed to manganese. Deformation, swelling and vacuolation of mitochondrion were also observed in the rat Leydig cells. The organ indexes of testes of the rats in the 30 mg·kg<sup>-1</sup> group were also decreased significantly. **CONCLUSION** MnCl<sub>2</sub> could decrease the synthesis of testosterone in male rats by disrupting StAR protein expression in Leydig cells, the manganese induced mitochondrial dysfunction might contribute to it.

**Key words** [manganese chloride](#) [cells](#) [Leydig](#) [testosterone](#) [steroidogenic acute regulatory protein](#)

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