

### 论文

## 高效液相色谱-电喷雾质谱法研究人尿中 $\alpha$ -生育酚的主要代谢产物

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#### 摘要:

研究 $\alpha$ -生育酚在人尿中的主要代谢物。选择健康受试者5名连续7 d单剂量口服维生素E 250 mg, d 7收集0~6 h尿样,经C<sub>18</sub>小柱固相萃取(SPE)分离纯化后,直接采用液相色谱-质谱联用方法(LC-MS<sup>D</sup>)对尿样进行测定。在尿样中鉴定出4个主要代谢物,它们分别为 $\alpha$ -生育酸、2,5,7,8-四甲基-2-(2'-羧乙基)-6-硫酸酯苯并二氢吡喃、 $\gamma$ -生育酸内酯和2,5,7,8-四甲基-2-(4',8',12'-三甲基-12'-羧十二烷基)-6-硫酸酯苯并二氢吡喃。该方法灵敏、选择性高,为深入研究 $\alpha$ -生育酚在人体内的代谢规律提供了可靠的方法。

关键词: 高效液相色谱-串联质谱 固相萃取  $\alpha$ -生育酚 代谢产物

### Analysis of primary metabolites of $\alpha$ -tocopherol in human urine by liquid chromatography-mass spectrometry

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#### Abstract:

To investigate primary metabolites of  $\alpha$ -tocopherol in human urine, the urine samples of five healthy volunteers after oral administration of 250 mg vitamin E once a day for seven days were collected within 0-6 h in the seventh day. The samples were purified through C<sub>18</sub> solid-phase extraction cartridge and analyzed by liquid chromatography-tandem mass spectrometry.  $\alpha$ -Tocopheronic acid, 2,5,7,8-tetramethyl-2-(2'-carboxyethyl)-6-suphate-chroman ( $\alpha$ -CEHC-sulphate),  $\gamma$ -tocopheronolactone, and 2,5,7,8-tetramethyl-2-(4',8',12'-trimethyl-12'-carboxy dodecanyl)-6-suphate-chroman were found in urine of volunteers as four primary metabolites of  $\alpha$ -tocopherol. The method has shown to be promising for  $\alpha$ -tocopherol detection with many desirable properties including high sensitivity and selectivity, thus providing a reliable pathway for further study in metabolism of  $\alpha$ -tocopherol.

Keywords: solid-phase extraction  $\alpha$ -tocopherol metabolite liquid chromatography-mass spectrometry

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