

论著

## 干姜对大鼠尿液内源性代谢物的影响

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**摘要** 目的 通过基于液质联用的代谢组学方法, 探讨干姜对大鼠尿液内源性物质的影响。方法 20只SD大鼠分为正常对照组和干姜组, 干姜组ig给予干姜水提物 $0.72 \text{ g} \cdot \text{kg}^{-1}$ , 每天1次, 连续30 d, 分别于第0, 1, 8, 15, 22, 29天收集大鼠尿样。经液相色谱分离, 三重四极杆质谱对尿液中内源性代谢物进行全扫描分析, 采用主成分分析(PCA)法降维, 正交信号校正和偏最小二乘法判别分析法(OSC-PLS-DA)分析采集的质荷比和丰度值数据, 测定大鼠体内内源性物质含量。结果 质荷比和丰度值数据均值主成分分析结果显示, 第8天干姜对大鼠尿液中物质代谢影响最大。对第8天数据进行OSC-PLS-DA分析, 与正常对照组相比, 干姜组大鼠尿液中磷脂酸和神经酰胺-1-磷酸等物质含量显著下降, 孕烯醇酮硫酸和鞘磷脂物质含量明显上升。结论 干姜对正常大鼠机体代谢有明显的影

响, 神经酰胺-1-磷酸等10种物质被判定为可能生物标志物。

**关键词** [干姜](#) [液相色谱](#) [质谱法](#) [代谢组学](#)

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## Effect of Rhizoma Zingiberis on endogenous metabolites in urines of rats: a metabonomic study

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### Abstract

**OBJECTIVE** To explore the effect of Rhizoma Zingiberis on endogenous metabolites in test urines of rats by metabonomics based on high performance liquid chromatography-mass spectrometry. **METHODS** Twenty Sprague-Dawley(SD) rats were randomly divided into Rhizoma Zingiberis group that was given  $0.72 \text{ g} \cdot \text{kg}^{-1}$ , ig, once a day, consecutively for 30 d and the normal control group (ig distilled water  $10 \text{ ml} \cdot \text{kg}^{-1}$ ). The urines of rats were collected 3 h after administration at d 0, 1, 8, 15, 22 and d 29. Using liquid chromatography mass spectrometry to analyze the endogenous compounds in urines of rats, after data matching, the means of data in the two groups was performed by principal component analysis (PCA) to observe time trajectory of endogenous compound change in urines of rats, and then processed by orthogonal signal correction-partial least square discriminate analysis (OSC-PLS-DA) to determine biomarkers in the urines of rats. **RESULTS** The time trajectory analysis of endogenous compound change in urines of rats demonstrated that at d 8 the distance between the means of data in the two groups was the maximum. Compared with normal control group, concentrations of ceramide 1-phosphate significantly decreased. However, some other endogenous metabolites such as pregnenolone sulfate in urines of rats in test group increased apparently. **CONCLUSION** Rhizoma Zingiberis can apparently change endogenous metabolites in SD rats. Compounds including ceramide 1-phosphate and pregnenolone sulfate are regarded as possible biomarkers.

**Key words** [Rhizoma Zingiberis](#) [gas chromatography](#) [mass spectrometry](#) [metabonomics](#)

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