

·基础与临床研究·

应用代谢组学法分析 3 种常用口腔材料对细胞内小分子蛋白的影响

颜 雯¹ 周京琳² 李 伟²

(1. 德阳市人民医院口腔科, 德阳 618000;

2. 四川大学口腔疾病研究国家重点实验室, 成都 610041)

【摘要】目的 采用一氢核磁共振(¹H-NMR)的代谢组学方法, 分析 3 种常用口腔材料对细胞的胞内小分子蛋白质谱的影响, 探讨代谢组学方法在评价材料生物相容性方面的潜在应用前景。**方法** 将小鼠成纤维细胞分别与羟基磷灰石-磷酸三钙生物陶瓷、钛合金、聚甲基丙烯酸甲酯(自凝塑料)3 种常用口腔材料进行体外培养, 并设单独细胞培养作为空白对照。培养 72 h 后提取细胞内蛋白质, 利用核磁共振技术检测细胞内蛋白变化谱, 经数据处理和偏最小二乘法判别分析(PLS-DA), 比较各组间小分子蛋白质谱的变化情况, 观察各组间小分子蛋白质谱的差异。**结果** 3 组材料引起的细胞内小分子蛋白质谱明显不同, 均有各自聚集趋势, 分布区域间有较大的分隔区, 且区分明显。**结论** 代谢组学分析细胞内小分子蛋白质谱可能是一种在分子水平上研究口腔材料生物相容性机制以及评价的有效方法。

【关键词】 代谢组学 小分子蛋白质 羟基磷灰石-磷酸三钙生物陶瓷 钛合金 甲基丙烯酸甲酯 生物相容性

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Effects of three dental biomaterials on intracellular protein variation by metabolomics method

Yan Wen¹ Zhou Jinglin² Li Wei²

(1. Stomatology Department of Deyang People's Hospital, Deyang 618000;

2. State Key Laboratory of Oral Diseases, West China Hospital of Stomatology, Sichuan University, Chengdu 610041)

【Abstract】Objective The aim of this study was to investigate the application of ¹H-NMR-based metabolomics in research of biocompatibility of dental materials by detecting the differences of the intracellular small molecular proteins and explore the role of metabolomic method in discriminating biocompatibility of dental materials. **Methods** L-929 fibroblasts were cultured with hydroxyapatite-tricalcium phosphate bioceramics, titanium alloy, methyl methacrylate respectively *in vitro*, and the blank control group was established at the same time. The ¹H-nuclear magnetic resonance (NMR) spectra were obtained to detect the intracellular protein change in each cell group after 72 h. The obtained data were processed by supervised partial least squares discriminant analysis(PLS-DA) to find out the differences among the four groups. **Results** There were significant differences in the ¹H-NMR spectrograms among the four groups. The results of pattern recognition presented clearly clustering between the four groups. PLS-DA analysis demonstrated the good effect in differentiating these samples.

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通信作者: 李伟, Email: 627296734@qq.com