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论文

恐惧记忆相关蛋白的蛋白质组学研究

郑君芳, 刘华, 熊英, 王小柱, 贺俊崎

首都医科大学生物化学与分子生物学系, 北京 100069

摘要:

应用双向凝胶电泳结合质谱鉴定和数据库检索, 分析比较了CD1和C57BL/6J小鼠经条件性恐惧实验后海马蛋白表达的差异, 探讨了与恐惧记忆相关的蛋白质. CD1和C57BL/6J小鼠经条件性恐惧实验后, 海马蛋白表达存在明显差异, 29种蛋白(31个蛋白点)与恐惧记忆的形成显著相关. 其中24个蛋白点表达显著上调, 7个蛋白点显著下调. 与恐惧记忆相关的蛋白按功能可分为如下6类: (1) 能量代谢或线粒体功能相关蛋白; (2) 神经发育相关蛋白; (3) 信号转导相关蛋白; (4) 细胞骨架相关蛋白; (5) 氨基酸代谢和蛋白分解相关蛋白; (6) 伴侣蛋白. 这些恐惧记忆形成的相关蛋白深化了对恐惧记忆脑机制的认识, 为研究和治疗认知相关疾病提供了新靶标.

关键词: 条件性恐惧; 海马; 蛋白质组学; 质谱

Proteomic Analysis of Fear Memory Related Proteins in Mice

ZHENG Jun-Fang, LIU Hua, XIONG Ying, WANG Xiao-Zhu, HE Jun-Qi*

Department of Biochemistry and Molecular Biology, Capital Medical University, Beijing 100069, China

Abstract:

To investigate proteins related with fear and emotional memory, hippocampal proteins from CD1 and C57BL/6J mice after fear conditioning experiment were extracted and subjected to 2D gel electrophoresis. Protein quantification was analyzed and the differentially expressed spots were identified using mass spectrometry and MASCOT database searching. Hippocampal proteins from CD1 and C57BL/6J mice after fear conditioning experiment were significantly different. Twenty-nine proteins (Thirty-one spots) are closely related with fear memory formation. Expression levels of 7 spots downregulated significantly; expression levels of 24 spots increased significantly. These identified proteins could be devided into six categories according to their functions: (1) energy metabolism and mitochondrion function; (2) neurogenesis; (3) signal transduction; (4) cytoskeleton; (5) amino acid metabolism and protein degradation; (6) chaperone. These proteins improved insights into the fear mechanism and provided new targets for the study and treatment of cognitive diseases.

Keywords: Fear conditioning; Hippocampus; Proteomics; Mass spectrometry

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通讯作者: 贺俊崎, 男, 博士, 教授, 主要从事蛋白-蛋白相互作用及蛋白质组学研究. E-mail: jq_he@ccmu.edu.cn

作者简介:

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