

[1]陈懿,王晓波,张俊勇,等.超声微泡携MAGL-shRNA靶向释放对大鼠肝细胞肝癌转移作用的实验研究[J].第三军医大学学报,2013,35(16):1708-1712.

Chen Yi,Wang Xiaobo,Zhang Junyong,et al.Effect of ultrasound microbubble carrying MAGL-shRNA on metastasis of hepatocellular carcinoma in rats[J].J Third Mil Med Univ,2013,35(16):1708-1712.

[点击复制](#)

超声微泡携MAGL-shRNA靶向释放对大鼠肝细胞肝癌转移作用的实验研究(PDF)

分享到:

《第三军医大学学报》 [ISSN:1000-5404/CN:51-1095/R] 卷: 35 期数: 2013年第16期 页码: 1708-1712 栏目: 论著 出版日期: 2013-08-30

Title: Effect of ultrasound microbubble carrying MAGL-shRNA on metastasis of hepatocellular carcinoma in rats

作者: [陈懿](#); [王晓波](#); [张俊勇](#); [连峥嵘](#); [龚建平](#)
重庆医科大学附属第二医院肝胆外科; 重庆市涪陵中心医院肝胆外科

Author(s): [Chen Yi](#); [Wang Xiaobo](#); [Zhang Junyong](#); [Lian Zhengrong](#); [Gong Jianping](#)
Department of Hepatobiliary Surgery, Second Affiliated Hospital, Chongqing Medical University, Chongqing, 400010; Department of Hepatobiliary Surgery, Central Hospital of Fuling District, Chongqing, 408000, China

关键词: [肝细胞肝癌](#); [单酰基甘油脂肪酶](#); [超声微泡](#); [转移](#)

Keywords: [hepatocellular carcinoma](#); [monoacylglycerol lipase](#); [ultrasound microbubble](#); [metastasis](#)

分类号: R454.3;R73-362;R735.7

文献标志码: A

摘要: 目的 观察超声微泡携单酰基甘油脂肪酶沉默基因(monoacylglycerol lipase short hairpin RNA, MAGL-shRNA)在大鼠肝细胞肝癌(hepatocellular carcinoma, HCC)组织中转染及对HCC转移的作用。 方法 建立大鼠肝细胞肝癌模型,病理解剖和二维超声验证肝脏成瘤情况。40只SD大鼠完全随机分成4组,分别为PBS液组、MAGL-shRNA质粒微泡组(MAGL-shRNA+microbubble, MB)、空白质粒微泡+超声辐照组(microbubbles+ultrasound, MB+US)、MAGL-shRNA质粒微泡+超声辐照组(MAGL-shRNA+MB+US)。每只注射1 mL,对MB+US组和MAGL-shRNA+MB+US组大鼠肝区同时给予超声辐照,辐照

导航/NAVIGATE

[本期目录/Table of Contents](#)

[下一篇/Next Article](#)

[上一篇/Previous Article](#)

工具/TOOLS

[引用本文的文章/References](#)

[下载 PDF/Download PDF\(1615KB\)](#)

[立即打印本文/Print Now](#)

[查看/发表评论/Comments](#)

[导出](#)

统计/STATISTICS

[摘要浏览/Viewed](#) 187

[全文下载/Downloads](#) 95

[评论/Comments](#)

[RSS](#) [XML](#)

条件为300 kHz, 2 W/cm², 辐照10 s, 间隔10 s, 共20 min。Western blot检测大鼠HCC组织MAGL蛋白的表达, 免疫组化检测MAGL和基质金属蛋白酶2(matrix metalloproteinase-2, MMP-2)的表达。比较各组动物的肿瘤转移情况。 结果 MAGL在HCC组织中表达明显高于正常肝组织($P<0.05$); 微泡携MAGL-shRNA可以在HCC组织被超声辐照击破后靶向释放, 在各组HCC组织中均有MAGL蛋白的表达, 其中MAGL-shRNA+MB+US组表达量明显低于其他组($P<0.01$); 免疫组化检测MAGL-shRNA+MB+US组MMP-2表达均低于其他组($P<0.01$); 各组动物均见肿瘤转移, 但MAGL-shRNA+MB+US组转移率最低($P<0.05$)。 结论 超声辐照可破坏携MAGL-shRNA的微泡使之靶向释放并增强了MAGL-shRNA的转染效率, MAGL-MMP-2通路可能与HCC的转移相关。

Abstract: Objective To determine the effect of silencing monoacylglycerol lipase by short hairpin RNA (shRNA) on the metastasis of hepatocellular carcinoma in rats by using ultrasound-targeted microbubble destruction. Methods Liver tumor models of rats were established by intragastrically injection of 0.2% DEN in 5 times per week for 14 weeks. The successful establishment of tumor model was testified by pathologic biopsy and two-dimensional ultrasonography. Totally 40 rats with liver tumor were randomly divided into 4 groups, phosphate-buffered solution (PBS) group, lipid microbubbles loaded MAGL-shRNA (MAGL-shRNA+microbubble group), pure lipid microbubbles+ultrasound (MB+US group), and lipid microbubbles loaded MAGL-shRNA+ultrasound (MAGL-shRNA+MB+US group). The microbubbles of 1 mL containing MAGL-shRNA plasmid or not were injected through tail vein. Ultrasound radiation was applied on the rats of MB+US and MAGL-shRNA+MB+US groups after the injection of target gene, with the radiation frequency of 1 kHz, sound intensity of 2 W/cm², with the pulse irradiation of 10 s and interval time of 10 s for totally 20 min. The expression of MAGL protein was detected in the tumor mass by Western blotting. Protein expression of MAGL and matrix metalloproteinase-2 (MMP-2) was detected by immunohistochemistry (IHC). Tumor metastasis were observed and compared among different groups. Results The protein expression of MAGL was significantly higher in HCC