[1]谢光友,杨海涛,吕富荣,等.兔脂肪间充质干细胞的培养鉴定及体外磁标记MR成像[J].第三军医大学学报,2014,36(15):1567-1571.
Xie Guangyou,Yang Haitao,Lyu Furong,et al.Culture and identification of rabbit adipose-derived stem cells and its magnetic resonance imaging in vitro[J].J Third Mil Med Univ,2014,36(15):1567-1571.

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(1162KB)
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
全文下载/Downloads 92
评论/Comments 65

兔脂肪间充质干细胞的培养鉴定及体外磁标记MR成

《第三军医大学学报》[ISSN:1000-5404/CN:51-1095/R] 卷: 36 期数: 2014年第15期 页码: 1567-1571 栏目: 论著 出版日期: 2014-08-15

Title: Culture and identification of rabbit adipose-derived stem cells and its magnetic resonance imaging *in vitro*

作者: 谢光友; 杨海涛; 吕富荣; 鲁文力; 盛波; 肖智博; 吕发金; 欧阳羽
重庆医科大学附属第一医院放射科

Author(s): Xie Guangyou; Yang Haitao; Lyu Furong; Lu Wenli; Sheng Bo; Xiao Zhibo; Lyu Fajin; Ouyang Yu
Department of Radiology, First Affiliated Hospital, Chongqing Medical University, Chongqing, 400016, China

关键词: 脂肪间充质干细胞; 超顺磁性氧化铁; 磁标记; 磁共振成像; 体外

Keywords: adipose derived stem cells; superparamagnetic iron oxide particles; magnetically labeled; magnetic resonance; *in vitro*

分类号: R329.2; R392-33; R445.2

文献标志码: A

摘要: 目的 研究兔脂肪间充质干细胞（adipose derived stem cells，ADSCs）的培养鉴定方法，联合应用超顺磁性氧化铁（superparamagnetic iron oxide particles，SPIO）和多聚赖氨酸（poly-l-lysine，PLL）行体外磁标记细胞，探讨磁标记示踪的可行性。 方法 分离、纯化并培养兔ADSCs，流式细胞术鉴定细胞表面抗原CD90、CD44和CD34。应用SPIO-PLL标记细胞，普鲁士蓝染色和透射电镜检测胞内铁粒子。体外3.0T MR分别对1×10^7个未标记ADSCs（空白对照），经25、50、75μg/mL SPIO-PLL分别标记的1×10^7个细胞，经25 μg/mL SPIO-PLL标记的1×10^7个（标记1 d）、1×10^7个（标记3 d）和5×10^6个（标记1 d）ADSCs进行成像，包括T_1WI、T_2WI及T^*_2WI序列，测量各组的信号强度和弛豫时间。 结果 第3代ADSCs纯度高、排列规则，细胞呈漩涡状，流式细胞术检测结果示CD44和CD90阳性表达率分别为99.2%、98.7%，CD34表达阴性。普鲁士蓝染色和透射电镜示胞浆内蓝色颗粒，磁标记率近100%。MR示随着SPIO-PLL浓度增高，T^*_2WI和T_2WI序列的信号强度变化较T_1WI明显。1×10^7个ADSCs（标记1 d）的信号强度变化率较1×10^7个（标记3 d）和5×10^6个（标记1 d）大，T^*_2和T_2弛豫时间与T 1弛豫时间相比差异均有统计学意义（F=161.47，P<0.05），但T^*_2和T_2弛豫时间相比差异无统计学意义（F=5.88，P>0.05）。 结论 通过分离纯化培养可获得足量的ADSCs，SPIO-PLL能够有效标记ADSCs，体外可行MR细胞成像，以T^*_2WI和T_2WI序列敏感。

Abstract: Objective To investigate how to culture and identify rabbit adipose-derived stem cells (ADSCs), and to explore the feasibility of tracing ADSCs after being labeled by superparamagnetic iron oxide particles (SPIO) combined with poly-l-

更新日期/Last Update: 2014-07-25

lysine (PLL) *in vitro*. Methods ADSCs were isolated from New Zealand rabbit, and then purified and primarily cultured. Flow cytometry (FCM) was used to identify cell surface antigens CD44, CD90 and CD34. Transmission electron microscopy (TEM) was used to observe the intracellular iron particles in SPIO-PLL labeled ADSCs after Prussian blue staining. 3.0-T MR scanning *in vitro* system was used to scan 1×10^7 ADSCs unlabeled and labeled with 25, 50 and 75 μg/mL SPIO-PLL respectively, or labeled with 25 μg/mL for 1 or 3 d, or to scan 5×10^6 cells labeled with 25 μg/mL for 1 d. T_1WI, T_2WI and T^*_2WI arrays were performed for the signal intensity (SI) and relaxation time of each tube. Results The ADSCs of third generation were of high purity, in regular arrangement presenting whirlpool-like. The cells had an expression rate of 98.7% for CD44 and 99.2% for CD90, but negative expression for CD34. TEM showed that iron particles existed in the cytoplasm of ADSCs after Prussian blue staining, and the rate of labeling was nearly 100%. T^*_2WI and T_2WI demonstrated a more obvious decrease in SI than that of T_1WI with the increasing concentration of SPIO-PLL. The percentage of SI in 1×10^7 ADSCs (labeled for 1 d) was significantly higher than that of 1×10^7 (labeled for 3 d) and 5×10^6(labeled for 1 d). The relaxation time of $T^*_2$and T_2 compared with T_1 was significant different (F=161.47, P<0.05), but the relaxation time between T^*_2 and T_2 was not statistically significant (F=5.88, P>0.05). Conclusion Sufficient ADSCs are obtained through isolation, purification and culture. ADSCs are labeled effectively by SPIO-PLL and detected through MR scanning *in vitro*, with T^*_2WI and T_2WI arrays more sensitive.

参考文献/References:

谢光友, 杨海涛, 吕富荣, 等. 兔脂肪间充质干细胞的培养鉴定及体外磁标记MR成像[J].第三军医大学学报,2014,36(15):1567-1571.

相似文献/References:

[1]廖翠薇,邹利光,卫静,等.实验性肝细胞癌SPIO增强MRI及其病理学对照研究[J].第三军医大学学报,2006,28(01):38.

[2]杨华,张小明,邵阳,等.SPIO标记大鼠骨髓基质干细胞及体外磁共振成像研究[J].第三军医大学学报,2008,30(17):1626.
YANG Hua,ZHANG Xiao-ming,SHAO Yang,et al.Superparamagnetic iron oxide labeled mesenchymal stem cells and their magnetic resonance imaging in vitro[J].J Third Mil Med Univ,2008,30(15):1626.

[3]邓均,贺娟,郑峻松,等.AEAPS与葡聚糖共修饰超顺磁纳米颗粒的制备及性质[J].第三军医大学学报,2009,31(19):1866.
DENG Jun,HE Juan,ZHENG Jun-song,et al.Preparation and performance test for AEAPS/Dextran-modified superparamagnetic iron oxide nanoparticles[J].J Third Mil Med Univ,2009,31(15):1866.

[4]贺娟,贾延辉,邓均,等.甘露糖修饰超顺磁纳米颗粒的制备及体外特性分析[J].第三军医大学学报,2011,33(15):1586.
He Juan,Jia Yanhui,Deng Jun,et al.Preparation and in vitro features of mannose-modified superparamagnetic iron oxide nanoparticles[J].J Third Mil Med Univ,2011,33(15):1586.

[5]文明,欧阳羽,柏玮,等.磁标记反义探针对小鼠的急性毒理观察[J].第三军医大学学报,2009,31(05):398.
WEN Ming,OUYANG Yu,BAI Wei,et al.Acute toxicity in mice of antisense probe labeled with magnetism, c-erbB2 antisense probe labeled with superparamagnetic iron oxide nanoparticles[J].J Third Mil Med Univ,2009,31(15):398.

[6]陈加荣,杨柳,戴刚,等.SPIO、GFP双重标记猪骨髓间充质干细胞的研究[J].第三军医大学学报,2011,33(21):2313.

[7]杨德忠,王伟,王微,等.旁分泌机制在脂肪间充质干细胞移植治疗心肌梗死中的作用[J].第三军医大学学报,2013,35(09):874.
Yang Dezhong,Wang Wei,Wang Wei,et al.Role of paracrine mechanism in treatment of myocardial infarction by adipose-derived mesenchymal stem cell transplantation in mice[J].J Third Mil Med Univ,2013,35(15):874.