

论著

组织辐射损伤与胎肝Sca-1阳性细胞的移植后分布

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摘要 目的: 探讨在同种异体造血重建中组织辐射损伤与胎肝Sca-1+细胞及其子代细胞移植后在不同组织器官分布差异的联系。方法: 用快速PCR和免疫磁珠分选技术鉴定并分离14.5 d雄性胚胎小鼠肝脏Sca-1+细胞; 将分离的Sca-1+细胞(2×10^4 细胞/只)通过尾静脉输入到受 $[Co^{60}]$ 致死剂量(8Gy/只)照射的同系成年雌性小鼠体内, 重建受体小鼠的造血功能; 在输入细胞6个月后, 处死受体小鼠, 取出肾、肝、肺、胃和小肠组织固定制片; 用Y染色体探针进行荧光原位杂交、荧光显微图像系统观察、摄像和分析。结果: 输入 2×10^4 细胞/只的雄性胎肝Sca-1+细胞可完全重建经致死剂量照射雌性小鼠的造血功能; 造血重建半年后, 在受体小鼠的肾、肝、肺、胃和小肠等多个器官组织内可检出含Y染色体的细胞, 显微图像计数各器官组织切片中含Y染色体细胞率分别为: 肾脏(1.65 ± 0.18)%、肝脏(0.90 ± 0.10)%、肺(1.90 ± 0.60)%、胃(6.10 ± 0.50)%和小肠(7.61 ± 2.30)%。各组织中含Y染色体细胞的检出率呈小肠>胃>肺>肾>肝的趋势, 结合资料分析显示与各组织对辐射的敏感性强弱及组织细胞更新率大小基本一致。结论: 胎肝Sca-1+细胞向各组织细胞的分化与组织器官受损程度可能存在一定的联系。

关键词 胎肝肝 Sca-1+细胞; 造血重建; 辐射损伤; 移植; 小鼠

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Tissue irradiation injury and past-transplantation distributing diversity of Sca-1 positive cells from murine fetal liver

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Abstract

AIM: To study the relationship between tissue irradiation injury and past-transplantation distributing diversity of Sca-1 positive cells from murine fetal liver and their offspring cells in multi-organs after syngeneic sex mismatch hematopoietic remodeling. METHODS: The Sca-1 positive cells from the livers of C57BL/ 6j male mouse fetus aged 14.5 day were identified and separated by quick PCR and magnetic cell sorting (MACS) techniques. In order to reconstruct hematopoiesis of the adult female mice, which were lethally irradiated with 8G of $[Co^{60}]$, the 2×10^4 of Sca-1+ cells were transplanted through caudal vein into each of them. After 6 months, these recipient mice were sacrificed, and their kidneys, livers, lungs, stomachs, and small intestines were taken out, fixed and slices were made. Fluorescence in situ hybridization was performed and observed by fluorescent microscope. Images were captured and analyzed through appropriate cool CCD and software. RESULTS: After 2×10^4 of Sca-1+ cells were transfused, the hematopoietic function in the lethally irradiative female mice was completely restored. The cells containing Y chromosome were observed 6 months latter in multi-organs, including kidney, liver, lung, stomach, and small intestine. The frequency of the cells containing Y chromosome respectively was kidney (1.65 ± 0.18)%, liver (0.90 ± 0.10)%, lung (1.90 ± 0.60)%, stomach (6.10 ± 0.50)%, and small intestine (7.61 ± 2.30)%, presented the trend of small intestine>stomach>lung>kidneys>liver. Combined informational analysis showed that the presenting frequency of the cells containing Y chromosome was consistent with the irradiative sensitivity of the organ.
CONCLUSION: These findings suggest that the capability of differentiation of Sca-1 positive cells from murine fetal liver was potentially connected to the extent of damage in these organs when transferred in vivo.

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