

[1]关雪晶,吴宏,何晓莉,等.当归多糖对辐射损伤小鼠骨髓基质细胞的影响[J].第三军医大学学报,2013,35(08):779-783.

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## 当归多糖对辐射损伤小鼠骨髓基质细胞的影响(PDF) 分

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**Title:** Effects of Angelica polysaccharides on bone marrow stromal cells in radiation injured mice

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**关键词:** [当归多糖](#); [辐射损伤](#); [骨髓基质细胞](#); [凋亡率](#); [黏附分子](#)

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**摘要:** 目的 研究当归多糖(Angelica polysaccharides, APS)对辐射损伤小鼠骨髓基质细胞(bone marrow stromal cell, BMSC)的保护作用。方法 BALB/c小鼠按随机数字表法分为10组,每组24只,共计240只。正常组不作任何处理,其余9组经X射线照射后分别给予生理盐水(NS)、2 mg/kg APS和8 mg/kg APS,给药至第7、14、21天计数小鼠外周血白细胞(WBC)、红细胞(RBC)、血小板(PLT)及骨髓单个核细胞(BMNC);观察BMSC生长达80%贴壁所需时间及形成的成纤维细胞集落(CFU-F)数量;流式细胞术检测BMSC细胞周期、凋亡率及表面黏附分子CD54、CD106的表达水平。结果 与正常组比较,NS组外周血WBC、RBC、PLT及BMNC计数明显减少( $P<0.05$ );BMSC达80%贴壁所需时间明显延长,CFU-F数明显减少( $P<0.05$ );G<sub>0</sub>/G<sub>1</sub>期细胞比例显著增加,S期细胞比例显著降低( $P<0.05$ );BMSC细胞凋亡率明显增高( $P<0.05$ );CD54、CD106表达明显降低( $P<0.05$ )。2 mg/kg APS、8 mg/kg APS组与NS组相比,外周血各指标、BMNC数及CFU-F数明显增加( $P<0.05$ );BMSC达80%融合时间显著缩短( $P<0.05$ );G<sub>0</sub>/G<sub>1</sub>期比例明显降低,S期比例显著增加( $P<0.05$ );凋亡率显著降低( $P<0.05$ );CD54、CD106表达明显增高( $P<0.05$ )。第21天8 mg/kg APS组各指标均恢复正常。结论 APS可能是通过提高BMSC贴壁及增殖能力,加速BMSC由G<sub>0</sub>/G<sub>1</sub>期向S期转换,降低BMSC凋亡率,上调CD54、CD106表达来促进辐射损伤后小鼠造血功能的恢复。

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polysaccharides (APS) on bone marrow stromal cells (BMSCs) in radiation injured mice.

**Methods** Two hundred and forty BALB/c mice were randomly divided into 10 groups, including a normal group, three NS groups, three 2 mg/kg APS groups and three 8 mg/kg APS groups, and there were 24 mice in each group. All the mice except for those of the normal group underwent X-ray radiation, and the radiated mice were injected with NS, 2 mg/kg APS and 8 mg/kg APS for 7, 13 and 21 d, respectively. The numbers of white blood cells (WBC), red blood cells (RBC), platelets and bone marrow mononuclear cells (BMNCs) in peripheral blood were recorded by cell counting after treatment. The time for BMSC growing to 80% adherence and the number of fibroblast colony-forming unit (CFU-F) were observed. Cell cycle, apoptotic ratio and the expression of CD54 and CD106 on BMSC were detected by flow cytometry.

**Results** Compared with the normal group, the cell counts of WBC, RBC, platelets and BMNC in peripheral blood of the NS groups decreased significantly ( $P<0.05$ ), the time for BMSCs growing to 80% adherence prolonged significantly ( $P<0.05$ ), and the number of CFU-F was significantly decreased ( $P<0.05$ ). The results of flow cytometry showed that compared with the normal group, the percentage of BMSCs was significantly increased at  $G_0/G_1$  phase but significantly declined at S phase ( $P<0.05$ ), the apoptotic ratio was significantly increased ( $P<0.05$ ), and the expression of CD54 and CD106 on BMSC was decreased significantly ( $P<0.05$ ).

Compared with the NS groups, the results of the 2 mg/kg APS groups and 8 mg/kg APS groups showed that the numbers of peripheral blood cells, BMNCs and CFU-F significantly increased ( $P<0.05$ ), the time for BMSC growing to 80% adherence was significantly decreased, the percentage of BMSCs was significantly decreased at  $G_0/G_1$  phase but significantly increased at S phase ( $P<0.05$ ), the apoptotic ratio was significantly decreased ( $P<0.05$ ), and the expression of CD54, CD106 on BMSC was significantly increased ( $P<0.05$ ). The indicators of the 8 mg/kg APS groups returned to normal levels on the 21st day.

**Conclusion** For BMSCs, APS can promote adherence and proliferation, accelerate transition from  $G_0/G_1$  phase to S phase, decline apoptotic ratio, and up-regulate the expression of CD54 and CD106, so as to accelerate the hematopoietic recovery of radiation injured mice.

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