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人参皂苷Rg_1诱导人白血病K562细胞株衰老的实验研究

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作者中文名	作者英文名	单位中文名	单位英文名	E-Mail
蔡世忠	CAI Shizhong	重庆医科大学 干细胞与组织工程研究室 组织学与胚胎学教研室, 重庆 400016	Department of Histology and Embryology, Institute of Stem Cell and Tissue Engineering, Chongqing Medical University, Chongqing 400016, China	
周玥	ZHOU Yue	重庆医科大学 干细胞与组织工程研究室 组织学与胚胎学教研室, 重庆 400016	Department of Histology and Embryology, Institute of Stem Cell and Tissue Engineering, Chongqing Medical University, Chongqing 400016, China	
刘俊	LIU Jun	重庆医科大学 干细胞与组织工程研究室 组织学与胚胎学教研室, 重庆 400016	Department of Histology and Embryology, Institute of Stem Cell and Tissue Engineering, Chongqing Medical University, Chongqing 400016, China	
刘典峰	LIU Dianfeng	重庆医科大学 干细胞与组织工程研究室 组织学与胚胎学教研室, 重庆 400016	Department of Histology and Embryology, Institute of Stem Cell and Tissue Engineering, Chongqing Medical University, Chongqing 400016, China	
姜蓉	JIANG Rong	重庆医科大学 干细胞与组织工程研究室 组织学与胚胎学教研室, 重庆 400016	Department of Histology and Embryology, Institute of Stem Cell and Tissue Engineering, Chongqing Medical University, Chongqing 400016, China	
王亚平	WANG Yaping	重庆医科大学 干细胞与组织工程研究室 组织学与胚胎学教研室, 重庆 400016	Department of Histology and Embryology, Institute of Stem Cell and Tissue Engineering, Chongqing Medical University, Chongqing 400016, China	ypwangcq@yahoo.cn

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中文摘要:目的: 观察人参皂苷Rg_1(Rg_1)诱导人白血病K562细胞株衰老的作用及其机制。 方法: MTT比色法检测Rg_1对K562细胞增殖的影响,筛选最佳作用浓度及时间(20 μmol·L^{-1},48 h)。流式细胞术检测Rg_1对细胞周期的影响;SA-β-Gal染色检测细胞阳性染色百分率;RT-PCR法检测衰老相关基因p16,p53,p21,Rb的表达;电镜观察细胞衰老超微形态学改变。 结果: Rg_1在体外能明显抑制K562细胞增殖,使细胞阻滞于G_2/M期; SA-β-Gal染色阳性细胞百分率显著增高($P<0.05$);细胞衰老相关基因的表达上调($P<0.05$);超微结构观察显示细胞增大,异染色质凝集、碎裂,线粒体体积增大,溶酶体体积增大、数目增多等衰老形态学变化。 结论: Rg_1能诱导K562细胞衰老,p53-p21-Rb,p16-Rb信号转导通路在其衰老调控中起重要作用。

中文关键词:人参皂苷Rg_1 白血病 K562细胞株 细胞衰老

Experimental study on human leukemia cell line K562 senescence induced by ginsenoside Rg_1

Abstract: Objective : To observe the effect and mechanism of ginsenoside Rg_1 in inducing senescence human leukemia K562 cell line. Method : Proliferation of K562 cell line induced by Rg_1 was detected by MTT colorimetric test for the purpose to screen optimal active concentration and time (20 μmol·L^{-1}, 48 h). Impact of Rg_1 on cell cycle was analyzed using flow cytometry. The percentage of staining positive cells was detected by SA-β-Gal staining. The expressions of senescence-related genes such as p16, p53, p21, Rb, were detected by RT-PCR and the changes in ultramicro-morphology were observed by transmission electron microscopy. Result : Rg_1 can significantly inhibit the proliferation of K562 cells *in vitro* and arrest the cells in G_2/M phase. The percentage of positive cells stained by SA-β-Gal was dramatically increased ($P<0.05$) and the expression of cell senescence-related genes were up-regulated. The observation of ultrastructure showed that cell volume increase, heterochromatin condensation and fragmentation, mitochondrial volume increase, lysosomes increase in size and number. Conclusion : Rg_1 can induce the senescence of leukemia cell line K562 and play an important role in regulating p53-p21-Rb, p16-Rb cell signaling pathway.

keywords:ginsenoside Rg_1 leukemia K562 cell line cell senescence

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