

论文

维泰醇对小鼠淋巴白血病细胞促进凋亡的作用及其机制

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摘要:

维泰醇(alternol)是利用红豆杉树皮中一种微生物菌诱变株,经过发酵、纯化等工艺分离出的新型单体化合物。本研究探讨维泰醇对小鼠淋巴白血病(L1210细胞)的作用及其机制。采用MTT法检测维泰醇对细胞活力的影响,用形态学方法、DNA凝胶电泳和流式细胞仪检测细胞凋亡,以Western blotting法检测与凋亡相关蛋白的表达。维泰醇对L1210细胞的增殖有明显抑制作用;处理后的细胞表现出凋亡特有形态学改变,细胞凋亡比率的增加有时间依赖性;维泰醇能降低细胞线粒体跨膜电位( $\Delta\Psi_m$ ),增加细胞内活性氧(ROS)的水平,并引起细胞DNA发生片段化,形成典型的梯状条带;维泰醇能下调Bcl-2/Bax表达比率,并且上调caspase-3和caspase-9的表达,但是对caspase-8的表达没有明显的影响。维泰醇可能通过激活线粒体调控的凋亡通路诱导L1210细胞凋亡。

关键词: 维泰醇 小鼠淋巴白血病细胞 细胞凋亡 线粒体跨膜电位 Bcl-2家族蛋白

Apoptosis-inducing effect of alternol on mouse lymphocyte leukemia cells and its mechanism

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Abstract:

Alternol is purified from fermentation productions of microorganisms named as *Alternaria alternata* var. *monosporus*. The research is to investigate the apoptosis-inducing effect of alternol on mouse lymphocyte leukemia (L1210) cells and the possible mechanisms. MTT method was used to evaluate the viability of L1210 cells. Apoptosis of L1210 cells was detected by morphological assessment, DNA electrophoresis assay and flow cytometry. Western blotting analysis was carried out to determine the apoptosis-related proteins. Proliferation inhibition of L1210 cells by alternol was found remarkably in a dose-dependent manner. When treated with alternol, apoptotic morphological features of L1210 cells were observed by fluorescent microscopy (AO/EB) and the apoptosis rate was also elevated in a time-dependent manner. After treatments with various concentrations of alternol for 48 h, DNA laddering appeared. The increase of reactive oxygen species (ROS) production was found after cells were exposed to alternol for 6 h, while the decrease of mitochondrial transmembrane potential ( $\Delta\Psi_m$ ) was not found until cells were exposed to alternol for 24 h. Furthermore, the level of Bcl-2 and Bcl-2/Bax was down-regulated, while the level of caspase-3 and caspase-9 but not caspase-8 was up-regulated when alternol was added for 72 h. In summary, the results suggested that alternol could inhibit the proliferation of L1210 cells and induce apoptosis of L1210 cells, which was mediated by mitochondria-dependent pathway.

Keywords: mouse lymphocyte leukemia cell apoptosis mitochondrial transmembrane potential Bcl-2 family protein alternol

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