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摘要: 人类机体的免疫系统很难彻底清除肿瘤细胞,了解T淋巴细胞杀伤肿瘤细胞的整个过程的机理,将为提高免疫系统杀灭肿瘤的效率提供知识基础。本文采用原子力显微镜与倒置显微镜在细胞层面上观察T淋巴细胞进攻杀伤人慢性粒细胞性白血病细胞株—K562细胞的过程,并对T细胞与K562细胞共培养前后的表面形貌和生物机械性质进行表征。结果显示,与培养前相比,共培养后2种细胞数目之和减少,2种细胞的表面形貌和机械力学性质均出现很大差异,表现为:K562细胞,平均粗糙度(Ra)降低,细胞平均高度(Mh)降低,细胞表面出现5~8 μm的孔洞,有的细胞甚至完全破裂溶解。多个T细胞的统计分析结果显示,共培养前,T细胞为静息状态,而共培养后Ra和Mh都显著增加。该方法为研究免疫系统与肿瘤相互作用的机制提供重要的切入点。

关键词: T淋巴细胞, K562细胞, 原子力显微镜

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Observation of the process of coculturing T lymphocyte and K562 cells with AFM

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Abstract: Human immune system is sometimes hard to remove tumor effectively. Therefore, understanding of the process and mechanism that T lymphocyte cells destroy tumor cells is very important for developing anti-tumor immunotherapies. In this paper, the inverted microscope was used to observe the process that T lymphocyte cells (TL) cocultured with K562 cells. And also, the atomic force microscope was used to detect the changes in cell morphology properties before and after two kinds of cells cocultured. The results indicated that TL could burrow into K562 cells and then killed the host cells, but the fate of most of the TL were changed as well. This special phenomenon provided an important evidence of interactive mechanisms between immune system and tumor cells at single cell level.

Key words: T lymphocyte cell, K562 cell, Atomic force microscope (AFM)

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