

周期加载对VEC-304细胞株迁移、增殖分布的影响

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在弹性膜上接种VEC-304, 融合生长后擦去周边细胞形成一规则圆斑, 使用弹性膜周期加载装置, 对生长在弹性膜上的VEC-304圆斑施以15%拉伸应变, 经显微镜观察, 计算机图像处理了解细胞增殖、迁移时间过程及增殖细胞在应变场中的分布, 细胞银染了解细胞形态及细胞连接情况, 免疫荧光染色观察增殖细胞的分裂极。结果发现: (1) 随加载时间延长圆斑沿与应变垂直向伸展成椭圆形, 24 h两径出现明显差异; (2) 随时间增加圆斑面积扩大, 但实验组沿与加载垂直方向的增大较沿加载方向为大; (3) 细胞有丝分裂器(中心粒)位于细胞短轴即加载方向; (4) 加载后细胞较对照组排列紧密, 细胞间距更小, 且出现较为明显的重叠生长现象。VEC-304在应变场中的运动迁移、增殖具有方向依赖性, 周期加载可以促进细胞间连接。

THE PROLIFERATION AND MIGRATION RESPONSES OF VEC-304 CELL-LINE SUBJECTED TO CYCLIC TENSION STRAIN

The VEC-304 cells were planted on elastic silicon membrane to confluent, then the redundant cells were erased and a round dot of cells was left on the membrane (the diameter of dot about 1mm), the membrane was cyclically stretched to a maximum deformation of 15%(0.67 Hz) by a membrane-stretching device. Silver nitrate-stain, immunofluorescence, microscopic observation, computer image processing, were applied to investigate the proliferation and migration responses of VEC-304. The result show that: (1) the proliferation of VEC-304 cells is stimulated by stretch, and the proliferation on the perpendicular direction to the stretch is more remarkable than the parallel direction, so the round dot of cells changed into elliptical one, whose long axis perpendicular to the stretch direction. (2) The migration of VEC-304 cells is not obvious in both stretch group and control group, suggested that migration is not the prominent response to the stretch in our investigation. (3) The space between cells being narrower and the monolayer of VEC-304 being overlap after VEC-304 cells being stretched. All those result suggested the responses of VEC-304 subjected to cyclic stretch have orientational different.

关键词

周期应变(Cyclic tension strain); 增殖(Proliferation); 迁移(Migration)