

基底周期拉伸引起ECV-304细胞形态学变化的分析

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对ECV-304细胞施以最大应变10%、0.67 Hz的周期拉伸,利用计算机图像处理系统,对周期拉伸过程中ECV-304细胞的取向调整进行了形态学分析,结果显示:周期拉伸能引起细胞长轴取向垂直于最大主应变方向;加载12 h内细胞长短径比增加,12~24 h之间长短径比下降,随后趋于稳定;细胞在周期拉伸最大主应变方向上的最大截距缩短,而在垂直于最大主应变方向上的最大截距延长;取向调整的过程与长短径比增大的过程有显著的相关性。表明在周期拉伸过程中的取向调整是一个细胞具有方向差异性的变形过程,而不是刚性的旋转或位移。

THE MORPHOLOGICAL ANALYSIS FOR THE ORIENTATION ADJUSTMENT OF ECV-304 CELLS UNDER CYCLIC STRETCH

Cyclic stretch was exerted on ECV-304 cells (maximum strain 10%, 0.67 Hz). The morphological change and orientation adjustment of ECV-304 cells was analyzed by the computer image processing system. It was shown that the long axes of cells tend to be perpendicular to main strain direction after cyclic stretched for 3 h. The ratio of cellular long axis to short axis increase during the first 12 h of stretching, decrease during 12 h to 24 h, and then turned to be stabilized. Obvious relativity existed between cell orientation adjustment and change of the ratio of short/long axis during the first 6 h of stretching. The intercept in the strain direction was shortened but in the direction vertical to strain was increased. It suggested that the cyclic stretch adjust the orientation of ECV-304 cells through the distinguishingly deforming course of cells in different direction, but not through rigid circumrotation or displacement of cells.

关键词

细胞力学(Cell biomechanics); 形态学(Morphology); 周期拉伸(Cyclic stretch); 图像分析(Image processing)