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Development of miniaturized uniaxial cell stretching device

Jaewon Kim and Sungsu Park
Sungkyunkwan University, South Korea

Cells react variously to external mechanical stimuli such as shear stress from fluid flow or tensile stress caused by substrate deformation. As a result, their structural and functional properties are largely affected by these mechanical stresses, and this phenomenon has been extensively investigated by using cell stretching devices. However, conventional cell stretching devices still have technical limitations to observe such complicated cellular responses. For example, many cell stretching devices are too large to be placed on the stage of microscope and often generate excessive heat and vibration, which are harmful for cells. To overcome these technical limitations, we developed a new type of cell stretching device which can be operated either statically or cyclically by pneumatic force to reduce the generation of excessive heat and vibration. In addition, its size is small enough to be placed on the stage of the microscope. We demonstrate the feasibility of the stretching device for application in cellular experiments by observing the effect of static stretching longitudinally on cell junction and its structural instability in intestinal epithelial cells.

Biography

Jaewon Kim has completed his Master's degree at Sungkyunkwan University. Now, he is pursuing PhD in Mechanobiology at the same university.

kjw1394@skku.edu

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