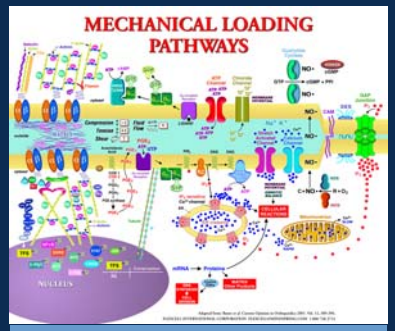
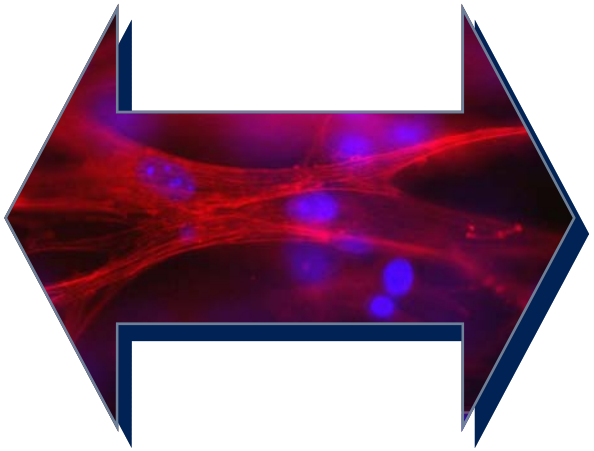
Why culture cells in a mechanically active environment?

Cells are subjected to compression, tension, and shear in the body and undergo acute and adaptive biochemical changes in response to deformation. Stressing cells in culture simulates the in vivo environment causing dramatic morphologic and biochemical responses. Several of the pathways activated in response to mechanical load can be analyzed in real-time. Flexcell®'s microscopy devices can be used to visualize cells in both 2D and 3D culture systems in real-time that are being subjected to mechanical load .



Pathways activated in response to applied mechanical load.

Culturing cells



in a mechanically active environment

Flexcell®
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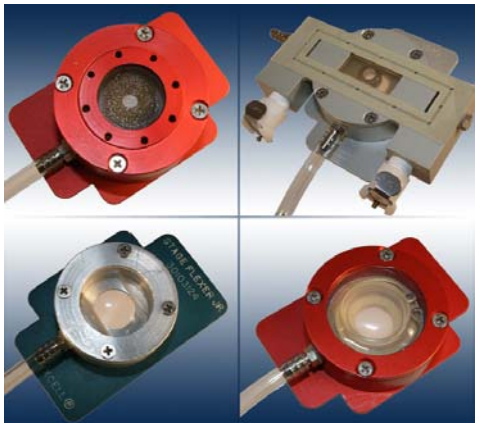
Microscopy Devices

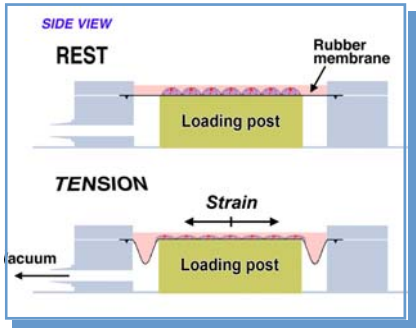
View real-time cellular responses to mechanical load



Flexcell®
Microscopy Devices

StageFlexer®

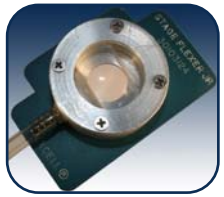
The StageFlexer® is designed to strain cells in monolayer while viewing the cellular activity under a microscope. The FX-5000™ or Flex Jr. Tension System can control the strain frequency, amplitude, waveform, and cycles (or time period).



Strain application to cells in a StageFlexer® device

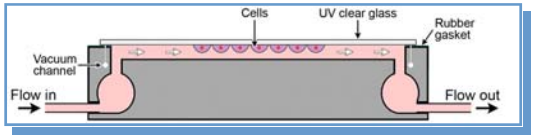
StageFlexer® Jr.

The StageFlexer® Jr. accepts membranes removed from BioFlex®, UniFlex®, or Tissue Train® culture plates and allows the user to continue to strain cells while observing responses in real-time.



FlexFlow™

The FlexFlow™ is a parallel plate laminar flow device designed to apply fluid shear stress and/or cyclic strain to cells in culture while providing a means for viewing cell activity under a microscope in real time. The FlexFlow™ fits on the stage of a standard upright microscope.



Shear stress application to cells in a FlexFlow™ device

Flex Jr. Tension System

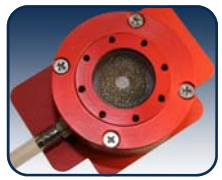
Patented, computerized, pressure-operated instrument that applies a defined controlled, static or variable duration cyclic tension, to cells in our microscope devices.

Utilizes regulated vacuum pressure to deform flexible membranes.

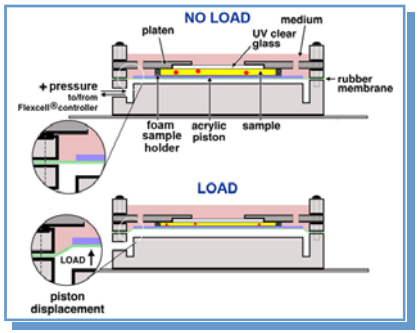
Works with StageFlexer®, StageFlexer® Jr., and FlexFlow™ devices.

Flexcell® Flex Jr. Tension System

StagePresser™



The StagePresser™ is designed to compress a single tissue sample or cells in 3D culture while viewing the cellular activity under a microscope. The FX-5000™ Compression System controls the compression frequency, amplitude, waveform, and cycles.



Compression application to cells in a StagePresser™ device

Device	Strain Range
StageFlexer®	1.6% - 14.8% (25 mm) 1.9% - 13.4% (28 mm) 2.1% - 8.6 % (31 mm)
StageFlexer® Jr.	1.8% - 13. 8% (BioFlex®) 2.5% - 17.7% (Tissue Train®) 1.5% - 7.9% (UniFlex®)
FlexFlow™	0.8% - 4.3%

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