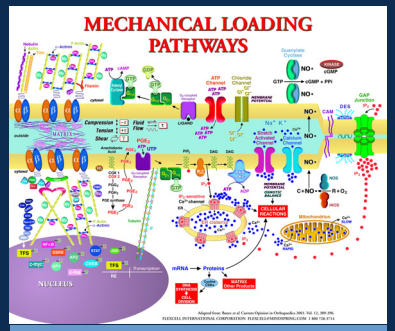
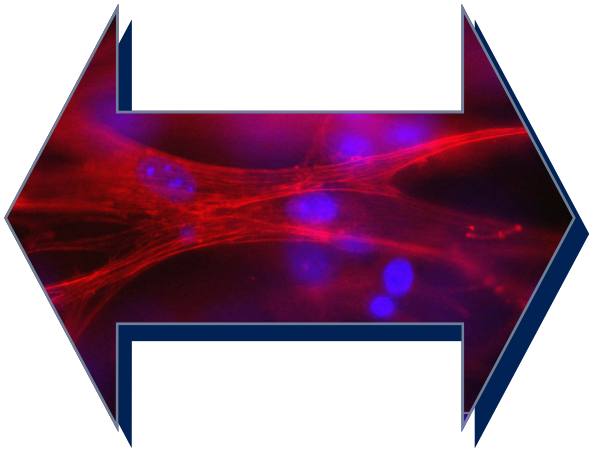
Why culture cells in a mechanically active environment?

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. Flexcell®'s tension, compression, and fluid shear systems have broad applications since strain, compression, or fluid flow have been found to induce biochemical changes in cells derived from a variety of tissues including cardiac, skeletal and smooth muscle, lung, vascular endothelium, skin, tendon, ligament, cartilage, and bone.



Pathways activated in response to applied mechanical load.

Culturing cells



in a mechanically active environment

Flexcell®
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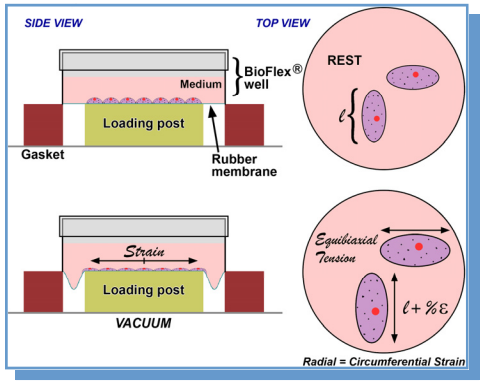
FX-6000™ TENSION SYSTEM

Dynamic culture bioreactor for cells in monolayer or 3D culture

Flexcell® FX-6000™ Tension System

The FX-6000™ Tension System is a patented, computerized instrument that applies a defined controlled, static or variable duration cyclic tension, to cells growing *in vitro*. This system uses regulated vacuum pressure **and** positive air pressure to deform flexible-bottomed culture plates.

Various combinations of Flexcell® culture plates and loading stations can be interchanged to allow for application of either equibiaxial, uniaxial, or gradient tension to cells in monolayer or 3D cell culture, allowing studies to better mimic the *in vivo* environment.



Schematic of equibiaxial strain application to cells cultured in a BioFlex® well and placed atop a cylindrical loading post.

Highlights

Apply equibiaxial or uniaxial tension to cells in 2D and 3D culture.

Simulate *in vivo* tissue strains and frequencies in an *in vitro* setting.

Contains state-of-the-art digital valve to automatically regulate and maintain pressure for a specified strain regimen.

Multiple frequency, amplitude, and waveform changes can be programmed in one regimen.

Drives up to four independent FlexLink® remote compression and/or tension controllers.

Flexcell® FX-6000™ Tension System

Culture Plate + Loading Station (LS)	Max Strain
BioFlex® + Cylindrical LS	21.8% Equibiaxial
Tissue Train® + Arctangle® LS	20.8% Uniaxial
UniFlex®+ Arctangle® LS	12.2% Uniaxial
HT BioFlex®+ Cylindrical LS	8.0% Equibiaxial
BioFlex® + No LS	30% Gradient

Culture plates compatible with the FX-6000™ Tension System

FX-6000™ Tension System includes:

- Laptop computer
- FlexSoft FX-6000™ software
- Tension FlexLink®
- Tension accessory package:
  - ◊ BioFlex® baseplate and four gaskets
  - ◊ BioFlex® Loading Stations™ with 25 mm diameter Loading Posts
  - ◊ Four BioFlex® Cell Seeders
  - ◊ Four BioFlex® culture plates
  - ◊ Drying filter, water trap, vacuum tubing, and grease/lubricant

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