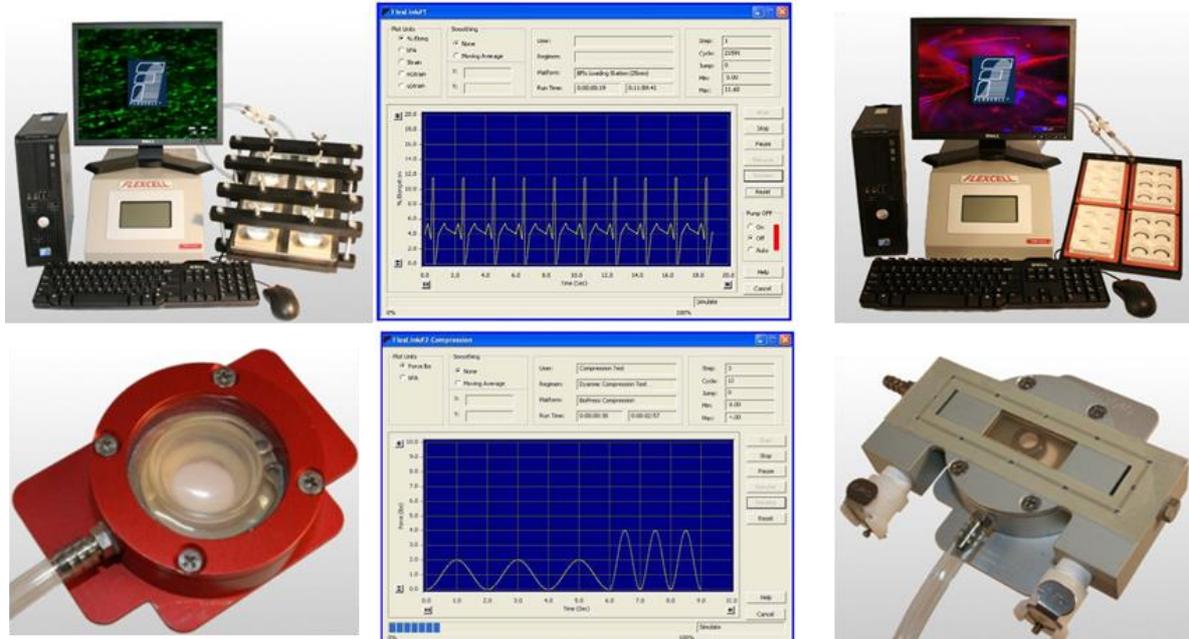




Cellular Biomechanical Systems

2D/3D Culture, Tension, Compression, Shear Stress, Tissue Engineering

Exclusively represented in Europe by Dunn Labortechnik



Used worldwide, and cited in more than 4,000 publications in scientific journals such as "Circulation", "Journal of Cell Biology", "Nature", "PNAS", and many more.

- **Flexcell® Tension & Compression Systems:** Computer regulated bioreactors that apply cyclic or static tensile strains or compression to cells cultured *in vitro* (page 2).
- **Tissue Train® Culture System:** 3D cell culture in a gel matrix with or without cyclic uniaxial tension (page 2).
- **Microscopy Devices:** Single-well devices of the Tension or Compression apparatus to observe signaling responses to strain in real time on a microscope stage (page 3).
- **ScanFlex™:** Scans and saves images of 3D tissue constructs (page 2).
- **Flow Devices & Controllers:** Apply fluid shear stress to cells with the Streamer® and FlexFlow™ systems (page 3).
- **Osci-Flow®:** Flow controller for regulated oscillatory and pulsatile flow control, to be used with the Streamer® or the FlexFlow™ system (page 3).
- **Specific 6- and 24-well Culture Plates, Membranes and Culture Slips®** designed to be used with the Flexcell® equipment (page 3 and page 4).

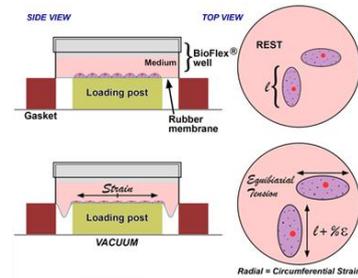
Upgrade your existing system and increase your research potential:

- Add another Tension or Compression FlexLink®: Run multiple regimens at one time.
- Flexcell® Baseplate Kits: Add Tension and Tissue Train® features or use the 24-well High Throughput BioFlex® Culture Plates.
- Use microscopy devices for real time observations, or Transwell® Holders (page 4) for cell migration and co-culture assays.

Simulate *in vivo* tissue strains/forces and frequencies in cells from muscle, lung, heart, blood vessels, skin, tendon, ligament, cartilage, and bone.

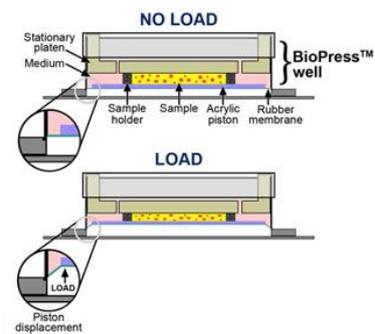
NEW! Flexcell® FX-6000 Tension System

- Apply equibiaxial or uniaxial tension to cells in 2D and 3D culture. Simulate *in vivo* tissue strains and frequencies in an *in vitro* setting.
- Digital valve automatically regulates and maintains vacuum pressure **and** positive air pressure deforming a flexible-bottomed Flexcell® culture plate.
- Multiple frequency, amplitude, and waveform changes can be programmed in one regimen.
- Drives up to four independent FlexLink® remote compression and/or tension controllers.



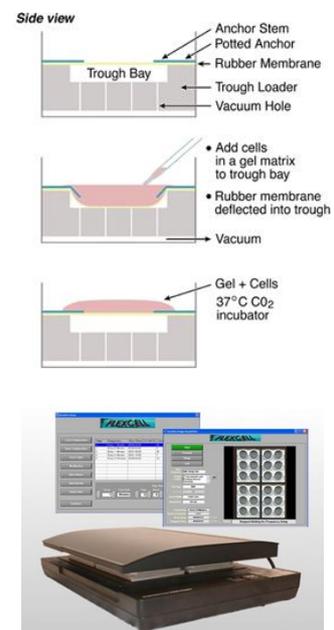
Flexcell® FX-5000 Compression System

- Apply cyclic or static compression to tissue samples or 3D cell-seeded constructs
- Computerized, pressure-operated instrument that applies a defined controlled, static or variable duration cyclic compression to cells growing *in vitro*.
- Utilizes regulated air pressure to deflect flexible-bottomed BioPress™ culture plates compressing a tissue sample or 3D culture between a piston and a stationary platen.
- Can apply up to 14 pounds of applied force.



Flexcell® FX-5000 Tissue Train® System and ScanFlex™

- 3D cell culture in a gel matrix with or without cyclic uniaxial tension
- Stand-alone culture system that allows the creation of 3D geometries for cell culture in a matrix gel or allows the cells to build a self-assembled matrix that connects to the anchors in a Tissue Train® culture plate.
- Molds and plates available to create three different shaped hydrogels: linear, trapezoidal, and circular.
- Simulate the strain environment of the native tissue in the body by defining frequency, elongation, and duration of strain.
- **ScanFlex™**: Measure gel compaction in 3D bioartificial tissues
- Automated repetitive scanning process
- Scans and saves images up to 600 dpi of 3D cell constructs
- User defined frequency and time intervals of image capture
- Included XyFlex™ software evaluates area compaction of 3D cell constructs



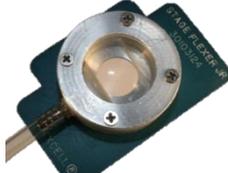
FLEXCELL® FLEX JR.™ Tension System

- Apply cyclic or static tensile strains to cells cultured *in vitro*.
- *In vivo* tissue strains and frequencies simulated to view real-time responses in cells.
- System works with StageFlexer®, StageFlexer® Jr., and FlexFlow™ microscope devices.
- Regulated vacuum pressure deforms flexible membranes in a Flexcell® 6-well culture plate*. **NEW!**

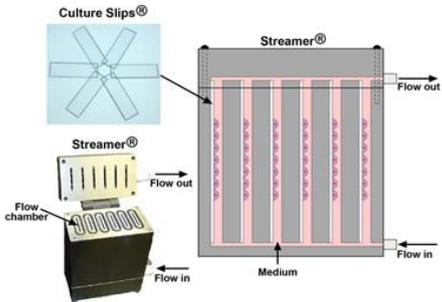
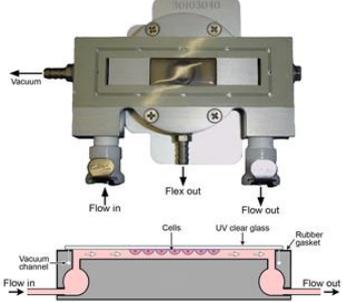
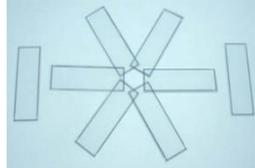


* Optionally when used with a Single Plate Baseplate Kit (SPBK-1000)

Microscopy devices to strain or compress cells while viewing the cellular activity in real-time under an upright microscope.

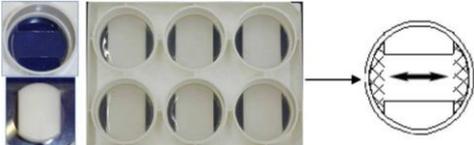
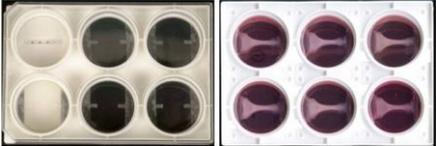
<p>StageFlexer® Equibiaxial strain of cells in monolayer cell cultures.</p> 	<p>StageFlexer® Jr. Equibiaxial or uniaxial strain of cells in monolayer cell cultures.</p> 	<p>Stage Presser™ Compress a single tissue sample or cells in 3D culture.</p> 
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Equipment for fluid shear stress applications, flow regulation, diluting, dispensing, injecting and mixing.

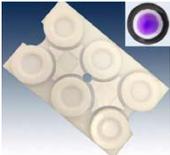
<p>Streamer® Fluid Shear Stress Device</p>  <ul style="list-style-type: none"> • Parallel plate flow system to apply fluid-induced shear stress to cells grown in a monolayer. • Includes a six-chamber laminar flow device and can be used to apply laminar, pulsatile*, or oscillating* flow to cells. • Regulation of shear stress from 0 - 35 dynes/cm² by computer-controlled peristaltic pump included in system. <p>* When used with the Osci-Flow® (see below).</p>	<p>FlexFlow™ Fluid Shear Stress <u>and</u> Microscopy Device</p>  <ul style="list-style-type: none"> • Parallel plate laminar flow device to apply fluid shear stress and/or cyclic strain to cells in culture while providing a means for viewing cell activity under an upright microscope in real time. • Regulation of shear stress from 0 - 35 dynes/cm² by computer-controlled peristaltic pump (included). • Strain cells using the FX-5000™ Tension, Flex Jr. Tension, or Tissue Train® system before, during or after applying shear stress.
<p>Osci-Flow® Flow Controller</p>  <ul style="list-style-type: none"> • Provides regulated oscillatory and pulsatile flow via computer controlled action. • Minimizes flow response lag by eliminating inertial effects of decelerating and accelerating pumps and motors. • Reverses fluid flow instantaneously. • Works with Streamer® and FlexFlow™ devices. • Adapts to other perfusion systems. 	<p>Culture Slips® Surface treated slides for use with Streamer® and FlexFlow™</p>  <ul style="list-style-type: none"> • Rimmed with a 1.0 mm wide PTFE border to help limit cell culture growth to the portion of the slip exposed to fluid flow. • Low autofluorescence. • Matrix-treated to promote cell attachment. • Available untreated or with covalently bonded surfaces - Amino, Collagen (Type I or IV), Elastin, ProNectin (RGD), Laminin (YIGSR).

Flexcell® Culture Plates

Large choice of flexible bottomed culture plates with matrix bonded growth surfaces that promote attachment and growth of a variety of cell types. All plates (except BioPress™ culture plates) available untreated or with covalently bonded surfaces - Amino, Collagen (Type I or IV), Elastin, ProNectin (RGD), Laminin (YIGSR).

<p style="text-align: center;">6-Well BioFlex® Culture Plates</p> <p>Provide uniform equibiaxial strain to cells in monolayer culture when used with Flexcell® Tension and Tissue Train® system and cylindrical BioFlex® Loading Stations.</p>  <p style="text-align: center; font-size: small;">Flexible Rubber Bottom</p>	<p style="text-align: center;">6-Well UniFlex® Culture Plates</p> <p>Provide uniaxial strain to cells in monolayer culture. Compatible with the Flexcell® Tension and Tissue Train® systems when used with Arctangle® Loading Stations™.</p> 
<p style="text-align: center;">6-Well Tissue Train® and Trapezoidal Tissue Train® Culture Plates</p> <p>For use with the Flexcell® Tissue Train® system to provide uniaxial strain to 3D cell-seeded gel constructs. Create linear and trapezoidal-shaped 3D bioartificial tissue constructs using a Trough Loader™ as a mold.</p> 	<p style="text-align: center;">6-Well Tissue Train® Circular Foam Culture Plates</p> <p>For use with the Flexcell® Tension and Tissue Train® system with BioFlex® Loading Stations for providing biaxial strain to circular 3D cell-seeded gel constructs. No Trough Loader™ necessary to create the gel constructs. Matrix-bonded foam circular anchor for improved cell attachment.</p> 
<p style="text-align: center;">24-Well HT BioFlex® Culture Plates</p> <p>Microplate reader compatible plate size for high-throughput applications to be used with the 24-well HT Baseplate Kit. Plates are available in black (for fluorescent imaging) and white (for colorimetric assays).</p> 	<p style="text-align: center;">6-Well BioPress™ Culture plates</p> <p>For use with the Flexcell® Compression system for cyclic or static compression. Ring foam holders keep samples confined to central region of each well.</p> 

Accessories for Flexcell® systems and culture plates.

<p>Transwell® Holder</p> <ul style="list-style-type: none"> • Holds Transwells® to allow for cell migration and co-culture assays to be performed in Flexcell® culture plates. • For 6- and 24-well Flexcell® culture plates. <p style="font-size: x-small;"><i>Transwell® is a registered trademark of Corning® Inc.</i></p> 	<p>Cell Seeder™</p> <ul style="list-style-type: none"> • Confines cells during plating and adhesion to the central area of the BioFlex® membrane. • Cells in the central area are subjected to well defined equibiaxial strains. • Available individually or as a set of 4. 	<p>FlexStop™</p> <ul style="list-style-type: none"> • Reusable valved rubber stopper that provides a convenient negative control when testing mechanical load effects on cells in the same culture plate. • Works with all Flexcell® 6-well culture plates, except BioPress™ plates. 
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