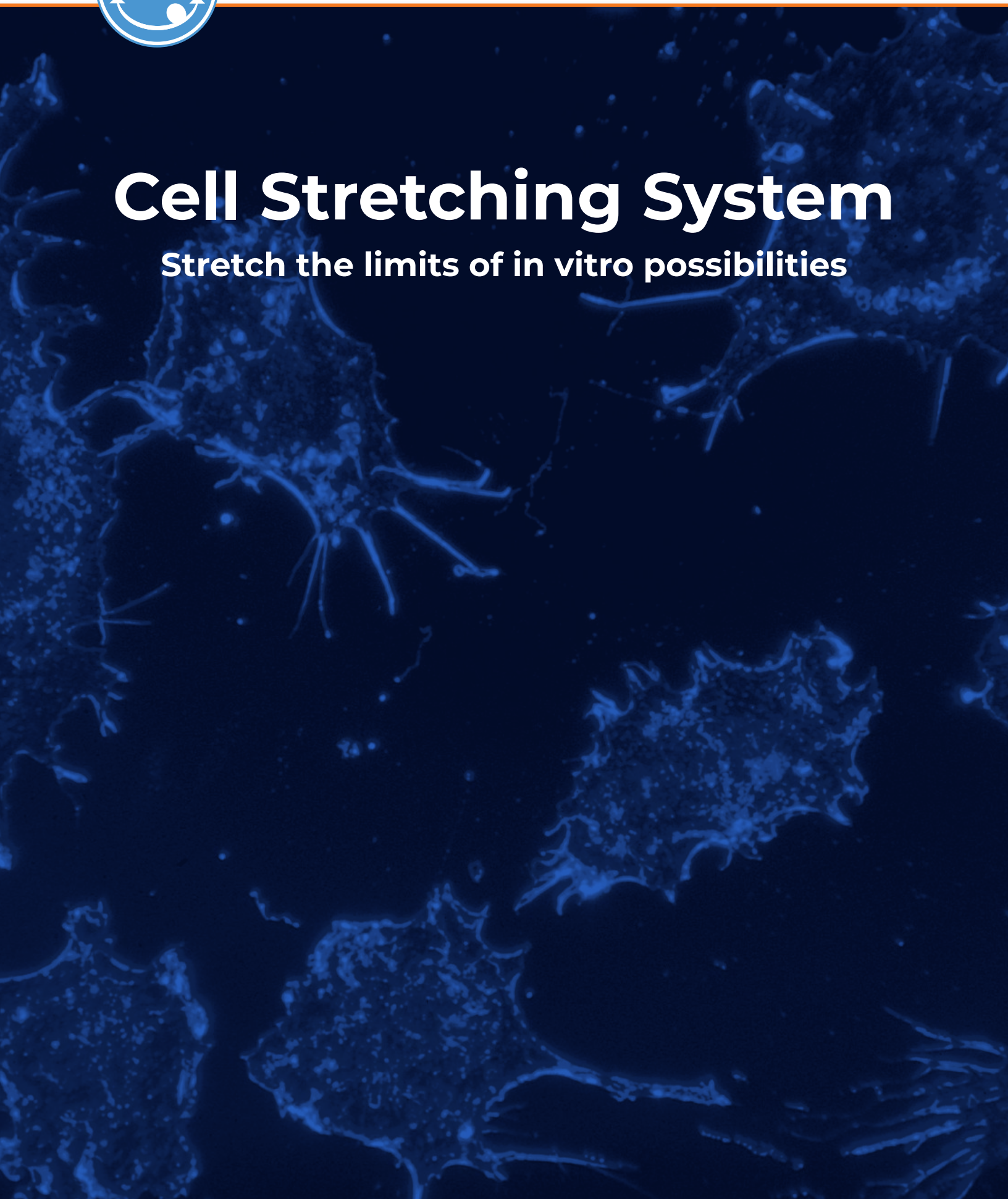
Cell Stretching System

Stretch the limits of in vitro possibilities



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Simulate Physiological Conditions Using Specialized Cell Stretching Systems

Mechanical forces are involved in almost every biological process and are required for many cellular functions. Cardiomyocytes, endothelial cells, smooth muscle cells, and osteocytes are constantly stretched. Studying mechanical cell stress can provide valuable insights into how cells respond to forces in their environment. The Strex Stretching Systems are the perfect tools for modeling in vivo stretching environments under in vitro conditions.

Configurable stretch paradigms

Stretch your cells conveniently in your incubator or on your microscope stage. Apply uni- or biaxial stretch forces in PDMS chambers that fit a variety of applications, from monolayer and cultured cells to spheroids and tissue.

Effortless stretching patterns

Streamline your cell stretching research with 64 pre-programmed stretch patterns that are perfect for your project's needs. Skip the time-consuming process of building patterns from scratch and troubleshooting them.

Ready out of the box

Accelerate your timeline and start stretching as soon as you get your new plug-and-play system, plasma-treated PDMS chambers, and protocols catered to your applications. Forget the trial-and-error phase and start collecting data right away.

Strex Stretching Systems can mechanically stimulate monolayer and cultured cells and tissue in a variety of unique PDMS stretch chambers. Stretch manually to pilot your experiment and set up your protocols, or automate your stretch projects with 64 great preprogrammed stretch patterns for easy, high-throughput, long-term stretching in your incubator. Mount your stretch unit onto your microscope's stage to observe your cells in real time with immunofluorescence or confocal microscopy while applying uniaxial or biaxial stretch.

Applications

- Stem cell differentiation
- Cell morphology
- Gene and protein expression
- Mechanotransduction and signaling
- Cytoskeleton rearrangements
- Ion mobilization
- Calcium influx
- Nitric oxide production

Manual stretch systems

Great for piloting your experiments and collecting preliminary data, the manual stretch devices are the perfect introduction to uniaxial or biaxial cell stretching.

- **Piloting your new stretch project:** Try out different adhesion methods, stretch extents, and staining protocols and see what works for your cells or tissue.
- **Imaging your cells before and after stretch:** View cells under a brightfield or IF microscope without having to take them out of the stretch chamber or device.

Automated stretch systems

The automated systems are ideal for high-throughput and long-duration uniaxial stretching of monolayer or cultured cells in 4 or 10 cm^2 chambers or whole tissue in specialized chambers. Keep the stretch unit in your incubator to control your cells' environment.

- **Modeling different kinds of force:** Take advantage of the preprogrammed cyclic, square wave, or static stretching patterns with stretch extents of 2-20%.
- **Long duration studies:** Apply uniaxial stretch over hours or even days, with the water pump cooling the step motors in the stretch unit.

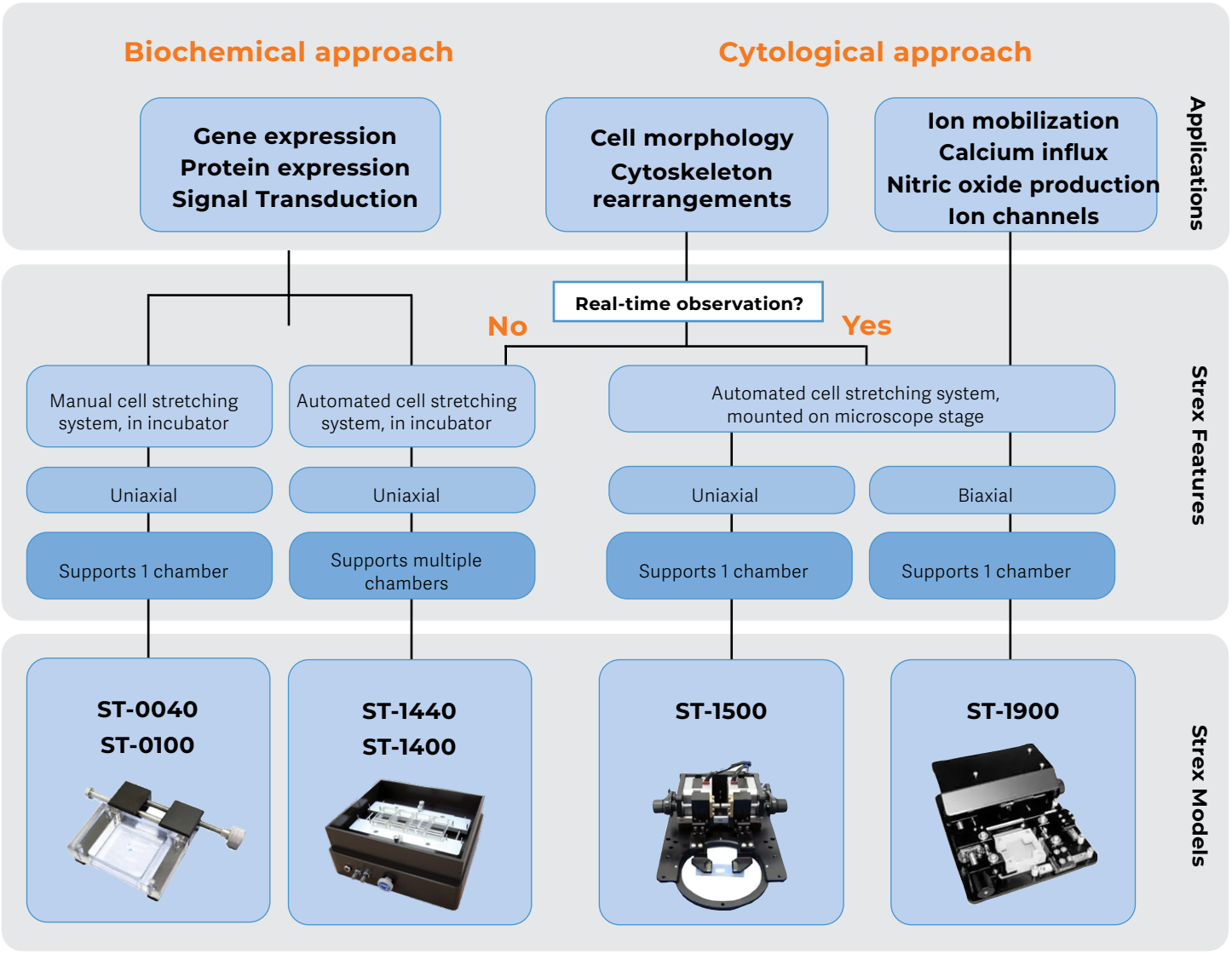
Microscope-mountable stretch systems

The microscope-mountable automated uniaxial and biaxial stretching systems are ideal for single-chamber short-duration stretching of stained monolayer cells while imaging them in real time in your upright or inverted microscope.

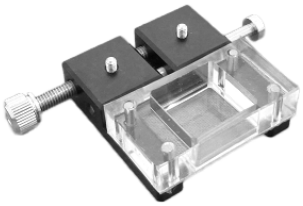
- **Real-time observation of stretched cells:** Use preprogrammed stretching patterns to mechanically stimulate your stained cells in a single chamber while imaging them.
- **Short duration studies:** Apply uniaxial or biaxial stretch over 15-20 minutes, without needing a micro incubator.

Stretch System Models

Features	ST-0040	ST-0100	ST-1440	ST-1400	ST-1500	ST-1900
Applications	• Cytoskeleton rearrangements • Cell morphology • Gene or protein expression • Piloting stretch experiments and preliminary data		• Cytoskeleton rearrangements • Cell morphology • Gene or protein expression • Signal transduction • Long duration studies (hours-days)		• Cytoskeleton rearrangements • Cell morphology • Ion mobilization • Calcium Influx • Nitric oxide production • Real-time observation of cultures • Short duration studies (15-20 min)	
No. of chambers	1	1	8	6	1	1
Chamber size-culture surface area	4 cm^2	10 cm^2	4 cm^2	10 cm^2	1 cm^2	4 cm^2
Stretch Type	Uniaxial stretch		Uniaxial stretch		Uniaxial stretch	Biaxial stretch
Microscope mountable	N/A	N/A	No	No	Fits Nikon and Olympus	Fits Nikon and Olympus
Incubator compatibility	Fits in standard incubator		Fits in standard incubator		Fits in standard incubator	
No. stretch patterns	None, manual	None, manual	Automated 64 patterns	Automated 64 patterns	Automated 64 patterns	Automated 64 patterns



Manual Stretch Systems

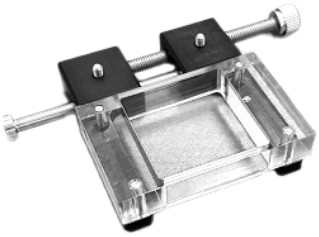


Manual uniaxial stretch device, for 4 cm² chambers

ST-0040

Chamber compatibility: SC-0040, SC-1035, SC-1040, SC-1044

Great for piloting a uniaxial stretch project and testing adhesion methods, stretch extents, and staining protocols. Supports 1 chamber.



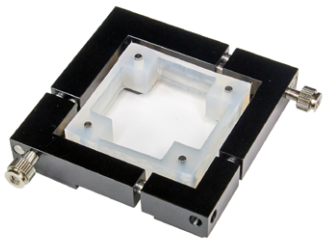
Manual uniaxial stretch device, for 10 cm² chambers

ST-0100

Chamber compatibility: SC-0100, SC-0044

Max. dimensions (cm): 7.0 x 6.0 x 1.2

Great for piloting a uniaxial stretch project and testing adhesion methods, stretch extents, and staining protocols. Supports 1 chamber.



Manual biaxial stretch device

ST-0042

Chamber compatibility: SC-0042

Max. dimensions (cm): 7.1 x 7.1 x 1.9

Great for piloting a biaxial stretch project and testing adhesion methods, stretch extents, and staining protocols. Supports 1 chamber.

Automated Stretch Systems

Automated uniaxial stretch device, for 4 cm² chambers

ST-1440

Chamber compatibility: SC-0040, SC-1035, SC-1040, SC-1044

Dimensions (cm): 27.0 x 24.0 x 13.0 (stretch unit), 32.0 x 22.0 x 13.0 (controller unit)

Great for high-throughput, parallel uniaxial stretching of up to 8 x 4 cm² chambers. Ideal for the standard incubator.

Automated uniaxial stretch device, for 10 cm² chambers

ST-1400

Chamber compatibility: SC-0100, SC-0044

Dimensions (cm): 27.0 x 24.0 x 13.0 (stretch unit), 32.0 x 22.0 x 13.0 (controller unit)

Great for high-throughput, parallel uniaxial stretching of up to 6 x 10 cm² or 4-well chambers. Ideal for the standard incubator.

Automated uniaxial stretch device, for 10 cm² chambers, with electrical stimulation

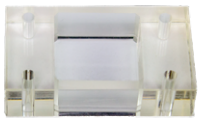
ST-1410

Chamber compatibility: SC-0100, SC-0044

Dimensions (cm): 27.0 x 24.0 x 13.0 (stretch unit), 32.0 x 22.0 x 13.0 (controller unit)

Great for high-throughput, parallel uniaxial stretching of up to 6 x 10 cm² or 4-well chambers while stimulating with electrical pulses. Ideal for the standard incubator.

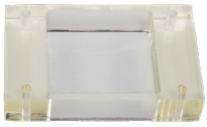
Manual and Automated System Stretch Chambers



4 cm² stretch chamber

Model #: SC-0040

Dimensions (cm): 2.0 x 2.0 x 1.0 | System compatibility: ST-0040, ST-1440



10 cm² stretch chamber

Model #: SC-0100

Dimensions (cm): 3.2 x 3.2 x 1.0 | System compatibility: ST-0100, ST-1400, ST-1410

4-well stretch chamber

Model #: SC-0044

Dimensions (cm): 1.6 x 1.6 x 1.0 | System compatibility: ST-0100, ST-1400

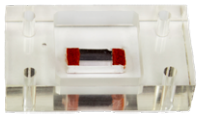
4 cm² culture stretch chamber, with pips

Model #: SC-1040

Dimensions (cm): 2.0 x 2.0 x 1.0 | System compatibility: ST-0040, ST-1440

Features: Culture medium stabilizing pips

2 cm² culture stretch chamber, with sponges

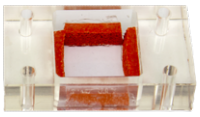


Model #: SC-1035

Dimensions (cm): 1.0 x 2.0 x 1.0 | System compatibility: ST-0040, ST-1440

Features: Culture medium retention silicone sponge

4 cm² culture stretch chamber, with sponges

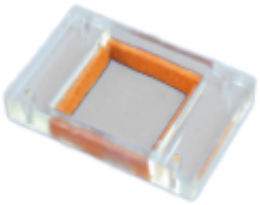


Model #: SC-1044

Dimensions (cm): 1.3 x 1.3 x 1.0 | System compatibility: ST-0040, ST-1440

Features: Culture medium retention silicone sponge

10 cm² culture stretch chamber, with sponges



Model #: SC-1014

Dimensions (cm): 2.5 x 2.5 x 1.0 | System compatibility: ST-0100, ST-1400

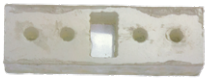
Features: Culture medium retention silicone sponge

Short tissue stretch chamber

Model #: SC-0060

Dimensions (cm): 1.0 x 0.6 x 1.0 | System compatibility: ST-0040, ST-0100, ST-1440, ST-1400 | Features: Tissue stabilizing notches

Long tissue stretch chamber

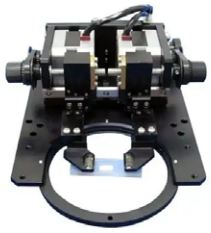


Model #: SC-0015

Dimensions (cm): 1.5 x 1.0 x 1.5 | System compatibility: ST-0100, ST-1400

Features: Tissue stabilizing notches

Microscope-Mountable Stretch Systems



Automated microscope-mountable uniaxial stretch device

ST-1500

Chamber compatibility: SC-0022, SC-0024

Dimensions (cm): 17.7 x 19.1 x 6.1 (stretch unit), 25.8 x 18.0 x 10.7 (controller unit)

Great for short, 15-20 minute uniaxial stretching with real-time microscopic imaging of stained cells and tissue. 64 preprogrammed automated stretch patterns.

Automated microscope-mountable biaxial stretch device

ST-1900

Chamber compatibility: SC-0042

Dimensions (cm): 16 x 17.4 x 5.5 (stretch unit), 32.0 x 22.0 x 12.7 (controller unit)

Great for short, 15-20 minute biaxial stretching with real-time microscopic imaging of stained cells and tissue. 64 preprogrammed automated stretch patterns.

Microscope-Mountable System Stretch Chambers

Shallow microscope-mountable stretch chamber

Model #: SC-0022

Dimensions (cm): 1.0 x 1.0 x 0.2 | Compatibility: ST-1500

Deep microscope-mountable stretch chamber

Model #: SC-0024

Dimensions (cm): 1.0 x 1.0 x 4.0 | Compatibility: ST-1500

Biaxial microscope-mountable 4 cm² stretch chamber

Model #: SC-0042

Dimensions (cm): 2.0 x 2.0 x 1.0 | Compatibility: ST-0042, ST-1900

Stretch System Accessories

Pulse generator system for electrical stimulation

Model #: SE-0050

System compatibility: ST-1410

Stimulate cells with [] while they are stretched uniaxially.

Cover glass applicator

Model #: SP-1500

System compatibility: ST-1500

Apply glass slides to the bottom of your stretch chamber to minimize friction when stretching and maintain chamber rigidity. A gap (200 μm) between the slides is ideal for cell seeding for single-cell microscope observation during uniaxial stretch.

Strex USA

www.strexcell.com

Telephone: +1 (866) 844-4374

Email: info@strexcell.com

Address: 10060 Carroll Canyon Rd.
Suite 100
San Diego, CA, USA, 92131

Strex Japan

www.strex.co.jp

Telephone: +81 6-6131-9602

Address:
1-8-34 Oyodo, Kita-ku
Osaka, Japan
531-0076