

# ShellPa

## **Mechanical Cell Stretch System**



## What is the Mechanical Cell Stretch System?

When walking or running, the internal structure of the body experiences various mechanical stresses such as muscle movement, heart pulsation or skin tension while smiling. These mechanical stresses are closely related to cell proliferation and differentiation or tissue degeneration and development. Additionally, disease processes such as osteoporosis, cancer metastasis, skin disorders and muscle degeneration share a loss of tissue structure, integrity and mechanical transduction.

The Mechanical Cell Stretch System, "ShellPa" is an instrument for cell culturing that has been developed in order to replicate a dynamic environment inside the human body.

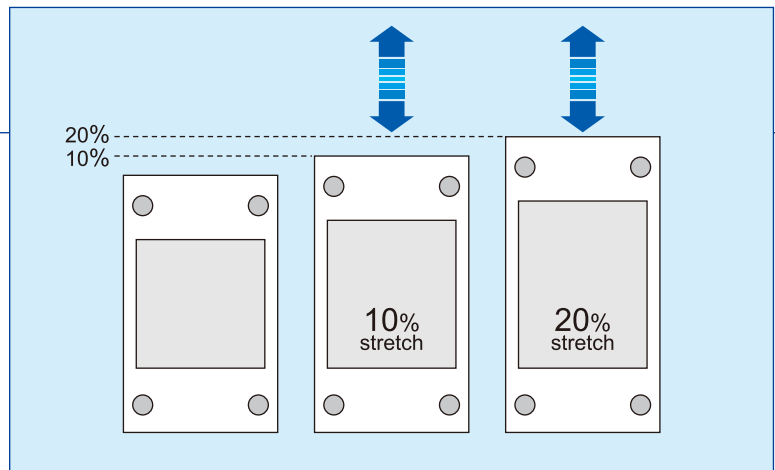
This system is pneumatically driven by an air compressor. It is expected that cell culturing under the mechanical stress provided by this system can bring more biologically and physiologically realistic cell responses compared to a conventional static cell culturing without mechanical stress.

Moreover, the stretch frequency and stretch ratio (stretch pattern) are easily controllable, according to each experimental situation.

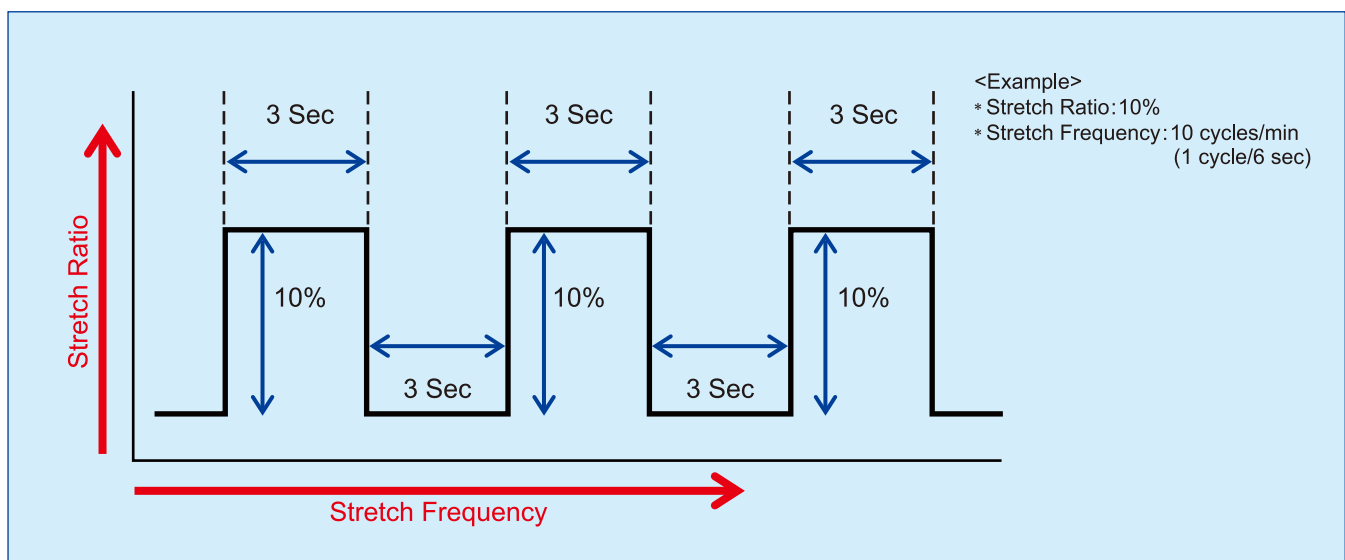
The Stretch Chamber made with silicone (PDMS=polydimethylsiloxane) can be used for this system after being coated (e.g. fibronectin, collagen).

## System Features

- Lightweight & compact  
(Installable to a laboratory incubator)
- Stretch frequency: 1-120 cycle(s)/min
- Stretch ratio: 2, 4, 5, 6, 8, 10, 12, 15 and 20%
- Stretch in a square wave pattern
- Workable with 6 stretch chamber at one time
- Removable stretch chambers holder
- Indication of accumulated operation time



## Wave Pattern



# Operation of ShellPa



**1** Pre-culture cells in the chambers.



**2** Set the stretch ratio (2, 4, 5, 6, 8, 10, 12, 15 or 20%)



**3** Place the chambers onto the chamber holder.



**4** Load the chamber holder back into the main unit (installed in the incubator).



**5** Turn the dial of the controller to set the stretch frequency (1-120 cycles/minute).



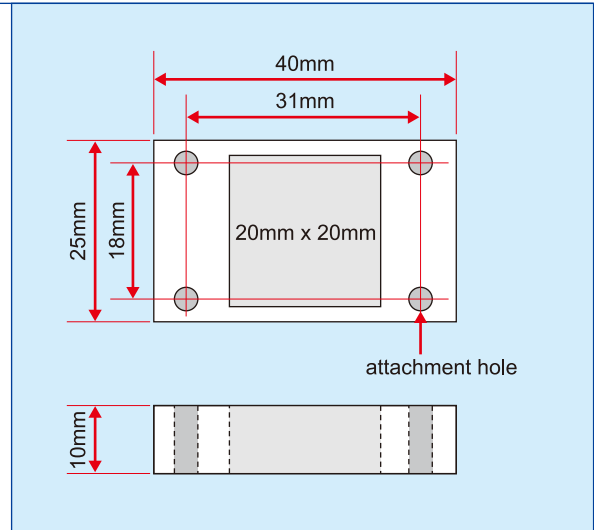
**6** Press the start/stop switch to start stretching.

# Stretch Chamber

- High elasticity & restorative ability
- Material: silicone (PDMS=polydimethylsiloxane)
- Observable through its extremely-thin (0.4mm) & light microscope, fluorescence microscope, confocal laser scanning microscope
- Disposable

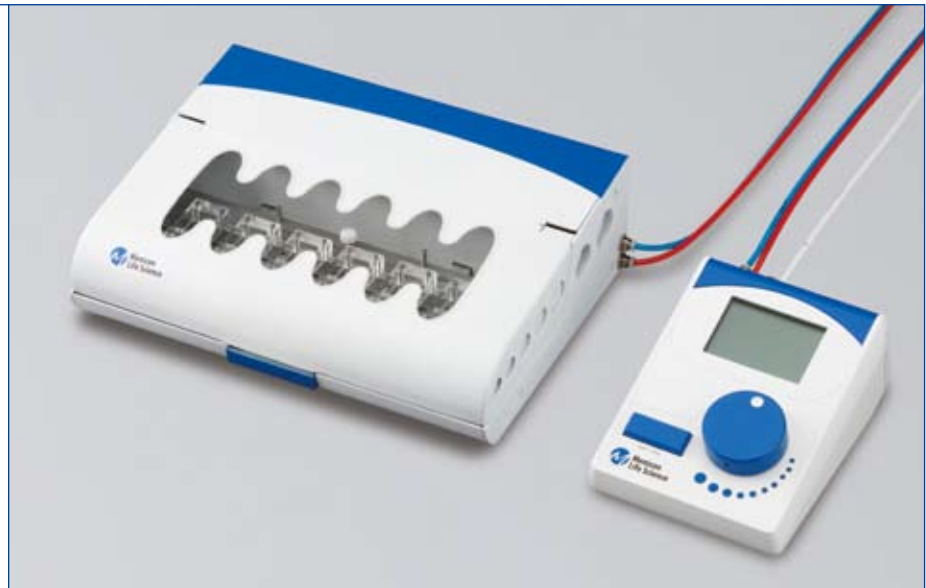
※ Needs to be coated  
(e.g. fibronectin, collagen) before using.

Size of Cell Culturing  
Area (Bottom): 20mm × 20mm



# System Configuration

1. Main Unit & Controller
2. Stretch Chamber
3. Air Compressor  
(※JUN-AIR)  
※Recommended



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