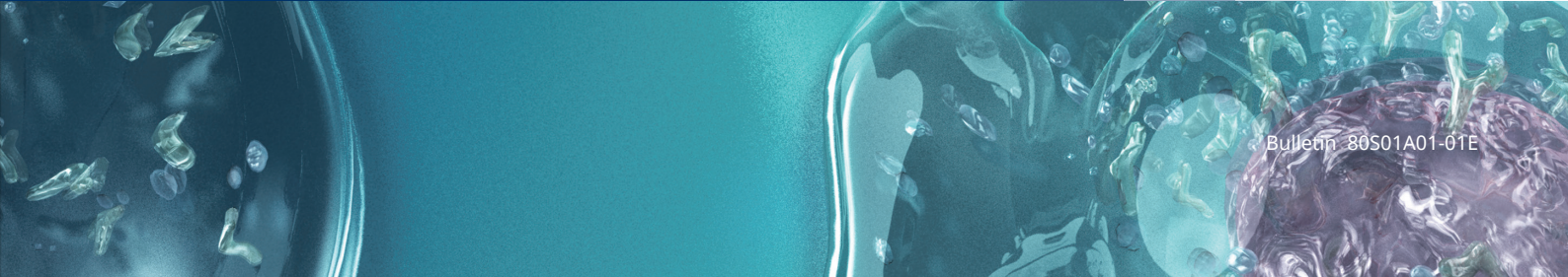
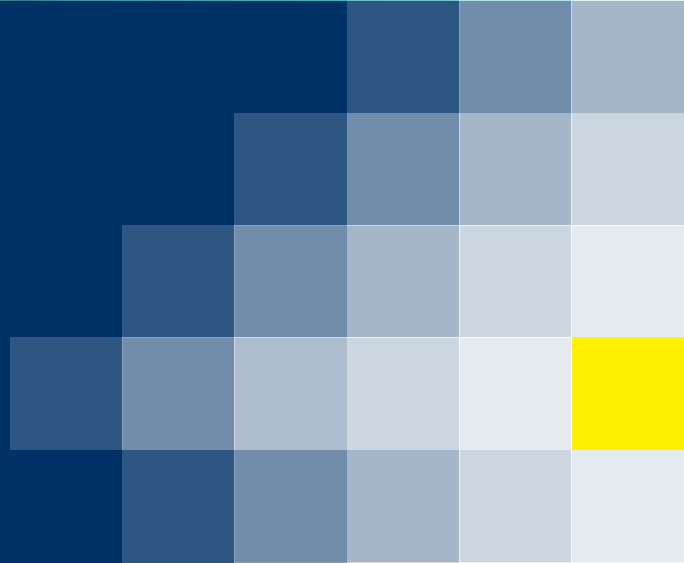


Single-cell Analysis Solution

Single Cellome™ Unit  
SU10

Nano-point Delivery





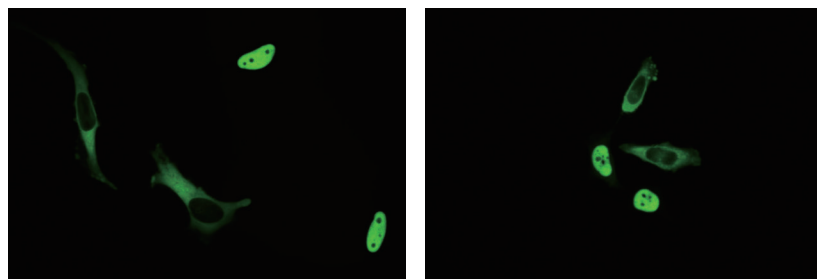
# Single Cellome™ Unit SU10

## Single-cell Targeting With Direct Delivery Into Nucleus Or Cytoplasm

Select cells for delivery while observing under a microscope.

- XY-position: Easy Control
- Z-position: Automatic control of delivery position in software\*

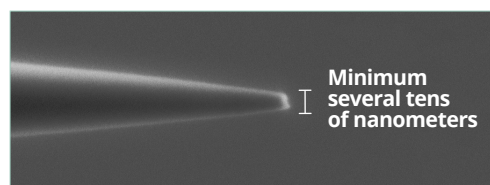
\* Partial manual operations are required.



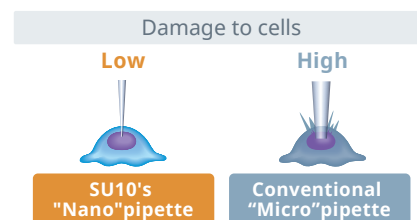
FITC-labelled dextran solution (molecular weight 70,000) was delivered into HeLa cells

## Minimal damage to cells

The nanopipette is a glass pipette with minimum tip outer diameter of several tens of nanometers



The tip of the nanopipette under an electron microscope



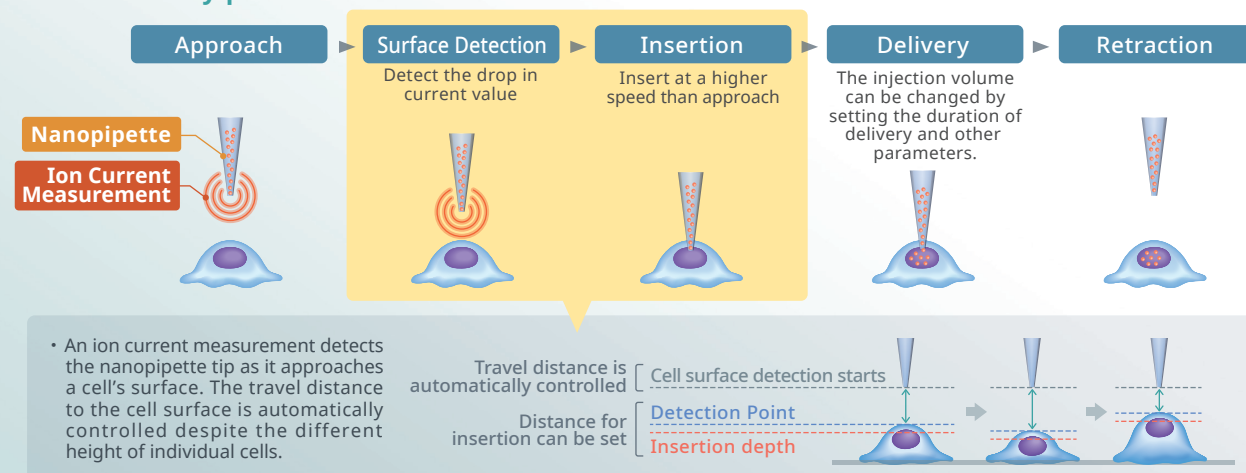
## Automated, High Speed, and High Success Rate

The SU10 uses automated cell surface detection, insertion, and delivery to the cell.

The process takes approximately 10 seconds with a 90% success rate.\*

\* Experiment by Yokogawa

### – Nano delivery process



## High success rate of materials delivered to cells

### Cells

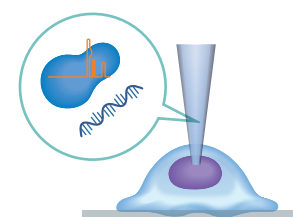
- Cell line (HeLa, HEK293, CHO, etc.)
- Primary cell culture (Hepatocyte, etc.)
- Stem cell lines (ES cell, etc.)
- Immune cell lines (T cell, Ba/F3 cell, etc.)

### Examples of materials that can be injected

- Cas9 protein-sgRNA complex
- Protein (Cas9, GFP, etc.)
- Nucleic acid (single-stranded DNA, etc.)
- Fluorescent reagent

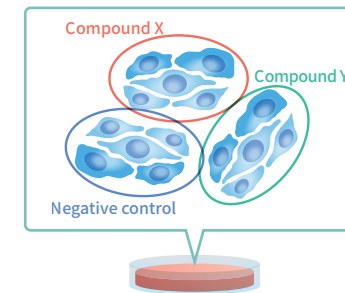
## Application Example

### Delivery of genome editing tools directly into the nucleus

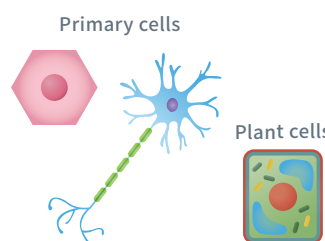


**Application note** A knockout efficiency of over 70% in HeLa cells\*1

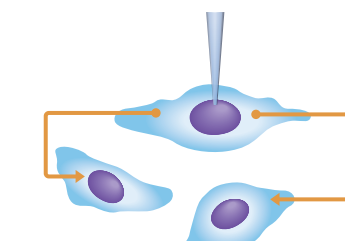
### Efficacy/toxicity evaluation of drug candidate molecules



### Delivery into cells that cannot be introduced by conventional methods



### Analysis of cell-cell communication starting from the injected cell



\*1: Experiment by Kamakura Research Group, Department of Applied Biological Science, Faculty of Science and Technology, Tokyo University of Science

\* Function to collect intracellular substances is under development

## FAQ

### What is the max volume to deliver into cell?

It is estimated to be tens of femtoliter (fL) per second (1fL=1x10<sup>-15</sup>L). The volume can be changed by software settings.

\*The delivery volume may vary depending on the solute and vehicle.

### Is the nanopipette disposable?

Yes, but one nanopipette can deliver to 50 cells or more\*.

\*Experiment using HeLa cells by Yokogawa

### How does the SU10 differ from traditional transfection methods?

The SU10 can deliver materials into the selected cells. The SU10 enables a direct delivery of reagents into cytoplasm or nucleus.

### What is the difference from electroporation?

In addition to the above-mentioned "difference from traditional transfection methods", due to automated cell surface detection, the suspension of cells is not required during injection.

### What is the difference from microinjection?

The SU10 lowers the damage to a cell with the nanopipette because its tip size is less than 1/10 of a tip used for microinjection.

Automatic detection of cell surface enables a high success rate of insertion and insertion to the intended depth of a cell.

The delivery operation uses an electrical mechanism rather than pneumatic or hydraulic pressure.

# Specification

Actuator Module	Coarse movement (Motor actuator)	Stroke: Approx.50mm/axis (setting resolution XYZ axis: 0.625μm)
	Fine movement (Piezo actuator)	Stroke: 100μm/axis (setting resolution XYZ axis: 10nm,at penetration and extraction: 1nm)
Measurement Module	Voltage generation range	-10V~+10V (setting resolution: 10mV)
	Current measurement range	-900nA~+900nA (setting current range: ±9V)
Power supply	Power consumption (Main controller+Piezo controller)	100VA or lower
	Supply Voltage (Main controller)	100~120V/220~240VAC (Switching not required)
	Supply voltage (Piezo controller)	100~120V/220~240VAC (model must be specified when placing an order)
	Power supply frequency (Main controller+Piezo controller)	50/60 Hz
External dimensions and weight	Main controller	260(W) x 99(H) x 280(D) mm, Approx. 2.8kg
	Piezo controller	236(W) x 88(H) x 273(D) mm, Approx. 4.6kg
	Actuator module	270*(W) x 219(H) x 245*(D) mm, Approx. 2.2kg * In case the X and Y axes move in the direction of the maximum distance
	Measurement module	85(W) x 30(H) x 43(D) mm, Approx. 0.1kg
	Joystick	100(W) x 145(H) x 144(D) mm, Approx. 0.3kg
	Safety guard	130(W) x 230(H) x 287(D) mm, Approx. 0.7kg
	Tip outer diameter of nanopipette (in case of SU10ACC-NP01)	Under 100nm (reference value)
Operation Environment	15 to 35°C, 20 to 70%RH No condensation, altitude up to 2000m	
Microscope compatibility	For use with an inverted optical microscope.* Microscope is not included with the SU10. Please contact Yokogawa to possibly install the SU10 on a different inverted microscope. Installation examples: Olympus IX71, Olympus IX83, Nikon Ti2	

## ■ Installation example

- The SU10 does not come with an optical microscope.
- Depending on the microscope, the condenser may have to be removed when using the SU10.
- Bright field imaging, fluorescence imaging, and operation of the motorized stage are still possible.



**Contact us for more information and demonstration requests**

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