C297-E127B

SHIMADZU
Excellence in Science

Automated Picking and Collecting of Cell Colonies

CELL PICKER

Pickup and Remove Cell Colonies with Complete Freedom

The CELL PICKER™ system automates the pickup and removal of cell colonies using a pipetter. Easy-to-operate software simplifies the cell pickup process.
Cell pickup can be made even easier by connecting AUTO CHANGER, new optional equipment designed with automation in mind.

Stress-Free Operations P.3-5 >

Unstable and delicate procedures during cell pickup are automated, so the operator can focus on the cell selection process. The software is simple to operate.

Ensuring Traceability P.6-8 >

Procedural control and standardization are ensured by methods (procedural conditions). In addition, images of the cells can be recorded automatically before and after pickup.

CELL PICKER System Equipped with AUTO CHANGER

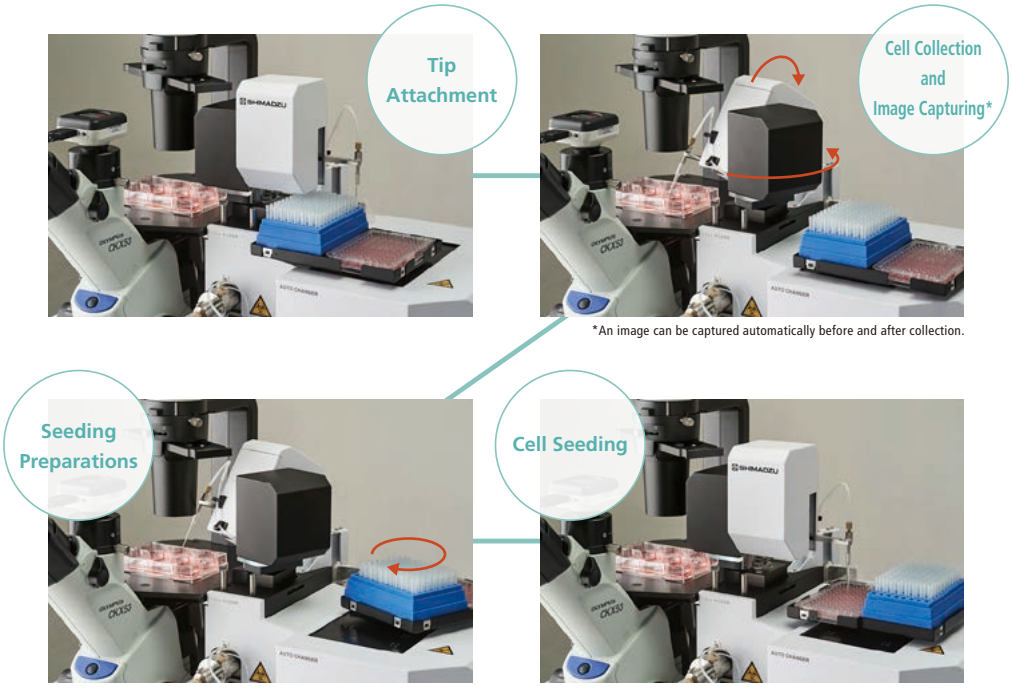
Main Applications

- Construction of cell strains (genome editing cells, iPS cells)
- Recovery of spheroids

Stress-Free Operations

In Pursuit of Automation AUTO CHANGER

In addition to cell colony pickup, using the optional AUTO CHANGER automates related procedures, including the installation of tips directly from the rack, transfer of the seeding plate, and linkage of the seeded wells with images of the cells collected.



*An image can be captured automatically before and after collection.

Check the video to see how CELL PICKER works.

This shows the steps that can be automated using CELL PICKER on its own or with the AUTO CHANGER. System configuration can be selected according to the steps you want to automate.

Manual Steps	CELL PICKER+AUTO CHANGER	CELL PICKER
Moving the cultivation vessel and searching for cells	No	No
Determining a target	No	No
Attaching a tip to the pipetter	Yes	Partially Supported
Collecting cells	Yes	Yes
Determining the seeding positions	Yes	No
Seeding	Yes	Yes
Discarding the tip	Yes	Yes

Loaded one at a time manually

Transferred one well at a time manually

Note: AUTO CHANGER This logo indicates a feature of systems equipped with AUTO CHANGER.

Achieves Picking Results Comparable to Manual Processing

Do you have problems with the difficult and unstable procedures during the picking process?
By automating cell collection, seeding, and pipette tip replacement, CELL PICKER stabilizes the operations of picking up and removing cell colonies, processes typically reliant on an operator's skill level. Using the easy-to-operate software, images of the cells can be automatically obtained before and after collection.

Manual Operation

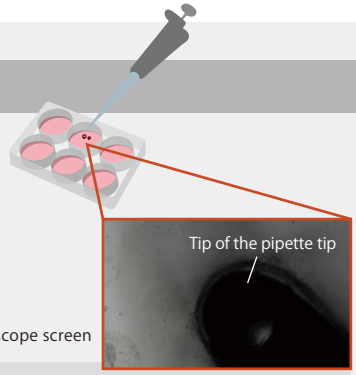
Search colonies

- The cultivation vessel is moved.
- The user searches under the microscope for the cell colonies to be collected, and then marks them with a pen.

- ✕ Marking the back of the vessel while looking through the microscope is difficult.
- ✕ Capturing images one after the other is difficult.

Targeting

The user operates the pipetter under the microscope, repeatedly picking up the marked colonies while replacing the pipette tip for each colony.



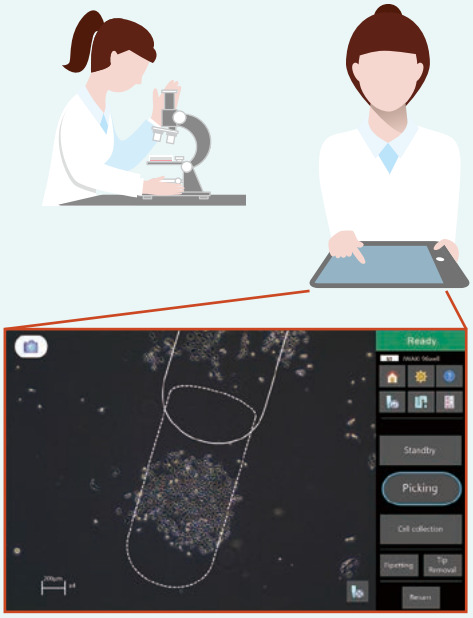
Example of a microscope screen

- ✕ Hand tremors make position adjustments difficult, leading to instability.
- ✕ The process takes a long time to master.
- ✕ Working while looking through a microscope for an extended time leads to fatigue.

CELL PICKER + AUTO CHANGER

Search colonies

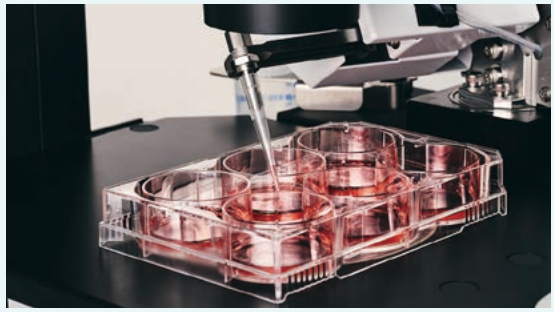
- The cultivation vessel is moved.
- Using the software, the cell colonies to be collected are found and the operating conditions (methods) are selected.



Operation Window

Targeting

An image can be captured automatically before and after collection.



Collection

Stable Operations

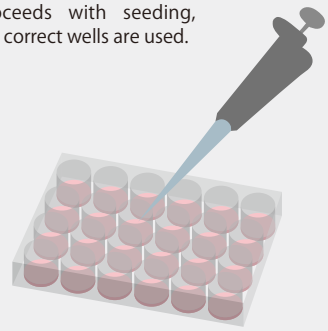
Cells can be collected without relying on an operator's skill level.

Simple Operations

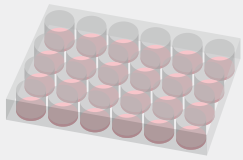
To operate, just tap the buttons while viewing the image in the microscope window.

Seeding

The user opens the lid of the seeding vessel and proceeds with seeding, ensuring that the correct wells are used.



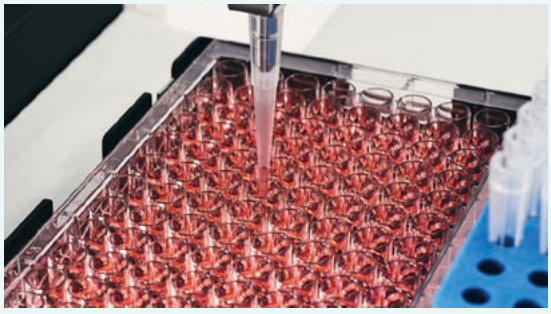
Work Records



✕ No record is kept of what cell colonies were collected.

Seeding

- The seeding location moves and the collected cells are automatically seeded.
- The used tip is discarded.

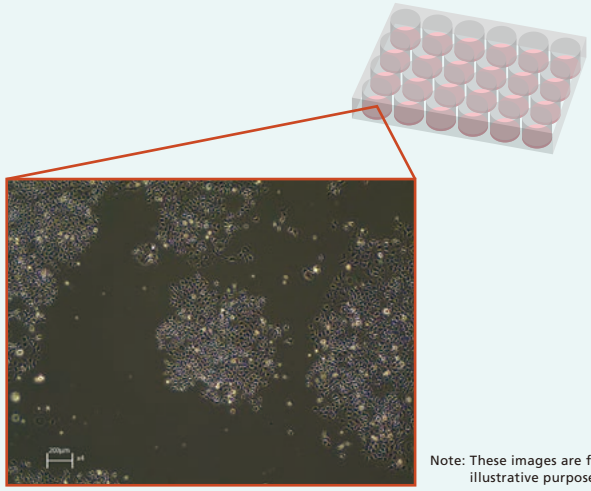


Error Prevention AUTO CHANGER

The wrong wells are never seeded.

Work Records

Images can also be captured, so records of which cell colonies were collected can be checked.



Note: These images are for illustrative purposes only.

Obtaining Seeding Records AUTO CHANGER

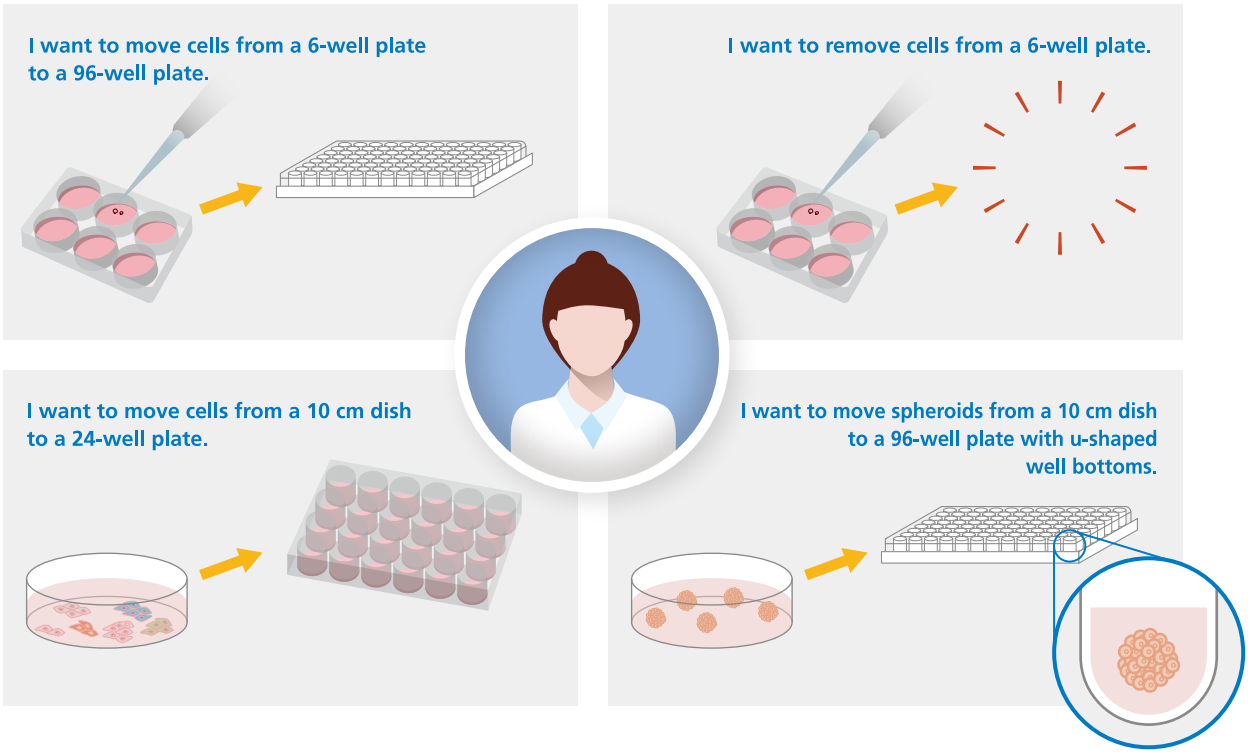
The seeded well numbers can be automatically associated with images of the cells collected.

Note: AUTO CHANGER This logo indicates a feature of systems equipped with AUTO CHANGER.

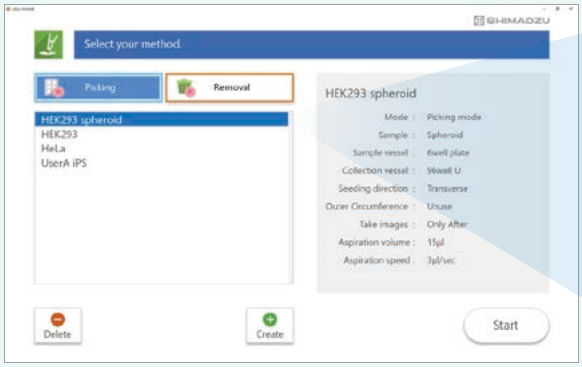
Ensuring Traceability

Standardization of Procedures Using Methods

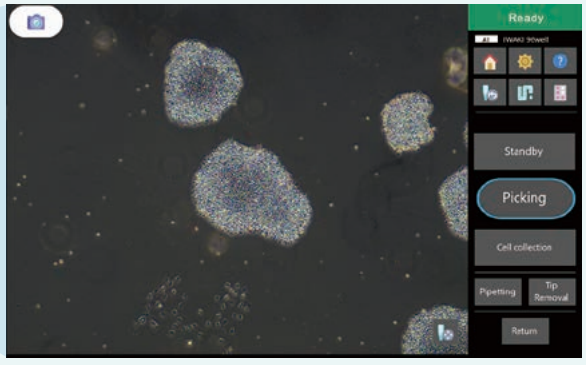
CELL PICKER operates in accordance with pre-configured methods. With methods, the applicable cell type and type of vessel to use can be configured, enabling support for a variety of cultivation and testing conditions. Methods can be saved, so procedures utilizing the same conditions time can be implemented at any time.



When the method created is selected from the list, the operation window is immediately displayed.



Home Window

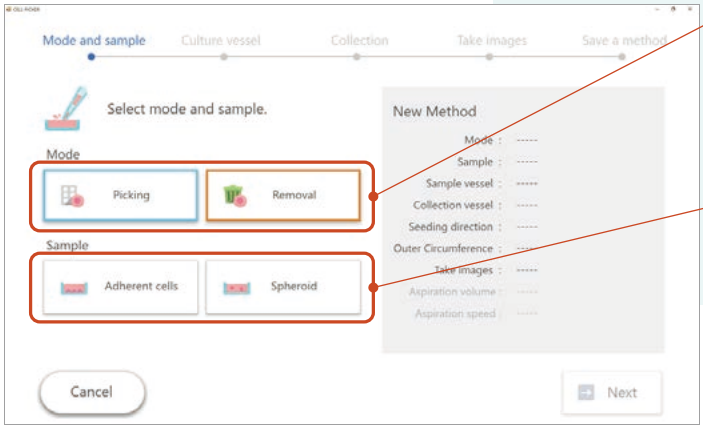


Operation Window

Setting Items Sample (adherent cells or spheroids), Mode (picking or removal), Sample vessel, Seeding vessel, Automatic image capture ON/OFF

Mode and Sample Setting Window

The user can select the cell type and the mode to use.



Two operating modes can be selected.

Picking Mode The required cells are seeded into a cultivation container.

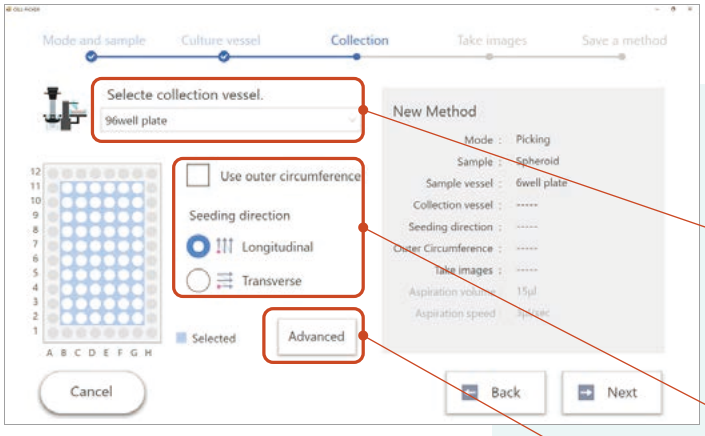
Removal Mode Unnecessary cells are discarded.

Adherent cell or spheroid can be selected as the cell type.
The scraping process switches over to suit the cells targeted.

Setting Window When AUTO CHANGER Is Attached

AUTO CHANGER

The user can configure the type of seeding vessel as well as the seeding position and seeding direction.



The user can select the vessel for seeding.
Up to eight cultivation vessels can be registered and selected separately by manufacturer and incubation vessel.

with AUTO CHANGER 8 seeding vessels you normally use can be registered.

CELL PICKER "96well plate" or "other multi plate"*

*Petri dish is not supported.

The seeding position (outer circumference Y/N) and seeding direction can be selected.

The seeding position can be configured in as small as one-well increments.

Note: AUTO CHANGER This logo indicates a feature of systems equipped with AUTO CHANGER.

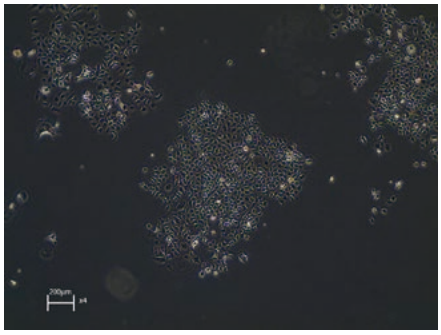
Effortless Procedural Records

Procedures can be checked and recorded without burdening the operator due to functions that automatically take images, link the image name and operating conditions, and check the seeding conditions.

Images of Cellular Colonies Can be Obtained before and after Collection Using the Automatic Imaging Function

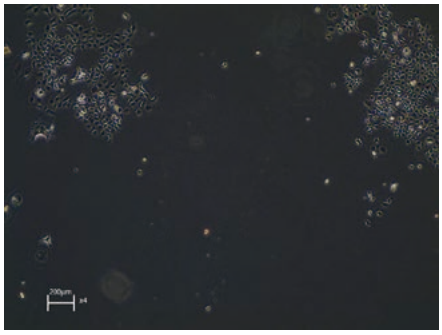
Images acquired automatically are saved with the name formatted as "date_time_serial number_well number*_before/after." In addition, summary files are output in which the operating conditions are linked with the image names.

Before Collection



20201110_1607_021_C2*_before

After Collection



20201110_1607_022_C2*_after

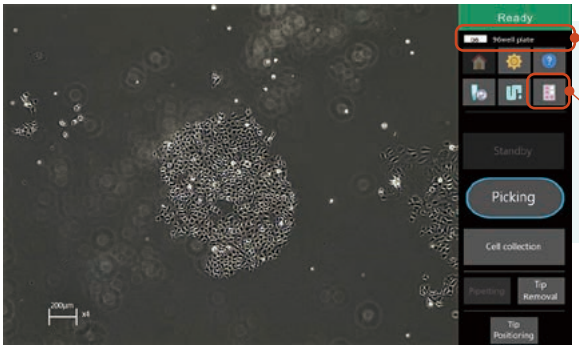
Summary File Example

No.	Image Name	Method Name	Mode	Sample	Sample Vessel	Collection Vessel*	Well No.*	Volume	Speed
21	20201110_1607_021_C2_before	HEK_picking	Picking	Adherent	6well plate	96well plate	C2	5 µL	16 µL/sec
22	20201110_1607_022_C2_after	HEK_picking	Picking	Adherent	6well plate	96well plate	C2	5 µL	16 µL/sec

*Output only by systems equipped with AUTO CHANGER

AUTO CHANGER

Checking the Seeding Well Information and the Progress of the Seeding

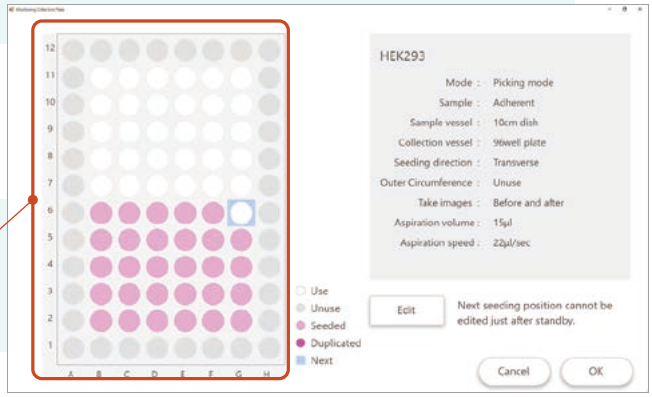


Main Window

The user can check the well numbers and the seeding vessel information.

The progress of the seeding process can be checked.

The user can check the seeded wells and change the scheduled seeding positions. The same well can be seeded multiple times.



Seeding Status Monitor Window

Note: AUTO CHANGER This logo indicates a feature of systems equipped with AUTO CHANGER.

Picking Applications Using CELL PICKER

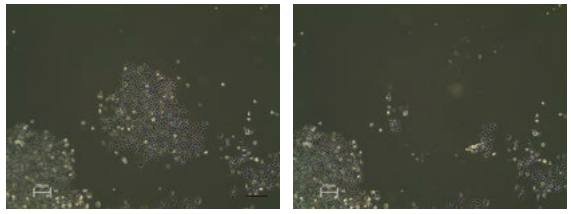
This section describes examples of the pickup of various cells. Each process can be implemented by the CELL PICKER unit, but it is simpler if the system is equipped with AUTO CHANGER.

Cell Line Colony Picking

CELL PICKER can be used in the process of acquiring adherent cells. This section introduces an example of picking an HEK293 cell colony. HEK cells were seeded into a 10 cm dish with 1.8 × 10^4 cells and cultivated for 13 days. Using CELL PICKER equipped with AUTO CHANGER, picking was performed to ensure one colony per well on a 24-well plate. After the picking process, it was confirmed that the cells proliferated without problems.

Schematic of the Processing Sequence

Images before and after Collection, Acquired with the CELL PICKER Automatic Image Capture Function

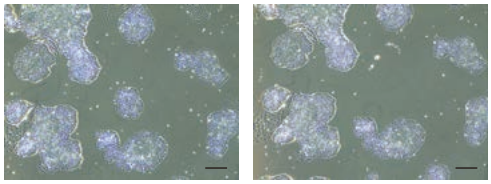


Before Collection | After Collection

Pick Up an iPS Cell Strain

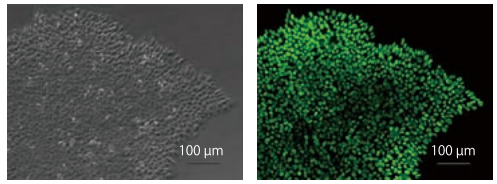
Picking up an iPS cell strain colony (strain 1231A3) maintained in culture is implemented with CELL PICKER. The cells were cultivated for 6 days after the cell pickup process. They were then immobilized and immunostaining was performed. Expression of the undifferentiated markers Oct3/4 and Tra-1-60 was confirmed. In this way, the iPS cell colony picked up using CELL PICKER was maintained in an undifferentiated state and could evidently be cultured continuously.

Before and After Cell Pickup



Before Cell Pickup | After Cell Pickup

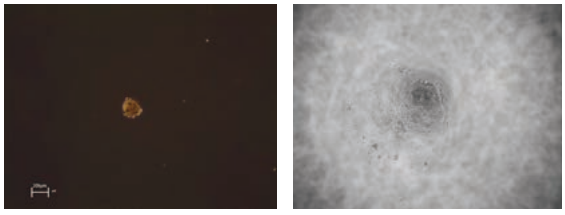
Results of Immunostaining



Phase Contrast Microscope | Oct3/4

Spheroid/Organoid Picking

About 30 spheroids per well were prepared to a 6-well plate. CELL PICKER equipped with AUTO CHANGER was used for cell picking to ensure one cell per well on a 96-well plate. The 96-well seeding plate was coated with a 0.1 % gelatin solution and a 100 µL/well culture medium was dispensed beforehand.



Before Collection
(Acquired with the CELL PICKER Automatic Image Capture Function)

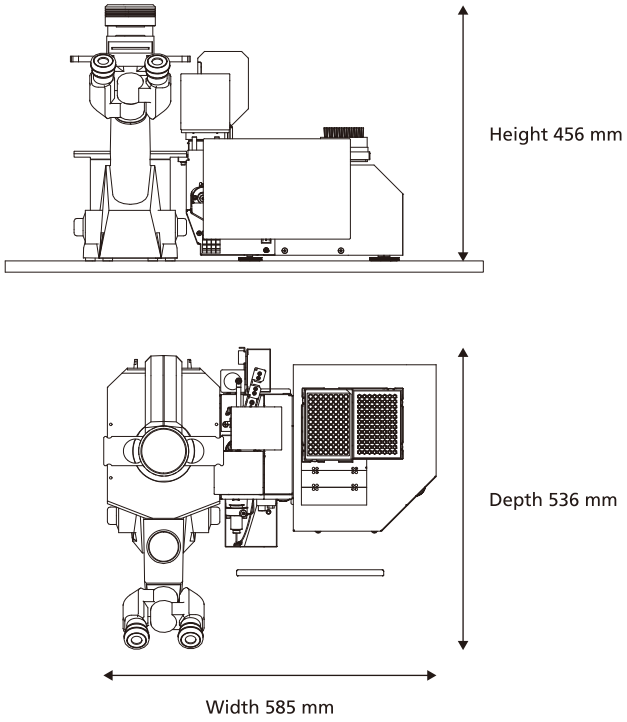
Second Day of Cultivation after the Picking Process

Specifications

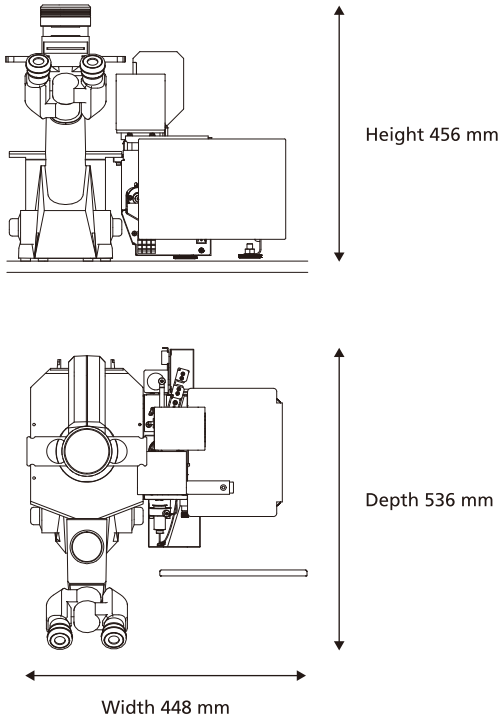
	CELL PICKER＋AUTO CHANGER	CELL PICKER
Recommended Microscope	Olympus CKX™53	
Number of Vessels that can be Registered for Picking	Up to 8 Note: The only supported multi-well plates are 6-well plates.	
Number of Vessels that can be Registered for Seeding	Up to 8 Note: Not dishes however.	None
Automated Seeding	Yes	No
Recommended Pipette Tip (for 200 µL)	Manufacturer: QSP (Thermo Fisher Scientific) Model: TW110-96RNS-Q	
Suction amount	Picking mode: 5/10/15 µL Removal mode: 5 µL	
Weight	15.5 kg (AUTO CHANGER: 7 kg)	8.5kg
Size (not including microscope)	W 585 mm×D536 mm×H456 mm (W 385 mm×D355 mm×H372 mm)	W 448 mm×D536 mm×H456 mm (W 248 mm×D355 mm×H372 mm)
Power Supply	100 to 240 V AC, Frequency: 50/60 Hz, Power consumption: 75 VA	
Environment	Operating temperature: 10 to 35 °C Operating humidity: 20 to 85 %RH	

Installation examples

CELL PICKER with AUTO CHANGER



CELL PICKER



Related Item

Desktop Clean Bench dedicated for CELL PICKER (PCV-801TP-S3)

Special clean bench that can be loaded on a laboratory desk.

- Ideal size for CELL PICKER.
- Utilize CELL PICKER easily due to adoption of a slide table.
- Fun Filter Unit maintains cleanliness when opening the front shutter.

Specifications

Size:	Outside Diameter W740 mm × D650 mm × H890 mm Inside W690 mm × D520 mm × H605 mm
Air flow system:	Vertical air flow system
Room cleanliness:	ISO Class 4
Elements of dust-collecting:	Pre-filter + HEPA filter
Air flow:	6.4 m^3 / min ± 20%
Power Supply:	65 W
Weight:	Approximately 75 Kg
Note:	Slide table, Internal plug × 4

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