High-throughput Cytological Discovery System

Cell Voyager   CV7000

In the pharmaceutical industry, the use of drug discovery support systems has been expanding to facilitate the screening of hundreds of thousands or even millions of compounds for promising drug candidates. A drug discovery support system automates the processes of administering compounds to cells, imaging changes in the cells, analyzing the obtained images, and verifying the effects of the administered compounds.

Drug discovery support systems are required to have high throughput to rapidly test a large number of compounds. To meet the needs, Yokogawa has released the CellVoyager CV7000 featuring significantly improved throughput with wide-view, high-resolution imaging.


CellVoyager CV7000

FEATURES

■ Industry-leading throughput for imaging

By improving Yokogawa's unique microlens-enhanced Nipkow disk confocal technology and combining a newly developed wide-view confocal optical mechanism with a high-resolution sCMOS camera, the CV7000 has achieved the highest image quality in the industry, beating our previous record holding models. The CV7000 also features a four times larger imaging area, thus taking only four minutes to obtain images of 384 wells in the plate while previous models took 16 minutes.

CV7000

Four times larger image area Clearer image
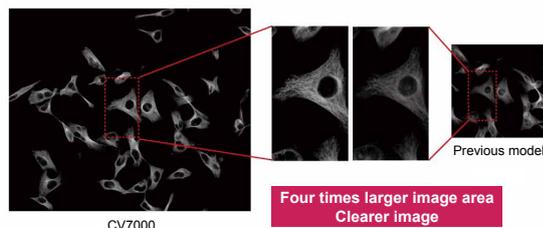
Previous model

Comparison of image areas of
the CV7000 and the previous models

■ Stage incubator ideal for live cell imaging

For observing live cells over a long period, the CV7000 can control the ambient environment (temperature, humidity, CO_2 concentration) of the moving stage on which cell culture plates are mounted.

■ Enhanced functions for the automated system

An interface for external robot systems has been enhanced to load/unload cell culture plates from/to external devices such as incubators, and a bar-code reader has been added to automatically handle a large number of plates.

■ High-speed analysis software

The analysis software, supporting multi-core CPUs, runs up to 10 times faster than that of our previous models. Image data management software for managing a large amount of image data is available as an option.

SPECIFICATIONS

■ Applicable well plates:
6, 24, 96, 384, and 1536 wells

■ Optical system
Confocal system: Nipkow disk with microlens array
Excitation laser wavelength: 405, 488, 561 (or 532), 640 nm
Objective lens: 4× to 60× (water immersion, long working distance)
Camera: High sensitivity sCMOS camera (up to 3 cameras)

■ Environment control for stage incubator (option)
Temperature range: 35 to 40°C
Humidity control: Water bath humidifier (forced type)
CO_2 concentration: 5%
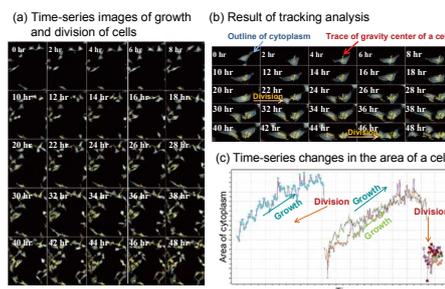
■ Output data format:
Image: 16-bit TIFF and PNG
Numerical data: CSV, original format

APPLICATIONS

The CellVoyager CV1000 can easily conduct advanced tests as shown below.

(a) Time-series images of growth and division of cells
(b) Result of tracking analysis
Outline of cytoplasm   Trace of gravity center of a cell
(c) Time-series changes in the area of a cell

Long-term imaging of cell division and results of analysis

Contact us:
To Yokogawa Japan:
http://www.yokogawa.com/scanner
E-mail: csu_livecell_imaging@cs.jp.yokogawa.co.jp
For worldwide locations, please see the back cover.

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