

High-throughput Cytological Discovery System

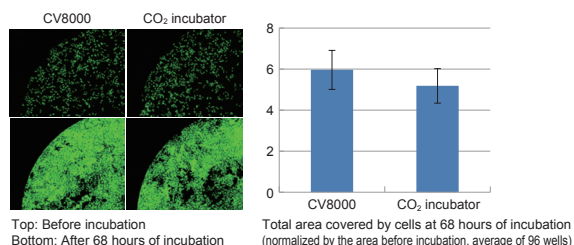
Cell Voyager CV8000

In the field of new drug discovery, the high content analysis (HCA) system is becoming popular for screening several hundred thousand compounds to identify promising candidates for new drugs. In HCA, cells are imaged with a microscopic camera, and their temporal changes are analyzed. To observe biological changes in living cells and identify the effect of the candidate compounds, it is necessary to observe living cells for a long time. Also, there is an increasing need to eliminate the effect of fluorescent labeling in cells and observe cell behavior without labeling, although intracellular functional molecules and organelles are generally labeled with fluorescent dyes for HCA analysis. However, automatic image analysis of label-free cells is challenging because their image contrast is lower than that of labeled cells. The CellVoyager CV8000 satisfies these latest needs.

MAJOR FEATURES

■ Optimal cell-culture environment enabling long-term observation of living cells

The incubator mechanism of the system has been redesigned to improve the sealing of the incubator. As a result, cells can be cultured in a more uniform environment.



■ Software for analyzing images of label-free cells and 3D-cultured cells

The CellVoyager CV8000 comes with CellPathfinder, which is new image analysis software that can recognize and analyze images of unlabeled cells with the help of pattern recognition and machine learning functions. This software also has a 3D image analysis function for observing 3D-cultured cells similar to those in living organisms.

■ Quick imaging of multicolor-labeled cells

The CV8000 can accommodate four cameras (three in the previous CellVoyager CV7000). The time required for imaging cells stained with four colors is reduced by more than 20% compared with the CV7000. The number of selectable laser wavelengths has been increased from four to five to offer wider options for experiments and various observations of cells labeled with multi-fluorescent dyes.

■ Two Yokogawa Nipkow disks with industry-leading performance

The CellVoyager series uses Yokogawa's original confocal scanning disk technology based on the Nipkow disk. The



CellVoyager CV8000

conventional Yokogawa Nipkow disk with 50 μm pinhole diameter is suited for observing cells with weak fluorescence intensity. The CV8000 can also accommodate a disk with 25 μm pinhole diameter for capturing high-definition images especially with low-magnification objective lenses. Users can obtain clear images by using the two disks depending on the fluorescence intensity and the sample conditions.

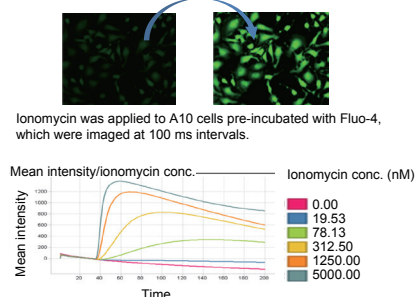
MAJOR SPECIFICATIONS

- **Optical system**
Confocal unit: Microlens-enhanced wide-view Nipkow disk confocal scanner
Excitation laser wavelength: 405 nm, 445 nm, 488 nm, 561 nm, 640 nm
Transmission-illumination source: LED
Objective lens: 2 \times to 60 \times (phase contrast, water immersion, long working distance)
Camera: High-sensitivity sCMOS camera (up to 4 units)
- **Environment control (stage incubator)**
Temperature control, CO₂ conc. control, forced humidification
- **Built-in dispenser (option)**
Designated disposable chips needed
- **Output data format**
Image: TIFF, PNG
Numerical data: CSV

APPLICATION EXAMPLE

• Measurement of calcium flux into cells

Ionomycin of various concentrations was added to cells using the dispenser of the CV8000. Kinetic changes in calcium concentration in the cells are shown in the graph below.



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