

Microcell

FDSS[®]/μCELL

Functional Drug Screening System

**96/384 whole plate dispensing and imaging.
Simple-to-use kinetic plate reader for
cell-based assays.**

Intracellular ion measurement

Membrane potential measurement

Luminescence measurement

The FDSS/μCELL is a kinetic plate reader with an integrated dispensing head and imaging-based detector.

Simultaneous dispensing into the entire 96/384-well plates and simultaneous detection of the kinetics of the fluorescence or luminescence intensity allow quick measurements with no time lag for the 96/384-well format.

The technologies employed in the FDSS series are integrated into a compact body, enabling simple-to-use operation, suitable for assay development or in research basic cell-based kinetic assays.



HAMAMATSU

PHOTON IS OUR BUSINESS

Features

① Whole Plate Dispensing and Imaging

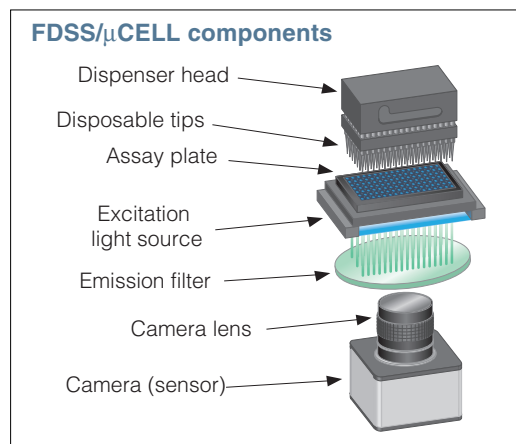
Resolving the problem of the point scan plate reader

Conventional plate readers use a point scan detector, resulting in time lags in the measurements for 96/384 wells.

This makes it difficult to achieve uniform conditions for data acquisition, especially for live cells.

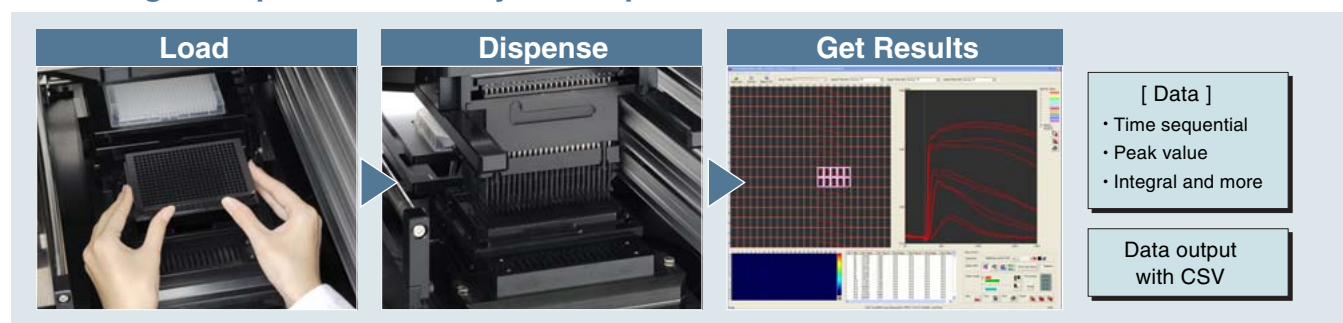


- Uniform conditions and no time lag for live cell measurements
- Reduced measurement time
- Simultaneous dispensing into the whole 96/384 plates
- Simultaneous detection of the kinetics of intensity changes



② Compact and Simple-to-Use

Providing a simple-to-use assay development environment



- Simple-to-use for all users
- Various data output and analysis functions

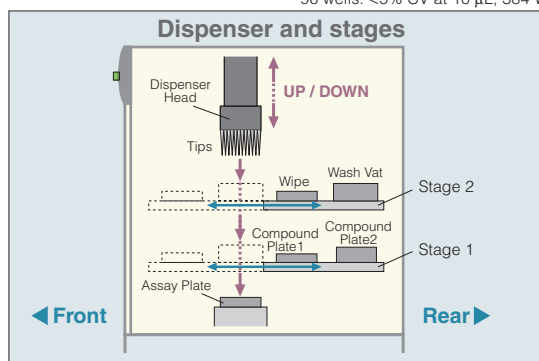
③ Versatile and Specially Designed System Structure

All screening technologies in a compact and reliable instrument!

Versatile and reliable liquid handling

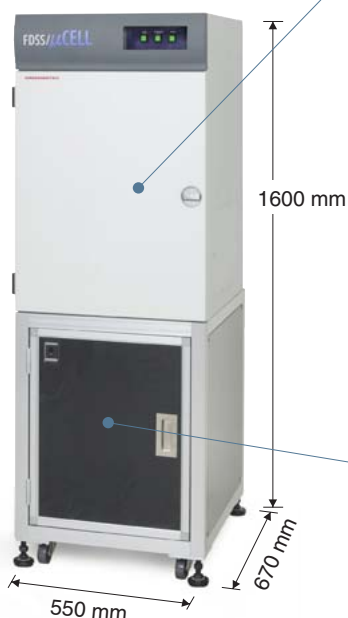
- High precision with whole plate simultaneous dispensing (CV below 5%)
- Disposable 96/384 dispensing tips
- Dispensing of multiple compounds possible
- Wash and wipe functions (factory built-in option)

*96 wells: <5% CV at 10 μL, 384 Well: <5% CV at 5 μL



Specially designed optics and measurement system

- Specially designed optics to detect the whole plate with high uniformity
- Specially designed illumination optics for fluorescence
- Long life-time light source with selectable excitation wavelength (480 nm or 530 nm)
- Motionless assay plate reducing the damages to live cells
- Proprietary imaging detectors allowing high-sensitivity measurement

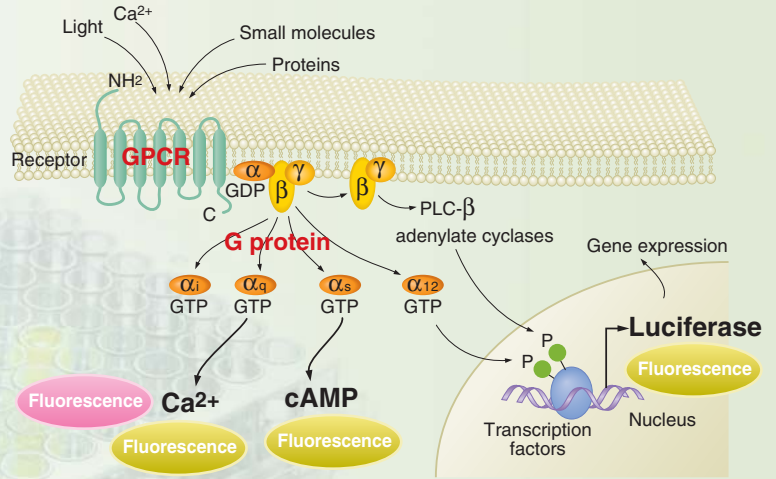


Applications

The FDSS/ μ CELL is a kinetic plate reader to measure various targets, including receptors like GPCR or ion channels, utilizing fluorescence/luminescence reagents for intracellular ions or membrane potential.

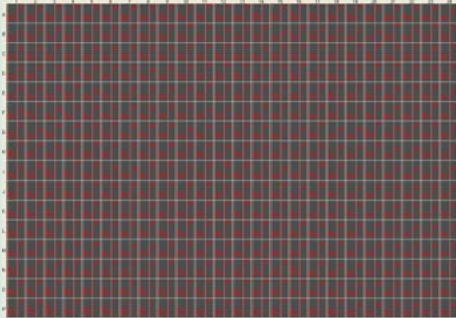
The FDSS/ μ CELL can also measure end-point assays, including cell proliferation or cytotoxicity assays.

- Intracellular ion measurement
- Membrane potential measurement
- Luminescence measurement



Calcium Assay with Fluo-4 (1)

- Cell: HEK293
- Ligand: 1:100 nM Carbachol, 2: 0.1% Triton x100

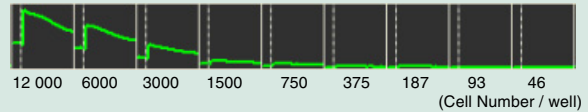


Carbachol peak CV%=7.50
Excellent dispensing uniformity

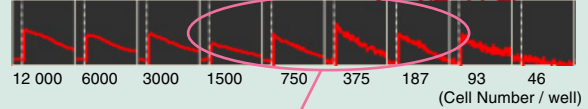
Calcium Assay with Fluo-4 (2)

- Cell: CHO-K1
(12 000, 6000, 3000, 1500, 750, 375, 187, 93, 46 cells/well, The cells are cultured for 12 hours.)
- Ligand: 200 nM ATP

Fluo-4 (RFU)

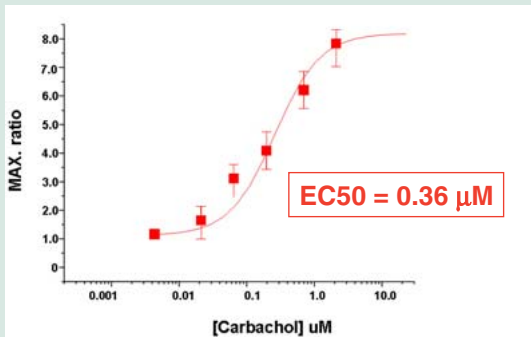


Calcium Ion (Ratio)

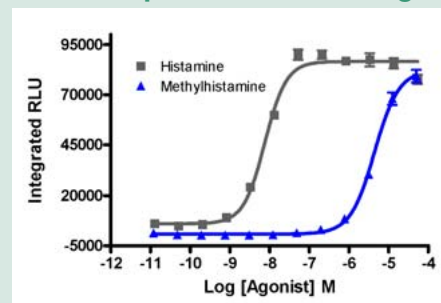


Detects signal even for fewer cells

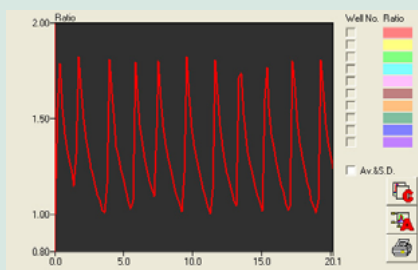
Normal HEK293 cells stimulated by Carbachol



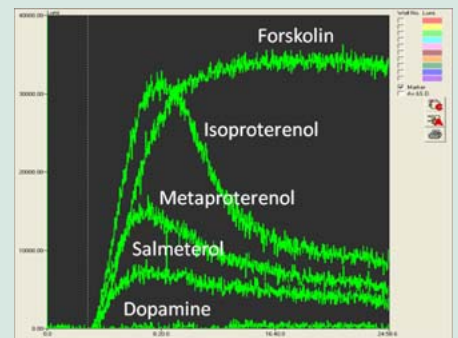
Calcium measurement of H1 NFAT HEK293 by BacMam Aequorin from Invitrogen



Cardiomyocyte calcium oscillation



Kinetic analysis of endogenous b2AR full and partial agonists in HEK293 cAMP GloSensor cell line from Promega



System Selection Guide

Usage	Fluorescence	Fluorescence and Luminescence	Luminescence
Dispenser head	96 or 384		
Sensor	Fluorescence sensor	Fluorescence/Luminescence sensor	
Light source / optics	Fluorescence sensor unit		Luminescence sensor unit
Wash unit	Factory built-in option		
Barcode reader	Option		

Application

Assay	Reagent
Calcium ion	Fluo-4, Fluo-3, Fluo-4NW, Ca kit and Fluo-8, etc.
Ion channel	FluxOR(K ⁺), Sodium Green(Na ⁺), Dibac4(3) and FMP, etc.
Luminescence	Aequorin and Luciferase, etc.

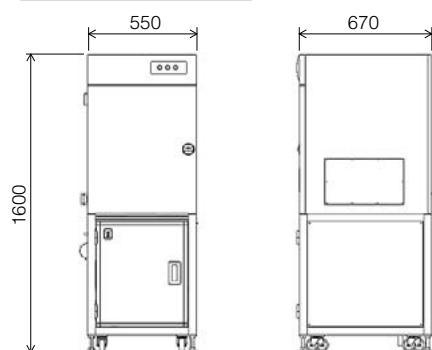
Specifications

Dispenser	96-tip type: 10 μ L to 200 μ L 384-tip type: 1 μ L to 30 μ L
Sensor	High-speed, high-sensitivity digital CCD camera for fluorescence
Sampling time (Interval)	0.5 s to 100 s / Data point
Light source optics for intracellular ion measurement	480 nm excitation and 540 nm emission
Plate handling	Assay plate \times 1 and compound plate \times 2
Adaptable microplate	Clear bottom black plate
Tip / Plate loading	Manual loading
Maximum sampling data point	4000
Dimension / weight	550 mm (W) \times 670 mm (D) \times 1600 mm (H) / Approx. 200 kg

Options

Dispenser	96-tip type or 384-tip type (exchangeable)
Washing unit	Washing bath \times 1 and wipe stage \times 1
Barcode reader	Assay plate and/or compound plate
Light source optics for membrane potential measurement	530 nm excitation and 590 nm emission

Dimensional Outlines (Unit: mm)



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