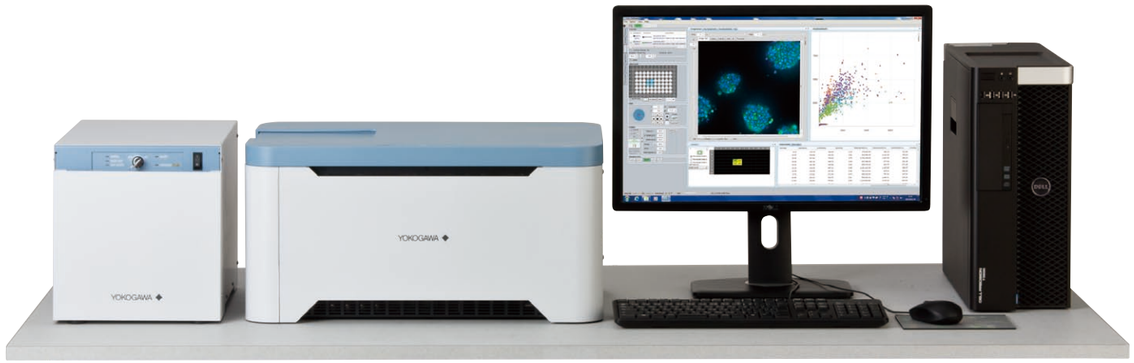
Example of setup



Specifications

Item	Specification
Optics	Microlens enhanced dual wide Nipkow disk confocal, Phase contrast (Optional add-on)
Laser/Filter	Laser : Choose 2-4 lasers from 405/488/561/640nm, 10-position Filter wheel (built-in)
Camera	sCMOS 2560×2160pixel, 16.6×14.0mm
Objective lens	Max.6 lenses (Dry: 2x, 4x, 10x, 20x, 40x Long working distance: 20x, 40x Phase contrast: 10x, 20x)
Sample vessel	Microplate (6, 24, 96, 384 well), Slide glass, Cover glass chamber*1, Dish (35, 60mm*1)
XY stage	High-precision XY stage, designated resolution 0.1µm
Z focus	Electric Z motor, designated resolution 0.1µm
Autofocus	Laser autofocus, Software autofocus
Feature data	Number of cells/cellular granules, Intensity, Volume, Surface area, Area, Perimeter, Diameter, Sphericity, Circularity, etc.
Data format	Image : 16bit TIFF file (OME-TIFF), PNG Numerical data : FCS, CSV, ICE
Workstation	Measurement and analysis workstation
Size/weight	Main unit : 600×400×298mm 38kg Utility box : 275×432×298mm 18kg
Environment	15-30℃, 20-70%RH, No condensation
Power consumption	Main unit and Utility box : 100-240VAC 800VAmax, Workstation : 100-240VAC 650VAmax

*1 Under development *2 Display is not included with CQ1 system

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CLASS 1 LASER PRODUCT
IEC60825-1 : 2007

Safety Precautions

* Read the user's manual carefully in order to use the instrument correctly and safely.
* This product falls under the category of class 1 laser products.

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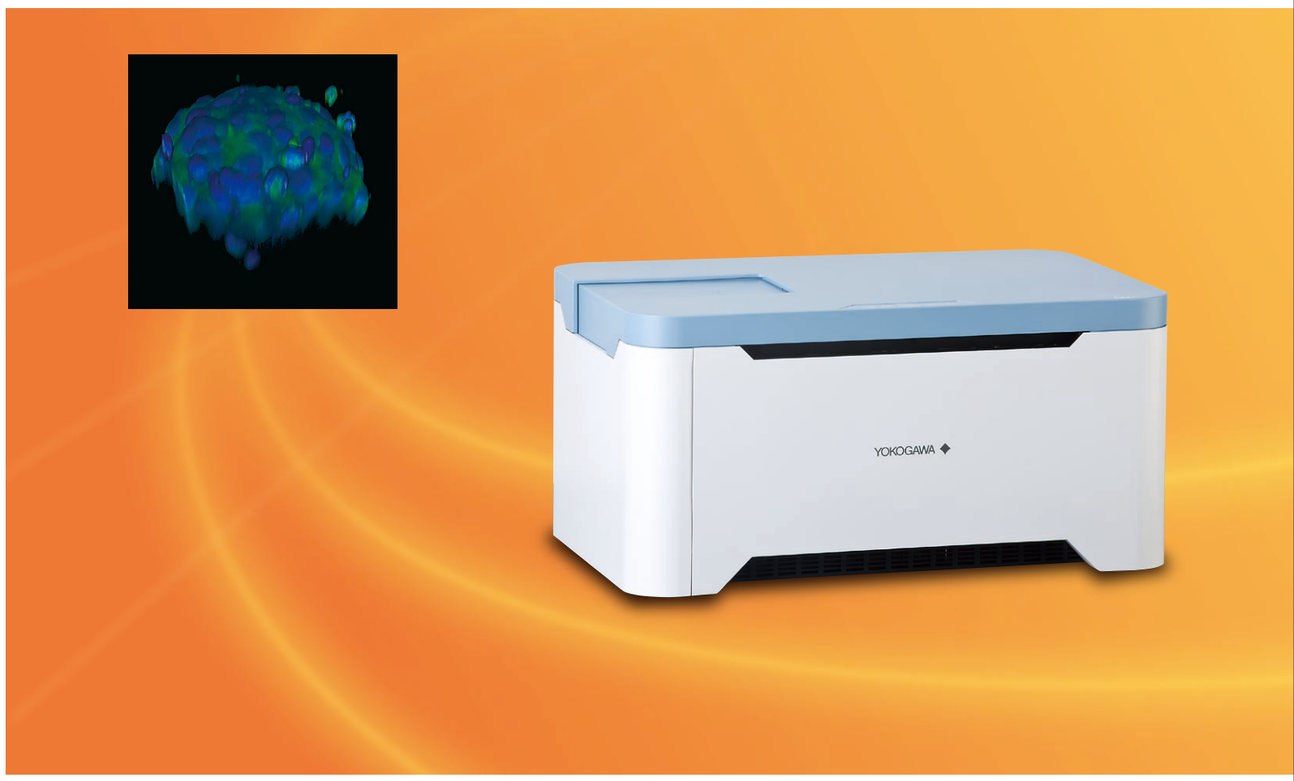
Confocal Quantitative
Image Cytometer

CQ1

YOKOGAWA

Confocal Quantitative Image Cytometer CQ1



Bulletin80J01A01-01E

Cell clusters directly measured by high-throughput 3D imaging

Confocal Quantitative Image Cytometer **CQ1** offers a new approach to image quantification

Enables measurement of spheroids, colonies and tissue sections

- No need to remove cells from culture dish, in contrast to traditional flow cytometry
- Nipkow spinning disk confocal technology allows high-speed yet gentle 3D image acquisition
- Rich feature extraction to facilitate sophisticated cellular image analysis
- Wide field of view and tiling capability enable easy imaging of large specimen

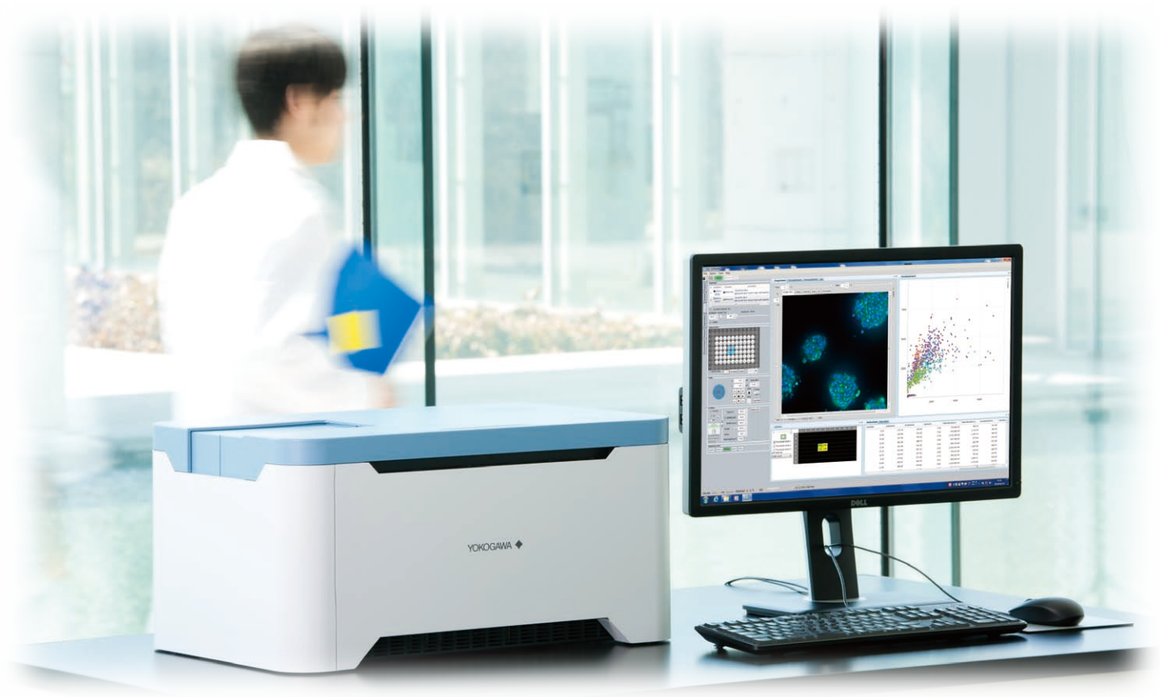
Offers the similar operability to traditional flow cytometer

- Feature data and statistical graphs displayed in real-time with image acquisition
- Easy to trace back to the original image from a graph spot, and make repetitive measurements

Open platform

- Expandable to integrated system as image acquisition and quantification instrument
- FCS/CSV/ICE data format readable by third-party data analysis software
- Connectable with external systems via handling robot*1
- A variety of cell culture and sample dishes are applicable

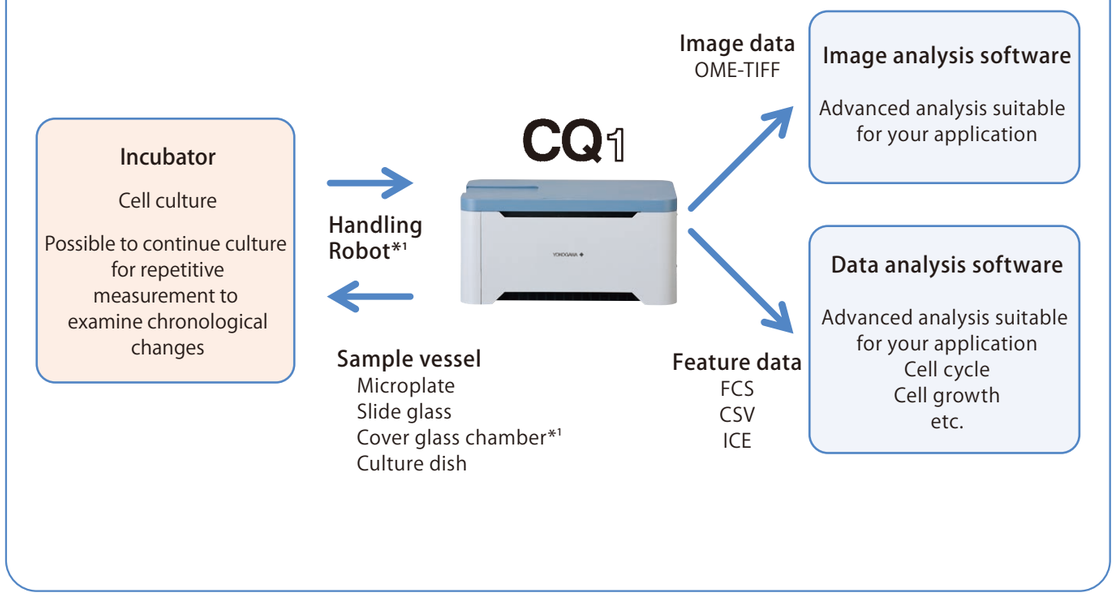
Compact footprint, light weight bench-top device; no need for darkroom



CQ1 enables 3D imaging and quantification of live cell clusters, such as spheroids within a 3D culture vessel, as they are, keeping the cells intact.
CQ1 exports feature data in general formats which are readable by various third-party software for advanced data analysis.
It is possible to construct fully customized CQ1-based system by integrating with external systems*1, via robot for culture dish handling.

	CQ1	General fluorescent imaging	Flow cytometry
Cell removal/suspension treatment	Not necessary	Not necessary	Necessary
Cell image confirmation	Possible	Possible	Not possible
Display feature data and graphs in real-time with imaging	Possible	Depends on devices	Possible
3D data measurement	Possible	Not possible	Not possible

System integration with CQ1



*1 Under development

Multiple functions fully integrated in a compact box

Sample setting

< Main unit >

Compact design contains fully integrated multiple functions to offer easy-to-handle confocal imaging system, without a need for complicated system integration; you only need to set a sample and run the software. User-friendly interface and versatile functions support your measurement and analysis.

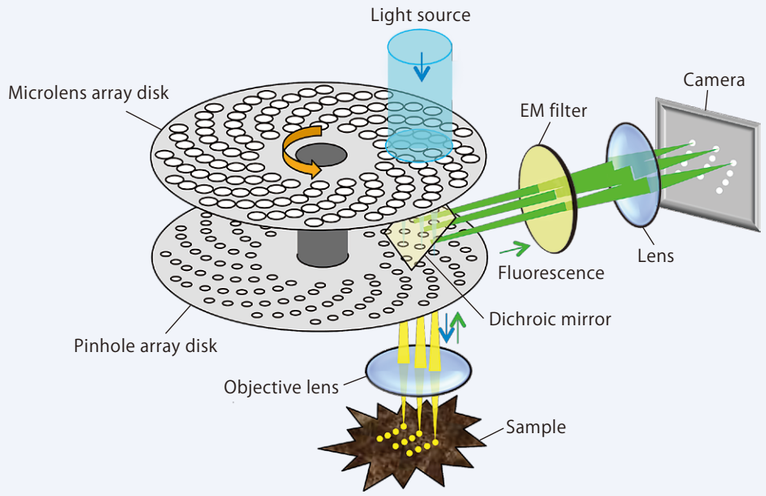
< Utility box >

< Phase contrast option >

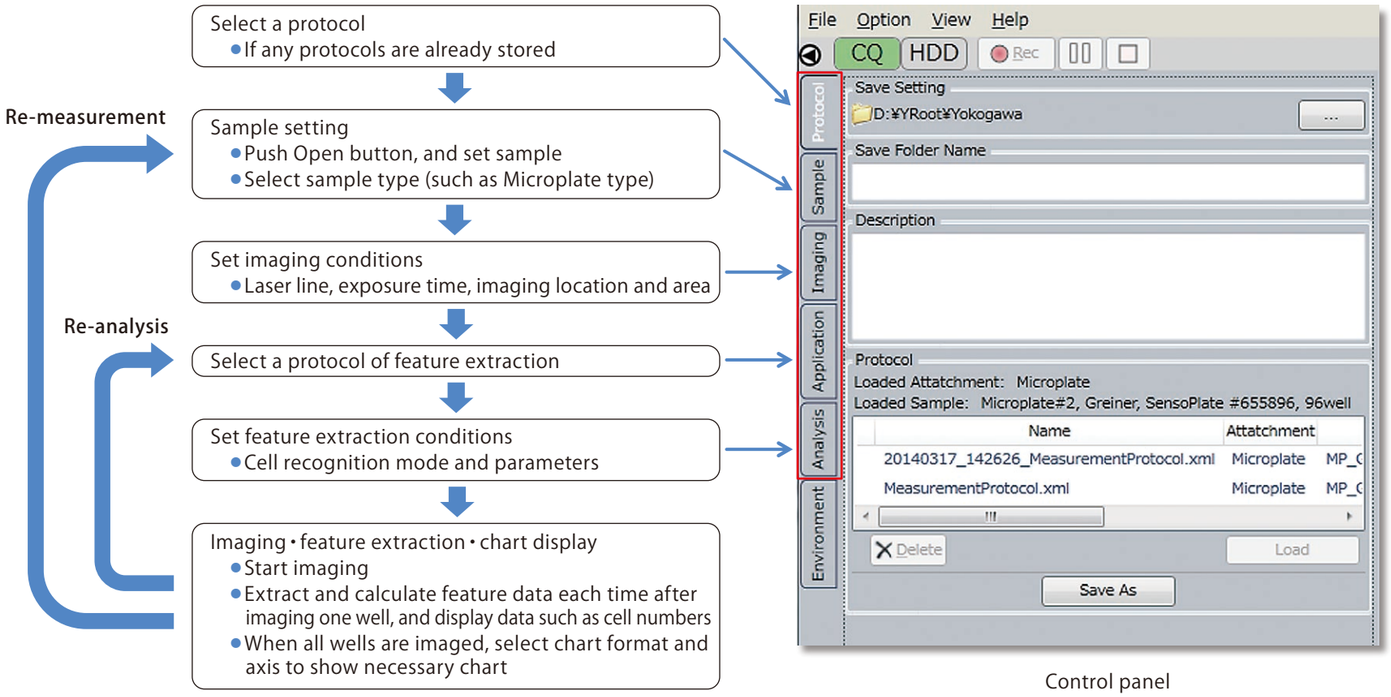
Retrofit phase contrast illumination/lens

Microlens enhanced dual Nipkow disk confocal

Two disks, including the “pinhole array disk” having many pinholes arranged in a helical pattern, and the “micro-lens array disk” that condenses excitation laser beam to individual pinholes, are jointly rotated at high speed to perform multiple scans over the observation area with approximately 1,000 laser beams.
Repeated scan with low power multi beams offers high-speed but gentle-to-cells confocal imaging. CQ1 employs wide Nipkow disks to achieve high-resolution and high-throughput.



Measurement procedure

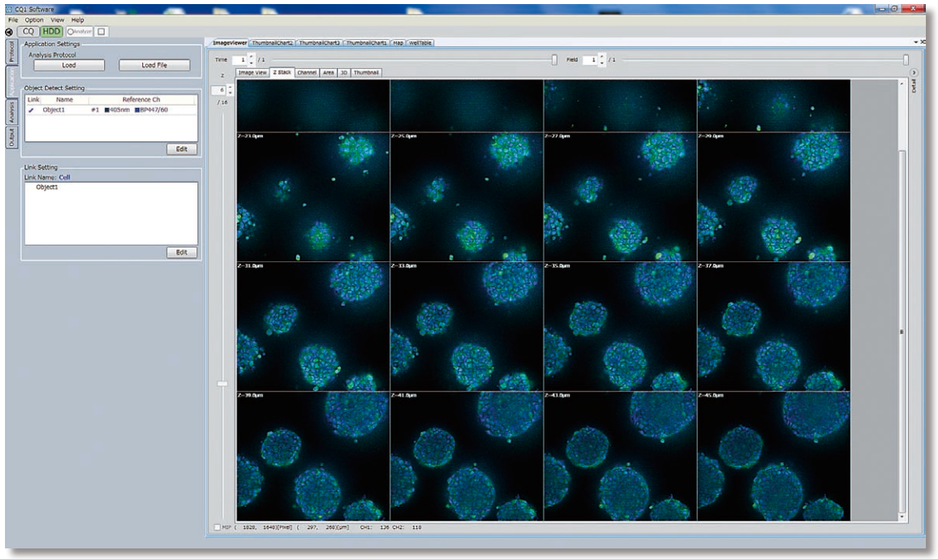


Control panel

Versatile applications

3D measurement of spheroids

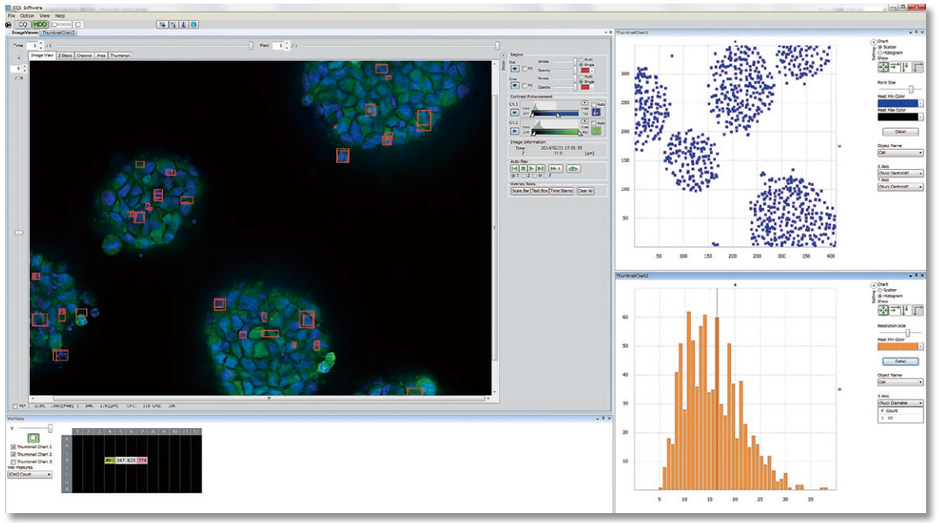
3D Imaging：High-speed 3D slice imaging (Z-axis direction) of spheroids.



Feature data：Recognize each individual cell within a spheroid in 3D, to measure cell number and size. Heat-map display is possible depending on the data.

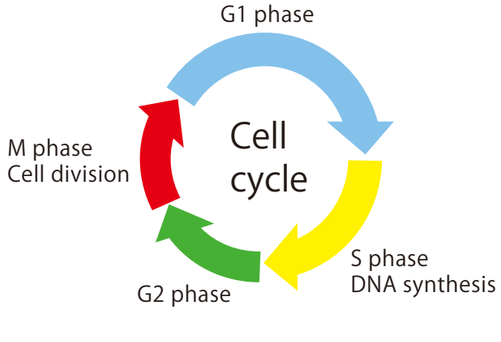
Chart display：Display graphs such as scatter diagram or histogram, based on cell size or fluorescent intensity of expressed proteins.

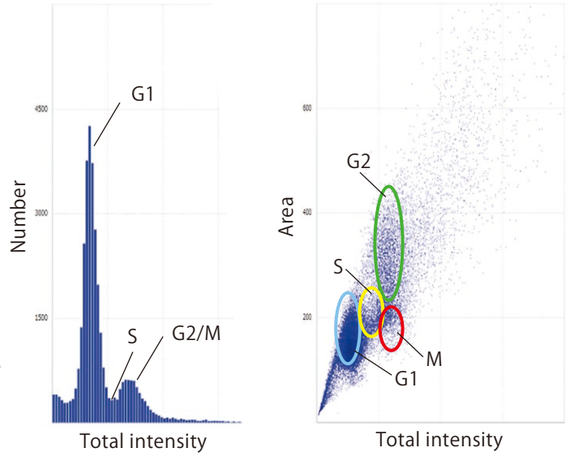
Correlation between graph and image：By clicking one spot on the graph, its corresponding image is shown.



Cell cycle analysis

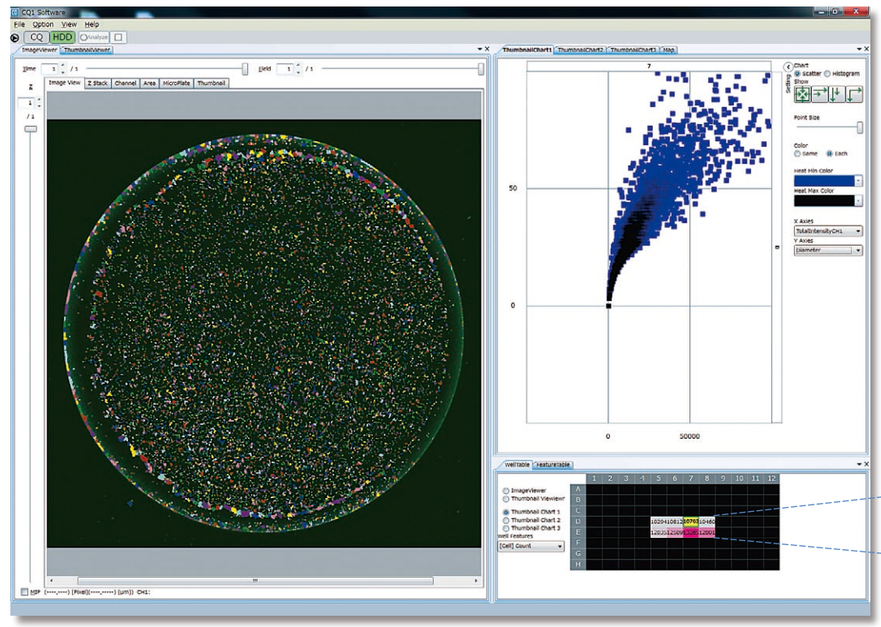
Cell cycle analysis is widely used for research on cell growth or working mechanism of anti-cancer drug.
By using DNA-binding fluorescent dyes, it is possible to judge the cell cycle from the data of nucleus area and total fluorescent intensity(indication of total amount of DNA). By clicking one spot on the histogram, its corresponding cell image is shown.





Cell growth judgment

The whole view of one well of a 96 well plate can be captured as a single image by using a 2x objective lens. It is possible to rapidly judge cell growth in each well based on cell numbers or individual cell area, most useful when you change drug conditions or transgenes in each well.



Graph display：
Shows distribution of such as cell area or intensity.

Target well：
Total cell number of each well is sequentially shown here after imaging each well