

Automated Live Cell Imaging System

Celloger Nano



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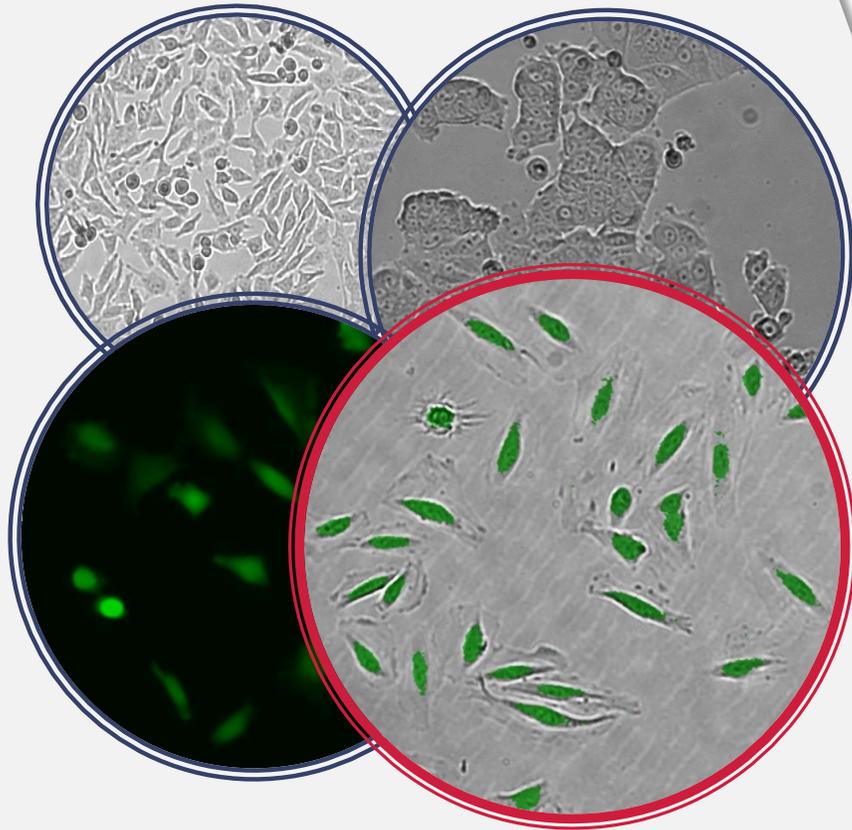
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I. Introduction

I. Live cell imaging



What is live cell imaging?

Live cell imaging is a method to examine living cells over a period of time using images acquired by time-lapse microscopy. Dynamic cellular processes and events are being observed in real time during the experimentation to study and understand the biological changes of cells. Live cell imaging has become a basic and mandatory method in many fields of life science, in research areas such as cell biology, stem cells, developmental biology, pharmaceuticals, drug discovery, and other fields.

Importance of live cell imaging

Starting with the discoveries of microscopes in the 16th centuries, there have been endless desires to peer into objects that cannot or hard to be seen by the naked eyes. With the development of technology and the introduction of live cell imaging, it has transformed the way researchers study cells, tissues, proteins, or other cellular interactions, and became a basic analytical tool in the study of life science. Compared to studying captured images of fixed cells, observing live cells in real time provides more reliable and relevant insights into cellular processes and changes.

I. Market analysis

Global Live Cell Imaging Market

Global market trend

Global live cell imaging market

(in US dollar, billion)



Key players

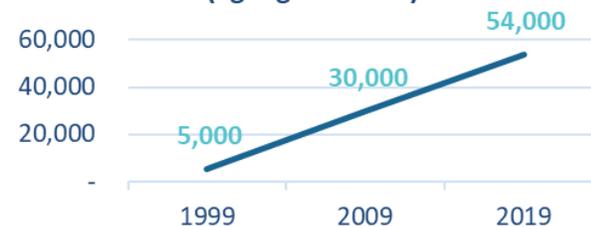
The leading players in live cell imaging market include BD Biosciences, Bio-Rad, BioTek, Carl Zeiss, CytoSmart, Logos biosystems, Merck KGaA, Nikon, Olympus, PerkinElmer, Sartorius, ThermoFisher.

Research trend

With the advancement of technology and increasing necessity of study on live cell imaging, research on this area is increasing exponentially

Research on live cell imaging

(*google scholar)



Key drivers

Key driving factors of live cell imaging market are rising concerns of cancer, the need for drug discovery, and development of advanced instruments.

Live Cell Imaging Market Interconnections



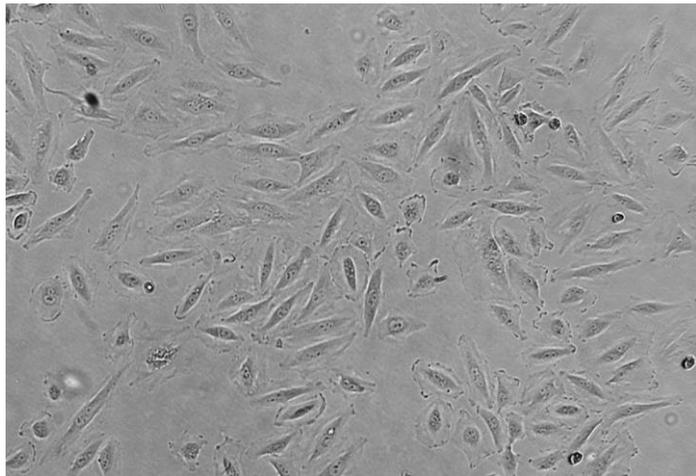
I. Light microscopy

Bright-field

- Standard optical microscopy used in the laboratory
- Can view stained and unstained cells
- Only light is used for illumination
- Used to see morphology of a cell (not details of a cell)

Application

Cell Morphology, Cell growth analysis, Confluency, Wound healing, Migration, Proliferation



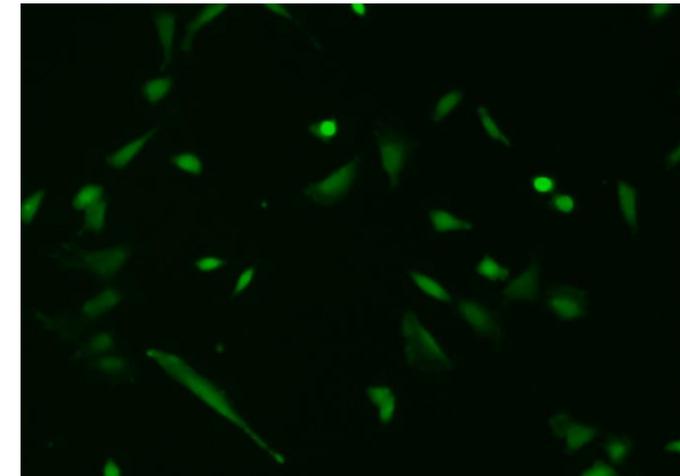
VS

Fluorescence

- Can monitor biological processes & dynamics of cell
- Uses fluorophores that emit light with specific wavelength when exposed to light.
- Sample itself provides light source used to form an image
- Possible to observe specific cells or structure in a cell

Application

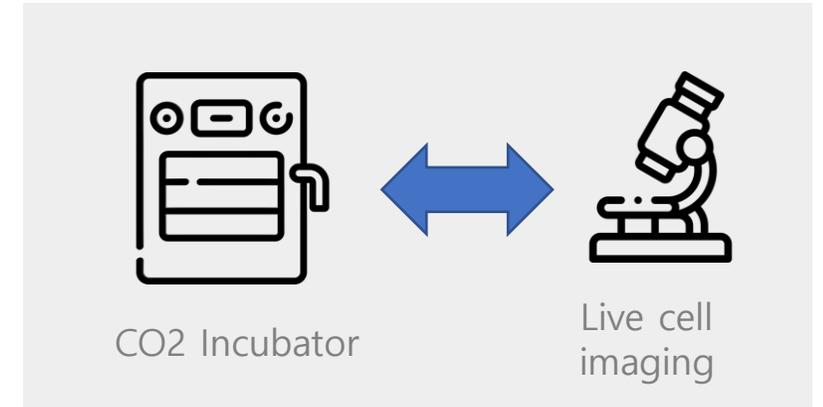
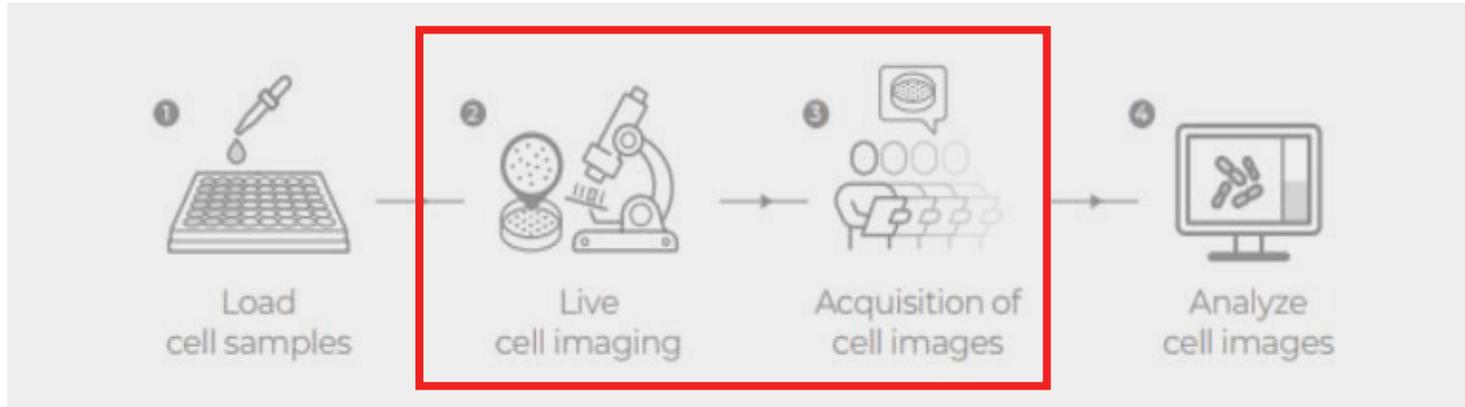
Cell viability & Cytotoxicity, cell cycle, Apoptosis, Necrosis, Co-culture, Transfection with reporter gene, Proliferation



I. Conventional method

Live cell imaging is such a tedious job!

Manual imaging method



Repeat these steps several times

Temperature & humidity suitable for cell growth

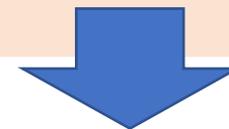
Disadvantages of conventional method

Labor intensive

Prone to human error

Hard to find same position

Unstable environment



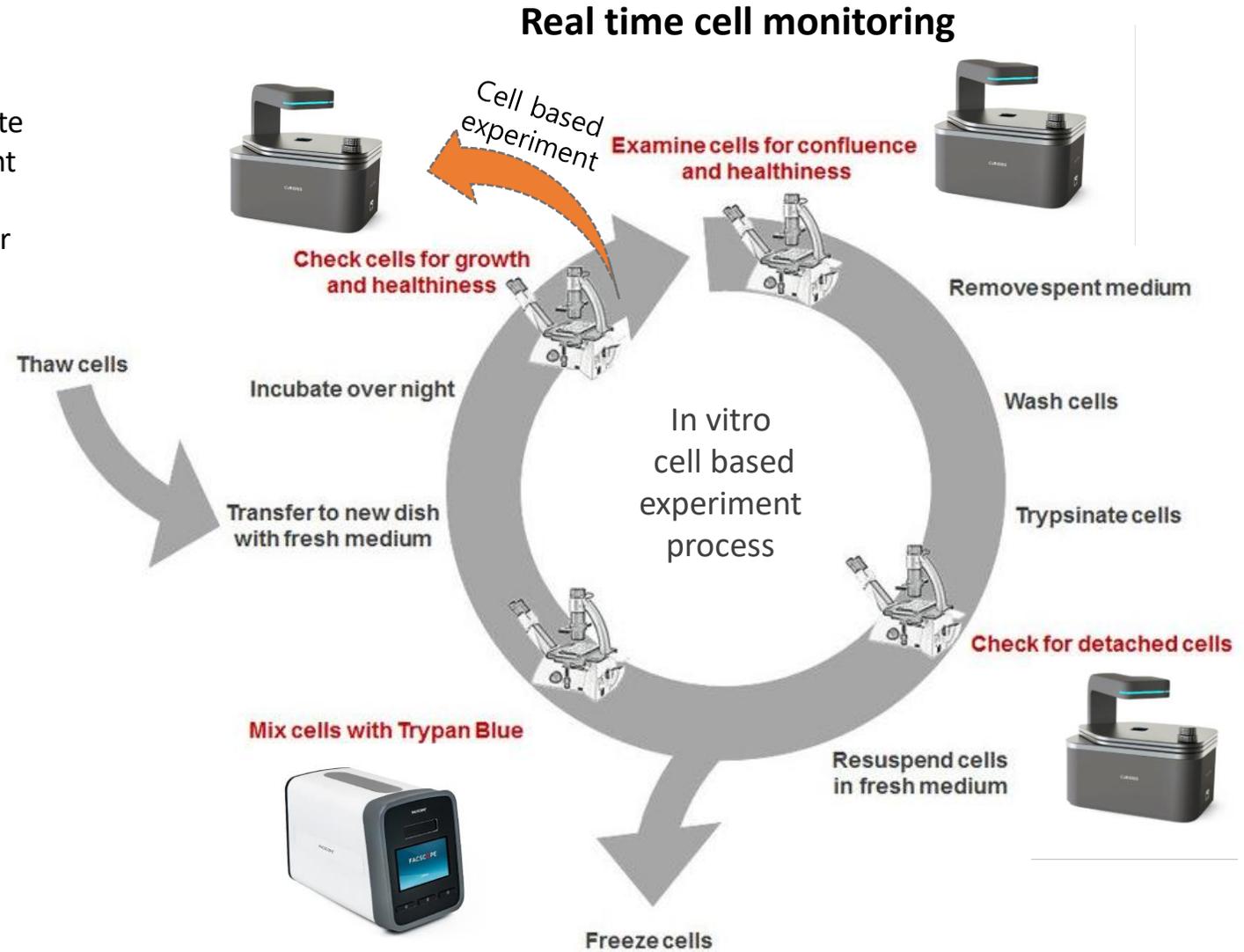
This is the reason why you need Celloger Nano!

II. Celloger Nano

II. Celloger Nano

Expand your cell-based research through our multifunction live cell imaging system, Celloger Nano.

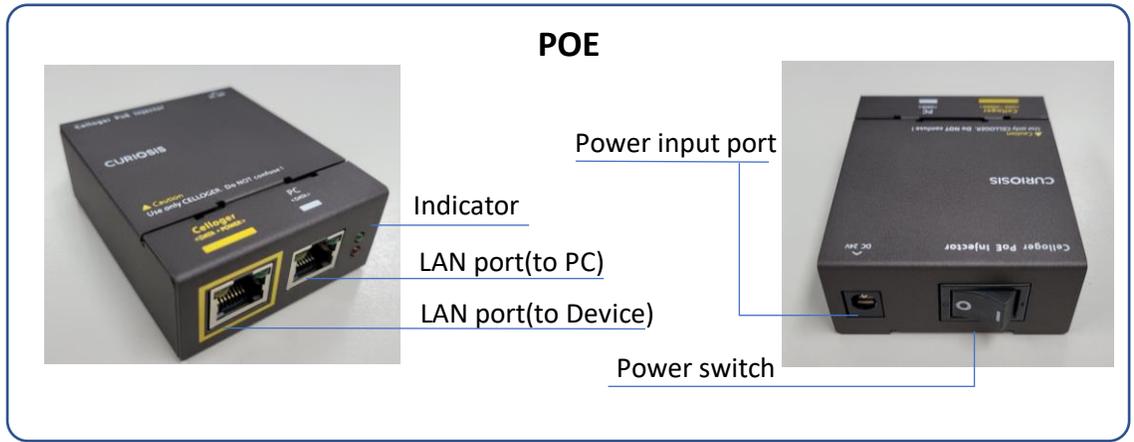
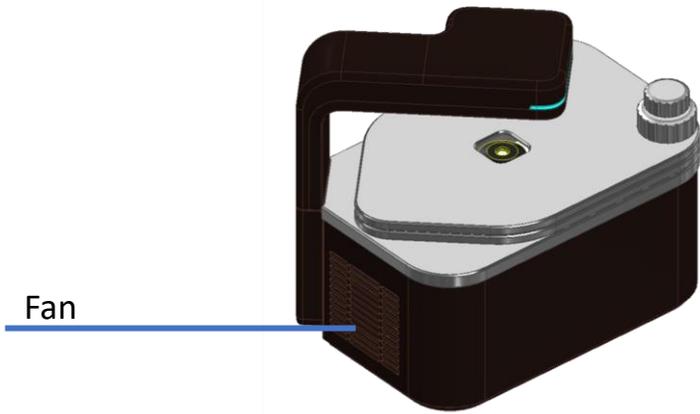
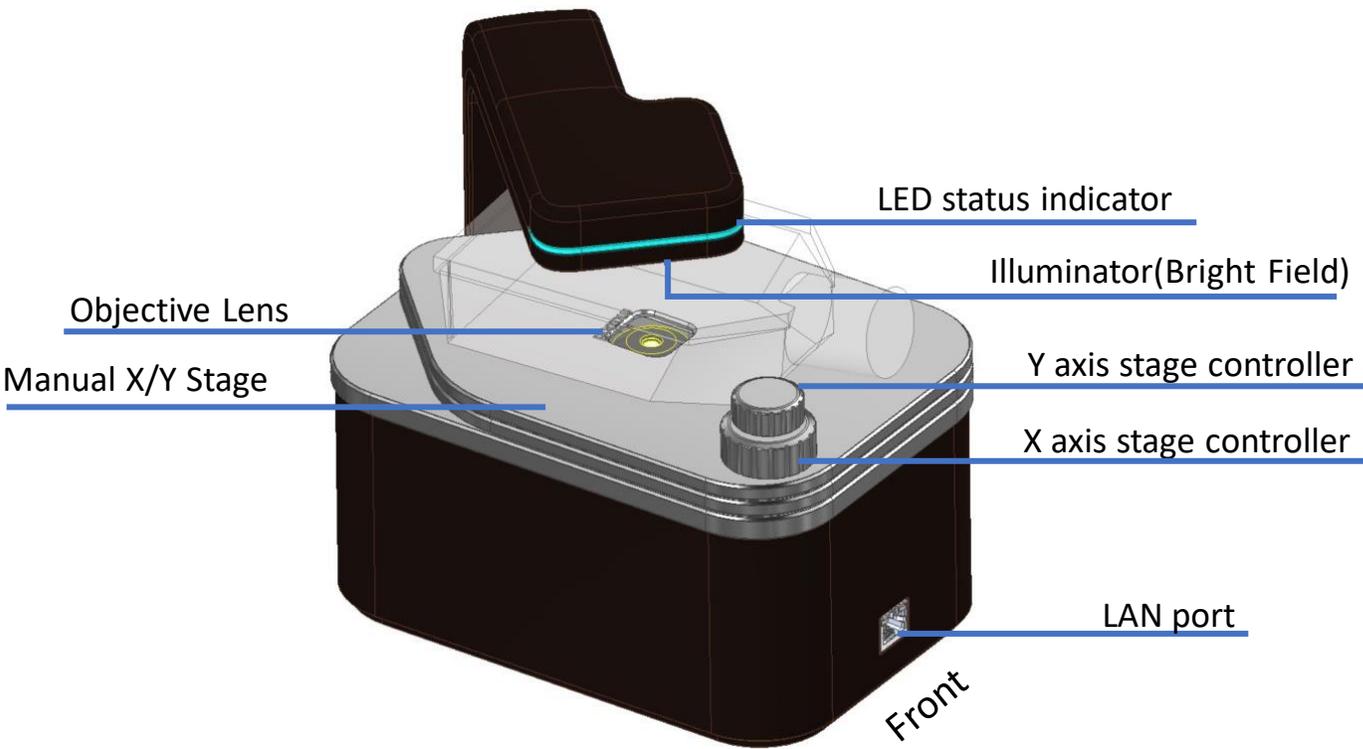
The NEW super compact and intuitive live cell imaging system, **Celloger Nano** - got everything you need to perform your sophisticated laboratory works. Equipped with exceptional fluorescence and bright field microscopy, time-lapse imaging, auto-focusing technology, precise stage controller, and user-friendly software, accelerates your cell-based research works.



II. Celloger Nano

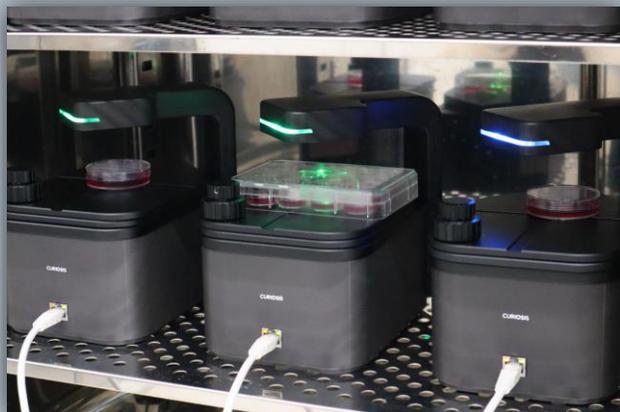
Front-right side view

Back-side view

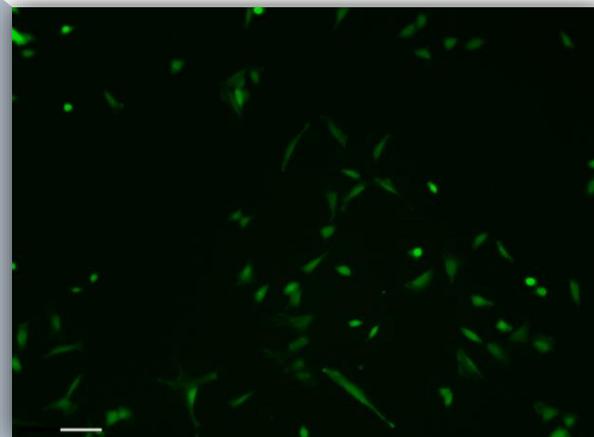


II. Features at a glance

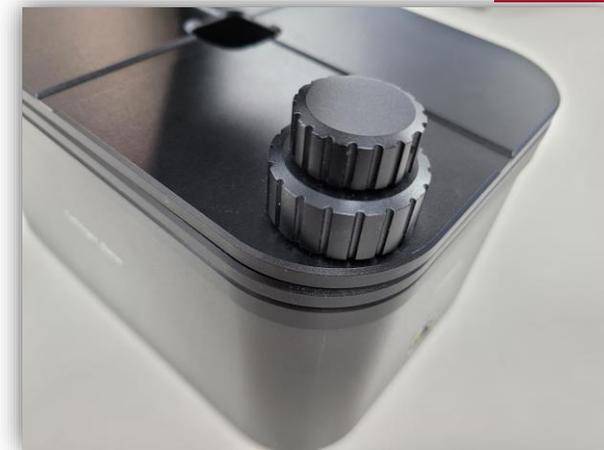
CURIOSIS



Compact system



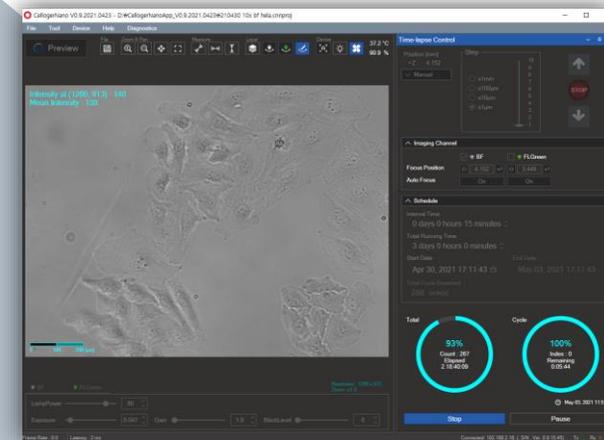
Stable imaging performance



Precise stage controller



Multiple vessel types

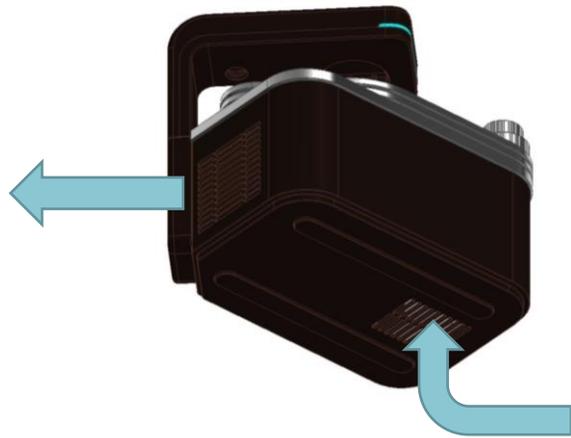


User friendly function

II. Key features

I. Compact system

- Celloger Nano is a very compact system with a size almost equivalent to half of A4 paper. Compared to other products, several Celloger Nano systems can fit into standard CO₂ incubator.
- Since the system weighs less than 3.2kg, it can be easily carried in and out of the incubator during the experiment.



- Maintaining the performance of a device working in a hot and humid environment is very challenging. With Celloger Nano, it is equipped with a fan that minimizes risk factors such as preventing moisture from forming and making it easier for maintenance.

Celloger Nano



211 x 146 x 188 mm

Other



305 x 195 x 220 mm

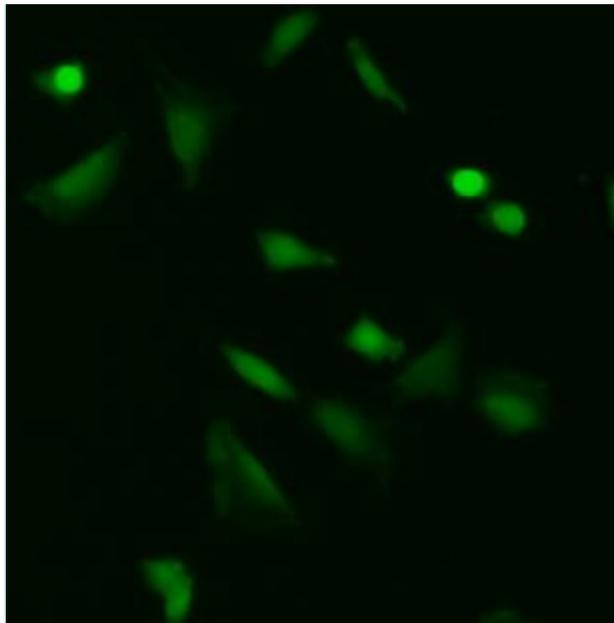
VS

II. Key features

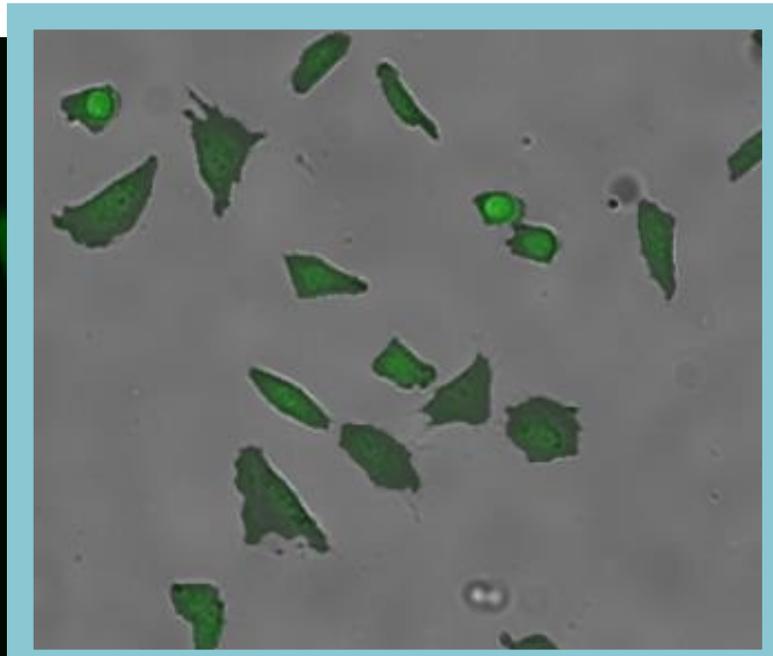
II. Stable imaging performance

- Celloger Nano is equipped with one color fluorescence either green or red, and bright field microscopy. Using the user-friendly software provided with the system, various applications can be done for the cell-based research.
- The wavelength is selected based on the most commonly used fluorescent dyes such as eGFP, CMFDA, Calcein AM (for green) & mRFP, mcherry, (for red).

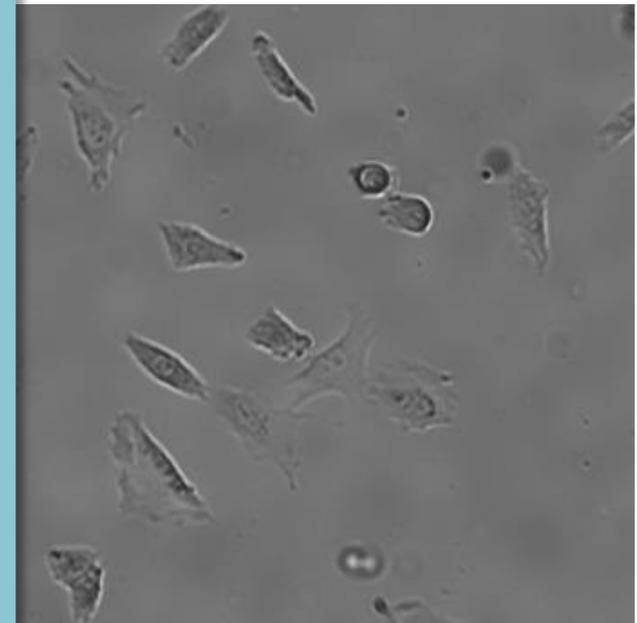
Fluorescence



Merged



Bright-field



Application
Cell viability & cycle,
Apoptosis,
Necrosis,
Cytotoxicity,
Co-culture,
Transfection,
Antibodies,
Proliferation

Application
Cell
Morphology,
Cell growth
analysis,
Confluency,
Wound
healing,
Migration,
Proliferation

II. Key features

III. Precise stage controller

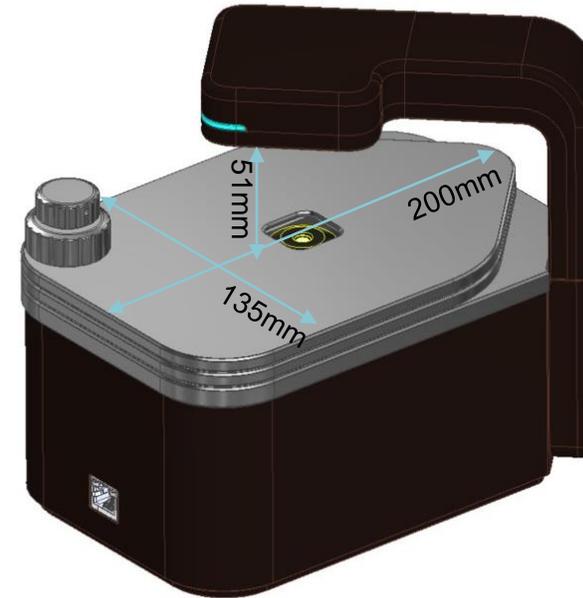
- Once the sample is placed at the center of the stage, there is no need to move the sample with bare hands. The sample positioning is done with a simple touch by using the precise stage controller. This controller facilitates X and Y axis positioning with distance of $\pm 6\text{mm}$ each axis.



II. Key features

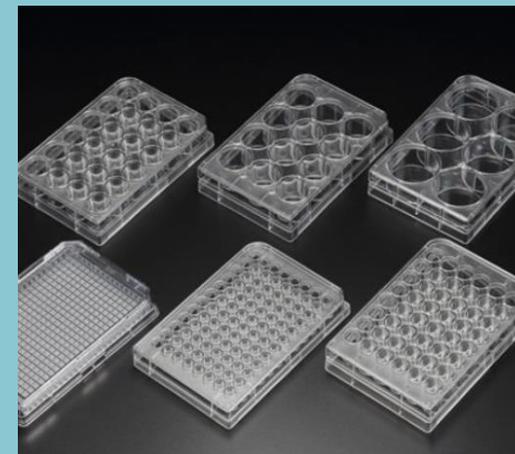
IV. Multiple vessel types

- Different kinds of vessels can be used in Celloger Nano using its wide stage that gives enough space for large labware placement.



Compatible with Celloger Nano:

- 35~150mm dish
- 6~384 well plate
- 25~175cm² Flask
- Round bottom 96well plate
- Deep well plate
- Cell culture slide



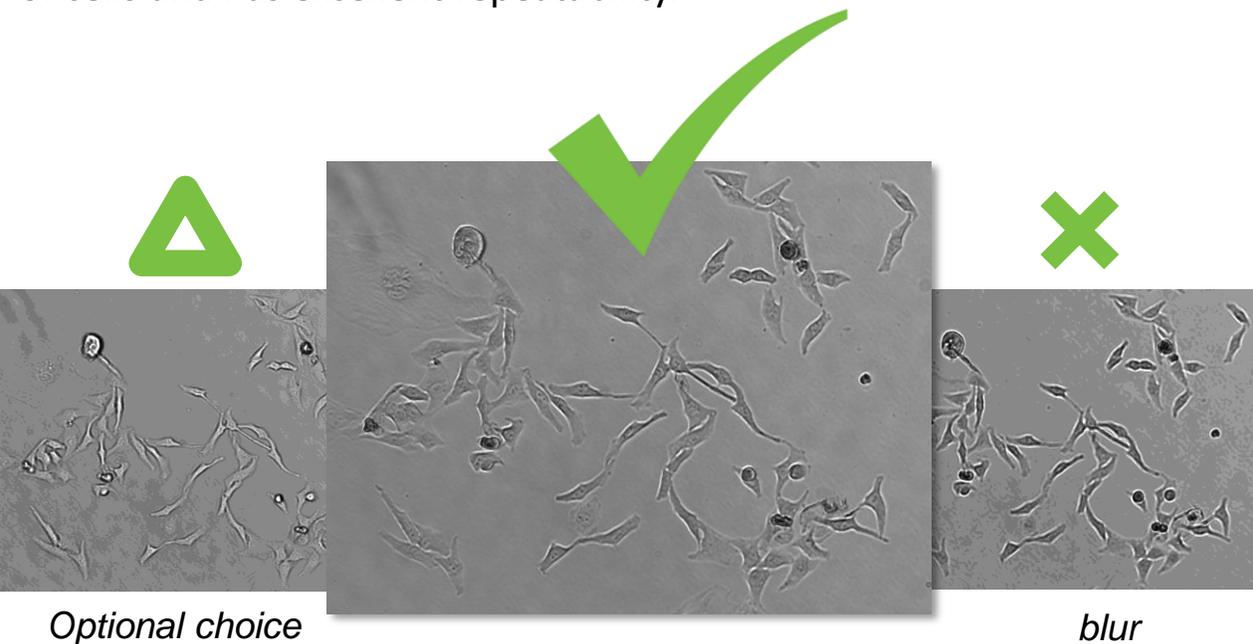
II. Key features

1. Autofocusing

V. User-friendly function

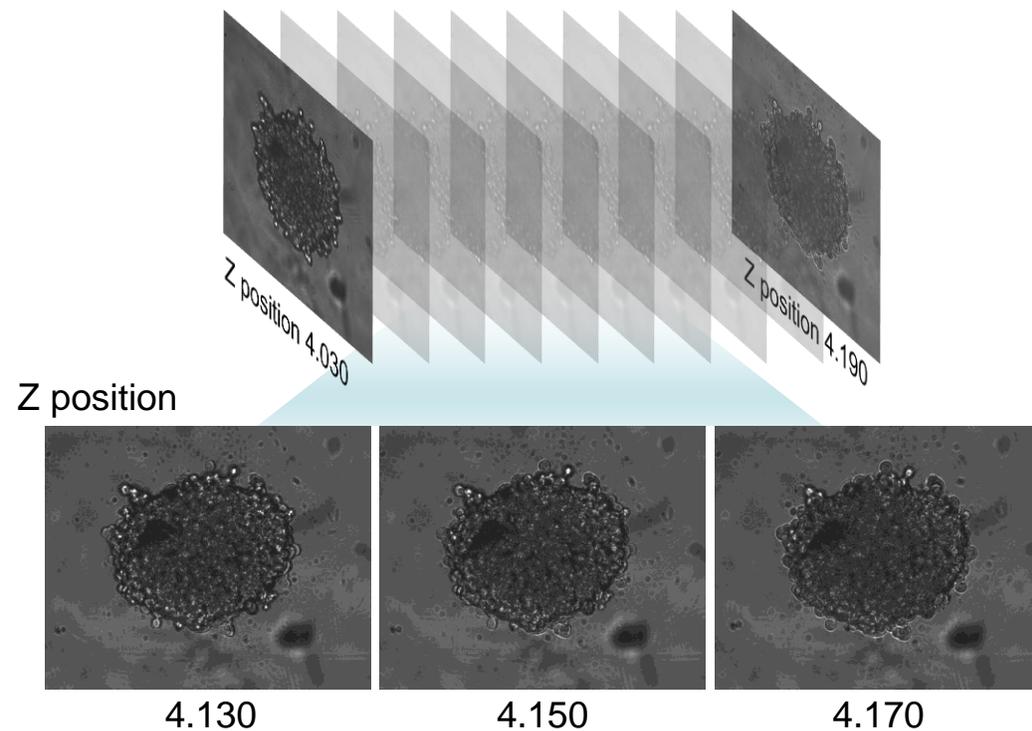
2. Z-stacking

Curiosity's unique autofocusing technology finds clear focal plane of cells and has excellent repeatability.



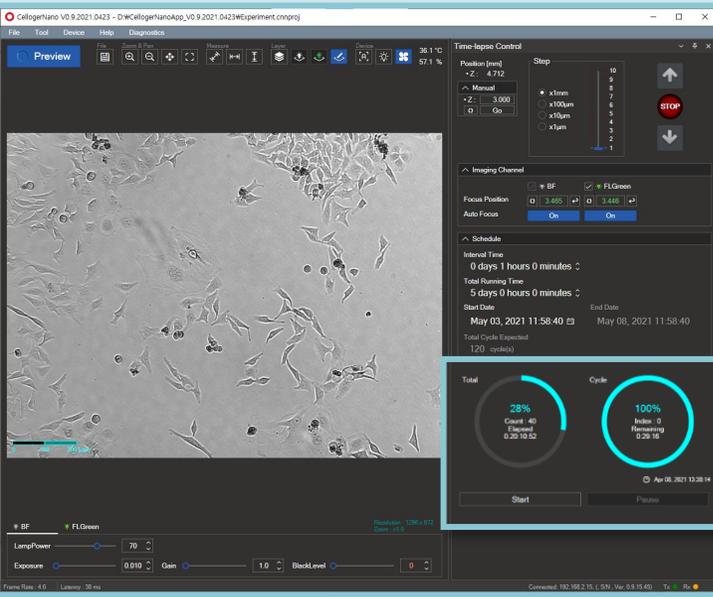
User can adjust autofocusing range/resolution

With Z-stacking function, spheroid cells can be observed using time-lapse imaging.

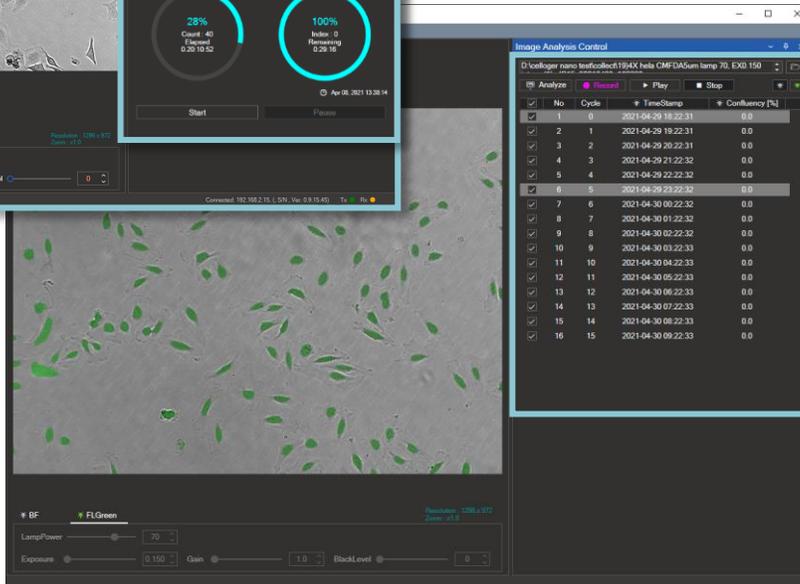


II. Key features

3. Time-lapse imaging



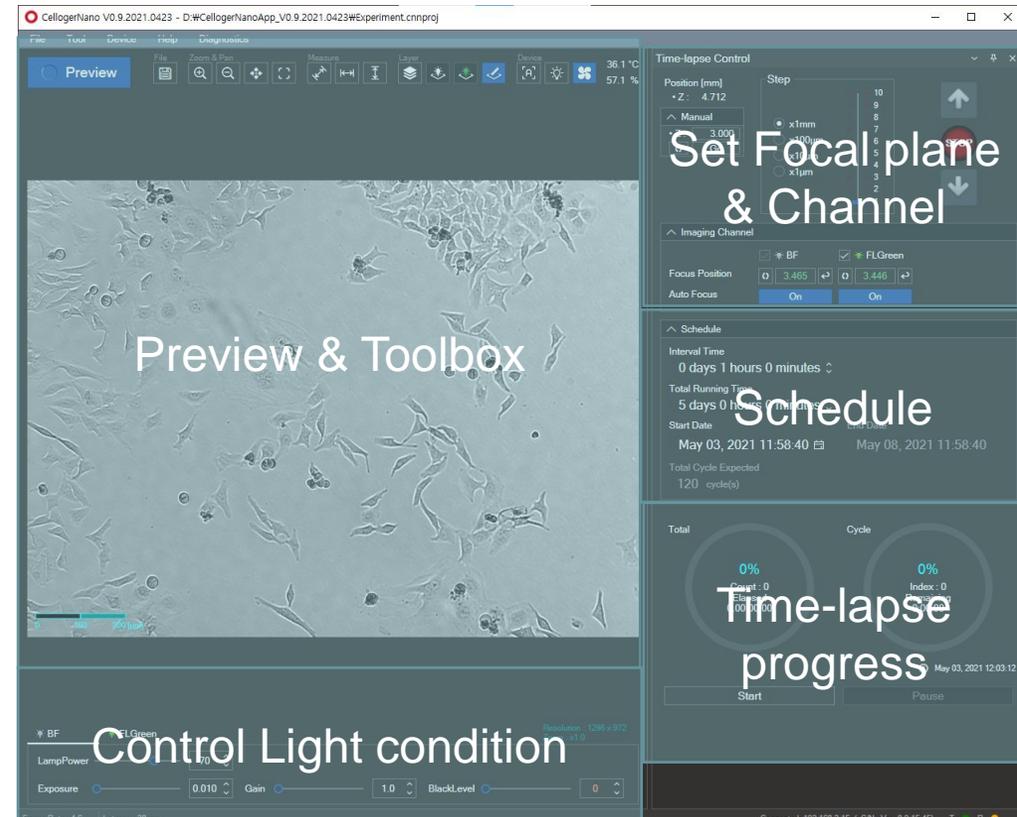
Intuitive time-lapse scheduling using CellogerNanoApp



V. User-friendly function

4. Intuitive software

Most functions can be found and operated on one screen



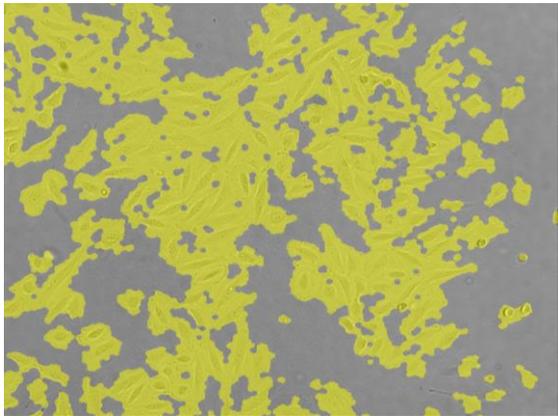
Time-lapse video including BR & FL merged images can be made using the analysis app.

II. Key features

5. Analysis tools

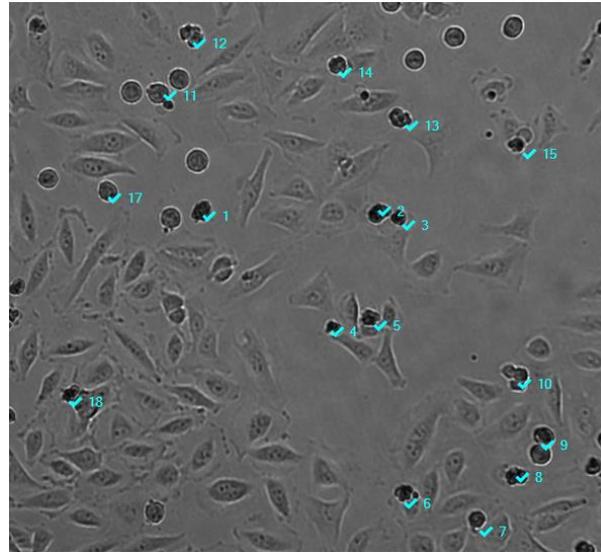
V. User-friendly function

Confluency

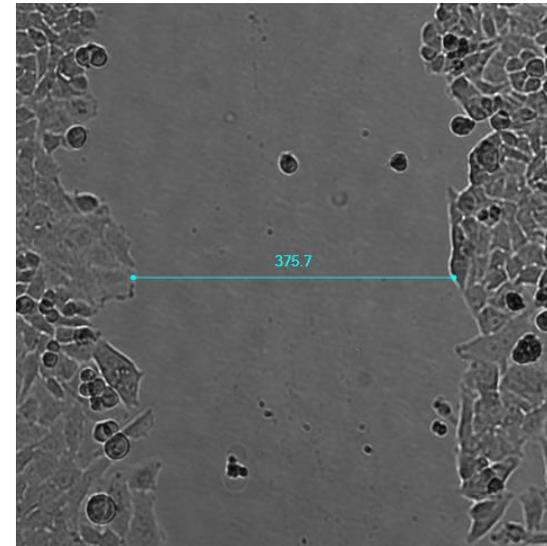


☀ Confluency [%]
49.7

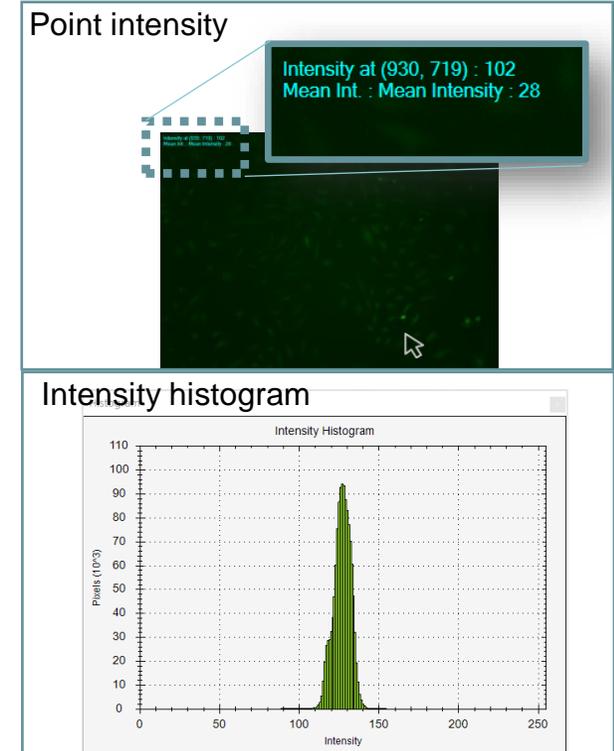
Counting (Manual)



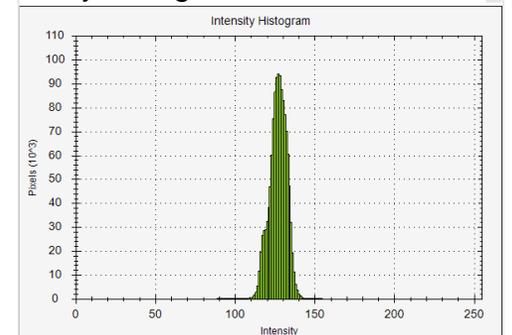
Ruler



Intensity

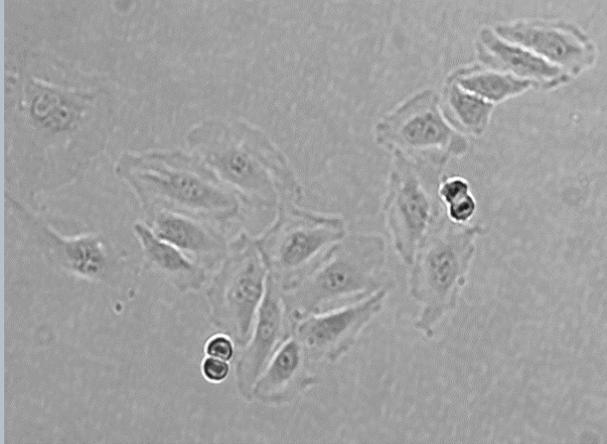


Intensity histogram

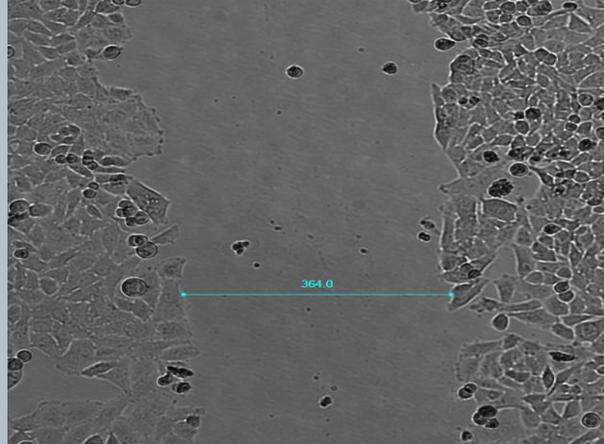


III. Application

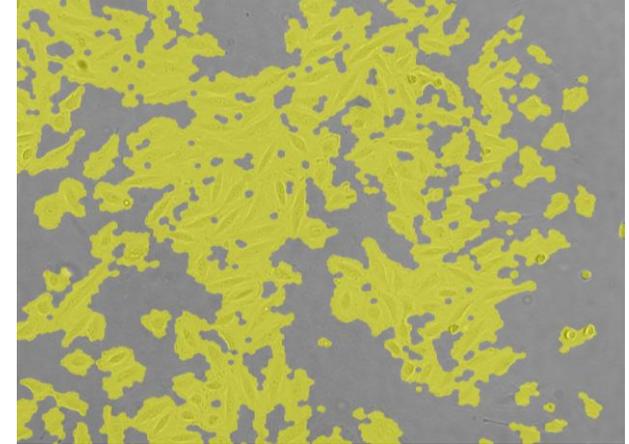
III. Applications at a glance



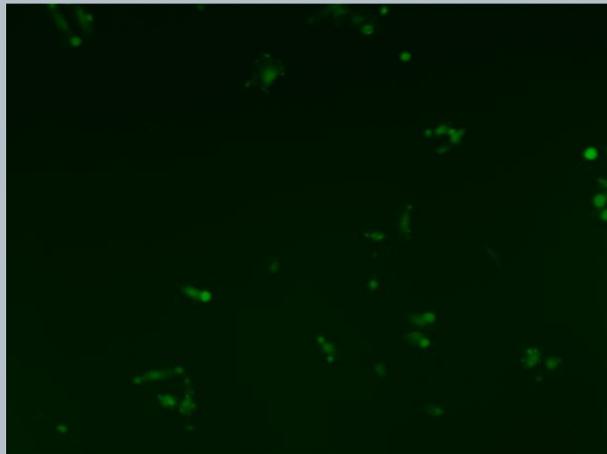
Cell monitoring



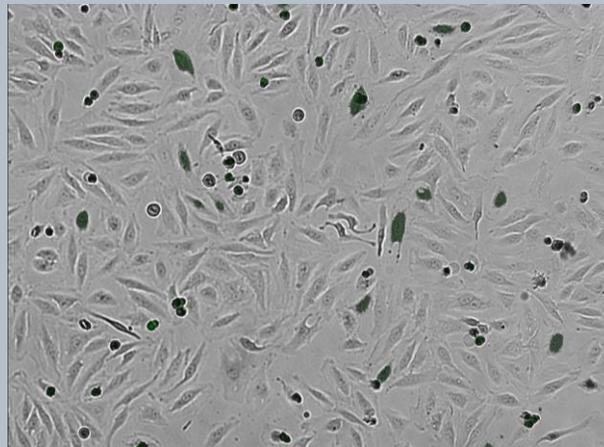
Wound healing assay



Cell proliferation



Cytotoxicity assay



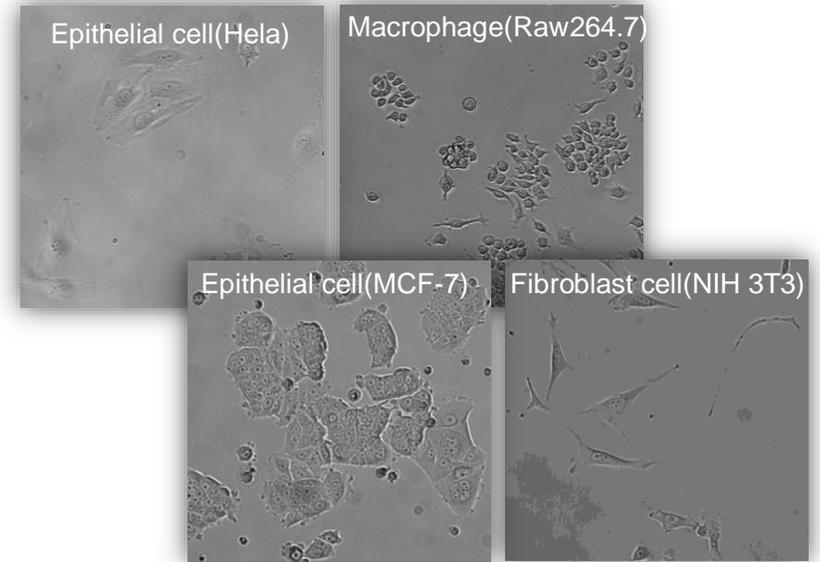
Transfection efficiency
assessment

Coculture monitoring

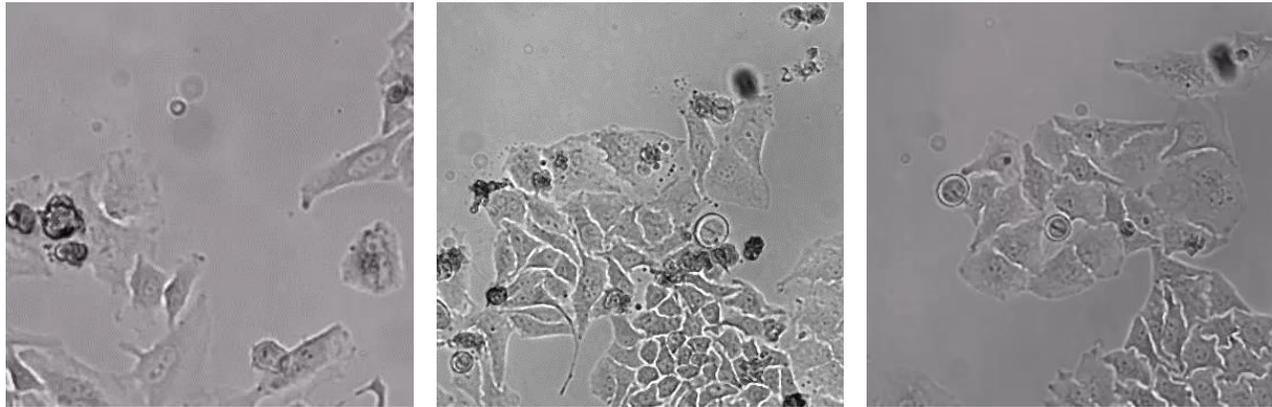
III. Application

1. Cell monitoring

- Studying morphological changes of the cells is an essential method in the cell-based experiments. The changes in cell morphology occur at every major point in cell cycle and monitoring these changes in appearance of cells in real time is very important.
- By monitoring cell morphology in real time using Celloger Nano, researchers can detect the signs of contamination in earlier stage, can determine senescence stage of the cells, and define the best time for subculture or harvest.



Cell morphology varies according to cell types

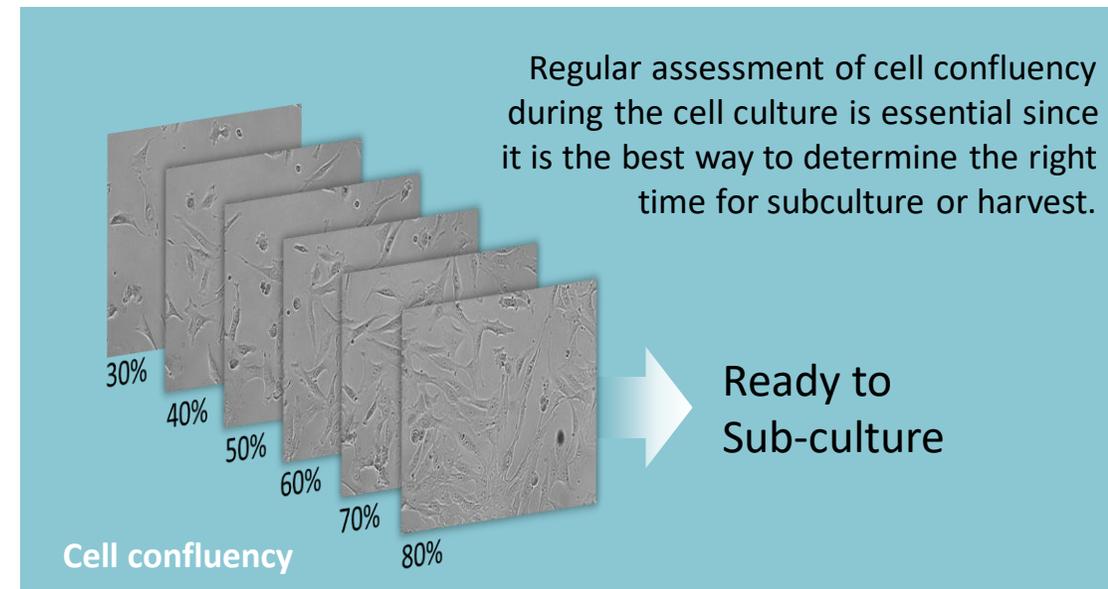


Migration

Cell death

Mitosis

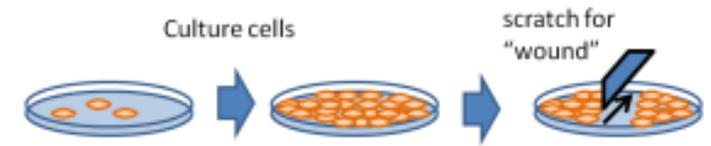
Monitor cell morphology changes over time (Video)



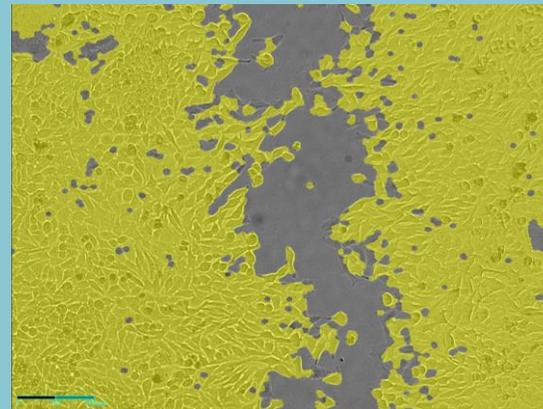
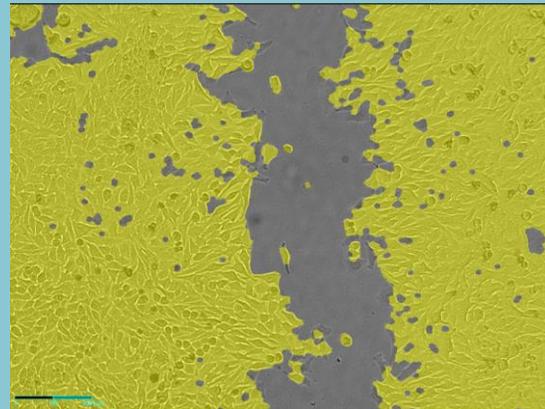
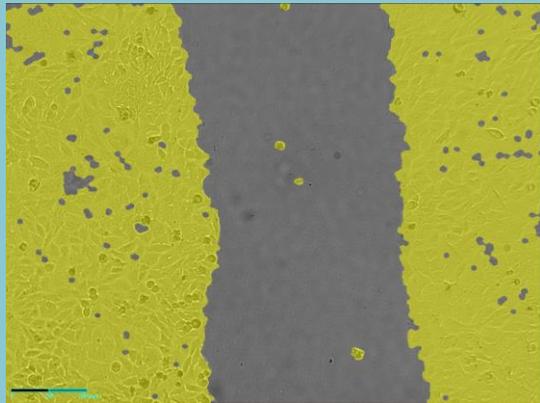
III. Application

2. Wound healing assay (Cell migration)

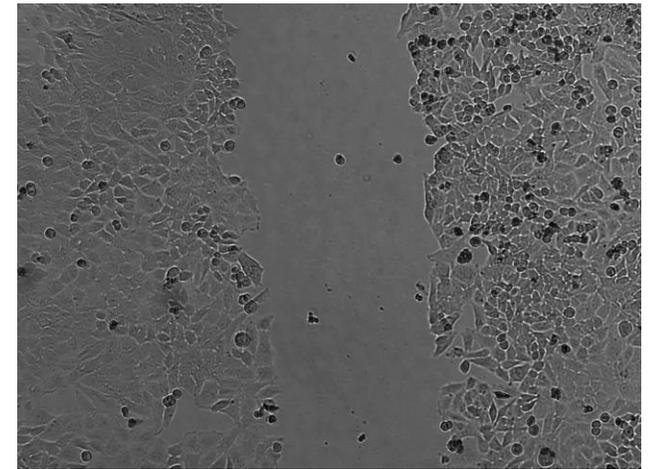
- Wound healing assay is the easiest and fastest way to check cell migration. When a scratch or space is created in the monolayer of cells, they show the process of movement to fill in the wound until the wound is entirely healed with the new healthy cells. and by monitoring this process over time. Using time-lapse imaging of Celloger Nano, researchers can analyze the wound healing events easily and effectively.



Process of wound healing assay



Wound healing image of HeLa cell

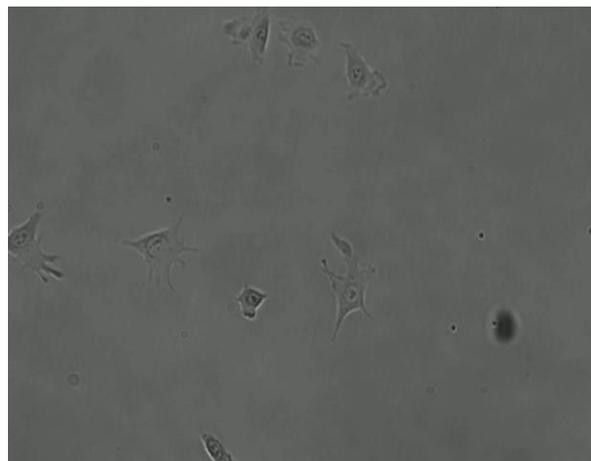
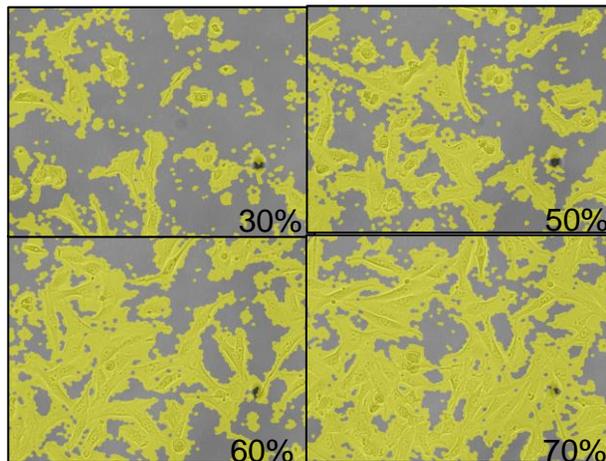


Wound healing video of HeLa cell

III. Application

3. Cell proliferation

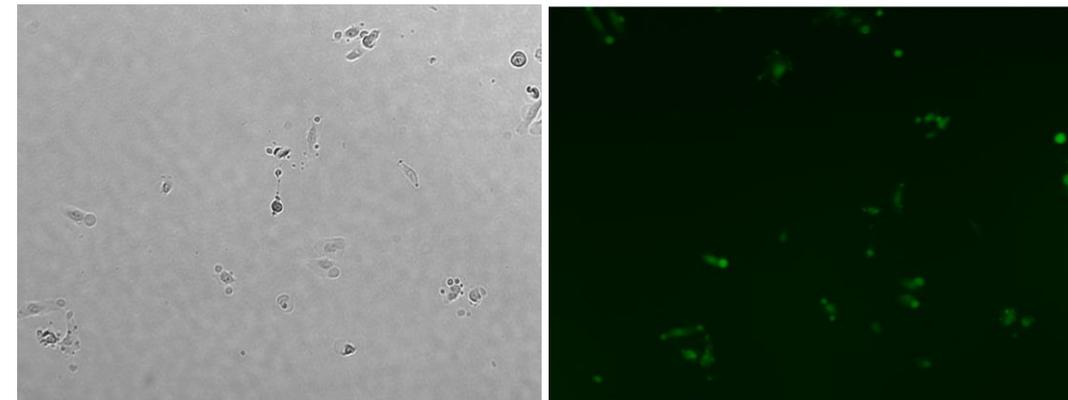
- Cell proliferation is to quantify the increasing number of cells over a period of time to verify that the cells are growing in normal growth process.
- As a method of quantification, number of fluorescent dyed cells or cell confluency is measured. In other words, a graph of cell number or confluency changes over time is mainly used as the result of proliferation.



Cell proliferation (NIH 3T3 cell)

4. Cytotoxicity assay

- Cytotoxicity refers to the state of being toxic to cells. Suppression of cell growth and division, cell lysis and apoptosis occur when stimulating activities such as toxic substances or environmental changes affect the cell health. Cytotoxicity assay is a way that compares these occurrences with the control group.
- Depending on the purpose of the experiment, the result of Cytotoxicity could be cell death rate by time, by drug concentration, and by drug type.

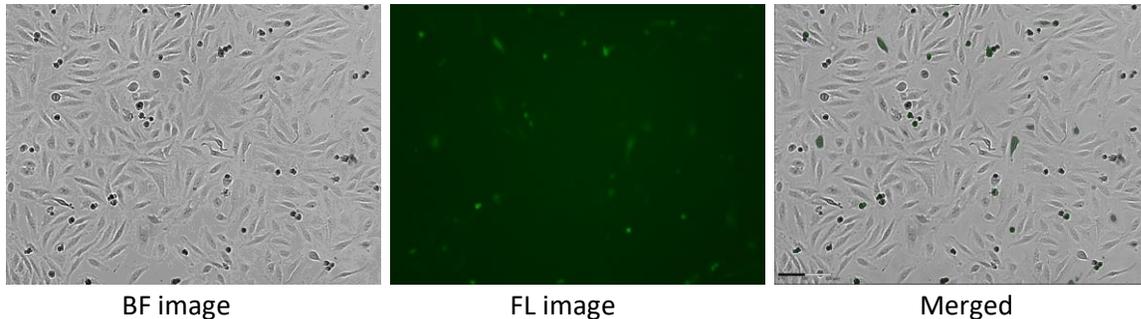
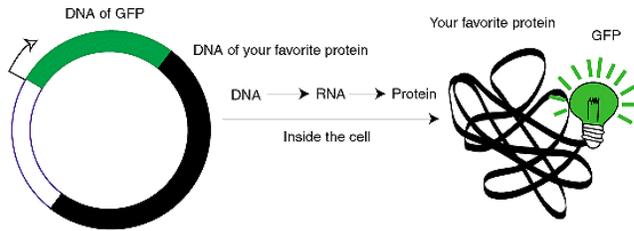


Cytotoxicity

III. Application

5. Transfection efficiency assessment

- Transfection is a method of inserting genes into eukaryotic cells and genes called 'reporter gene' such as GFP allow easy analysis of gene expressed after the transfection.
- Transfection efficiency is measured to enhance the delivery of gene into cultured cells without affecting the cell viability.



6. Coculture monitoring

- Coculture monitoring is analysis of cell-to-cell contact and it is the real time observation of changes in morphology caused by the interactions of two or more cells using live cell imaging.
- In order to distinguish the two cells, one cell is labelled with fluorescence and then cultured with other types of cell.



IV. Specification

IV. Specification

Specification

Dimension	211 x 146 x188 mm
Weight	3.2kg / 7.0lb
Objective Lens	4X / 10X
Imaging modes	Brightfield, Fluorescence (Green / Red)
Fluorescence	Green : Excitation (480/30x) / Emission (535/40m) Red: Excitation (540/25x) / Emission (575lp)
Light source	LED
Camera	1.25MP / 5MP CMOS
Stage	Manual XY, motorized Z
Imaging positions	1
File export format	TIFF, AVI (JPEG, PNG)
Culture vessels	Flask, dish, well plate, slide
Operating environment	5~40°C, 20~95% humidity
Power requirements	100-240V, ~50/60Hz
Output ports	Ethernet
Computer	External PC
O/S required	Window 10
Processor (recommended)	CPU 3G
Storage (recommended)	1TB
Monitor (Recommended)	1920*1080mm
Accessories	PoE adapter, ethernet cable, USB memory
Warranty	1 year

Ordering Information

Celloger Nano

Cat. No.	Description
CRCLG-NB04	Live cell imaging system (Bright field, 4X)
CRCLG-NB10	Live cell imaging system (Bright field, 10X)
CRCLG-NBG04	Live cell imaging system (Bright field + Green Fluorescence, 4X)
CRCLG-NBG10	Live cell imaging system (Bright field + Green Fluorescence 10X)
CRCLG-NBR04	Live cell imaging system (Bright field + Red Fluorescence 4X)
CRCLG-NBR10	Live cell imaging system (Bright field + Red Fluorescence 10X)

V. Celloger Series

V. Celloger series line up

CURIOSIS



	Celloger Mini	Celloger Mini Plus	Celloger Nano	Celloger Stack
Image mode	Bright-field	Bright-field, Fluorescence (Green/Red)	Bright-field, Fluorescence (Green/Red)	Bright-field
Automatic stage	O	O	X	O
Stage type	AutomaticXYZ moving	AutomaticXYZ moving	ManualXY, automaticZ moving	AutomaticXYZ moving
Focusing	Auto			
Magnification	4X	4X / 10X	4X / 10X	2X
Dimension	195*305*220mm	226*358*215mm	211*146*188mm	TBD
Weight	4.5kg	5.6kg	3.2kg	TBD
Operating environment	5-40°C temperature, 20-95% humidity			
End user price	\$19,500	\$29,000	\$9,500	TBD

Thank you

End of Documents