

Galatek

High Content Imaging System

Configuration Characteristics of
Galatek G-Cell



Satisfy requirements for
high-throughput, diverse types
and multi-application detection

**Capture the cellular world
with flexible and practical details**

Personalized

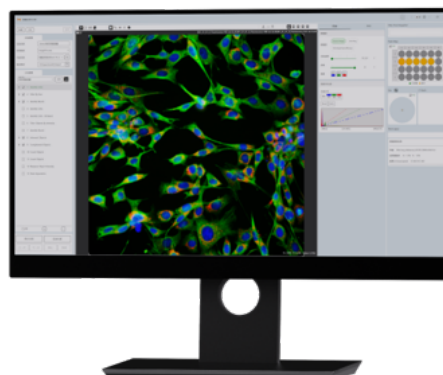
Platform-
based

Full-
featured

Upgrade-
able

Brief Introduction of Instrument

The Galatek G-Cell High Content Cell Imaging System uses a high-resolution CMOS camera with digital confocal algorithm in a flexible and user-friendly configuration to power ultra-high-performance high content imaging for your platform or laboratory.



Configuration Characteristics



Five-color fluorescence + color brightfield + digital phase contrast

Meet multiple observation and analysis needs



Fluorescent channel: Configuration of 4 LED + 1 laser

Weak phototoxicity, narrow bandwidth to prevent colour crosstalk



High-resolution CMOS + digital confocal

Greatly improves sensitivity and clarity



Infrared laser/image-based autofocus

Fast focusing on complex consumables, samples



Stage with sub-micron resolution and high precision

Fine viewing, adjustable movement speed



Wide field imaging

The field of view area under a 20x objective is 0.9 mm × 0.9 mm



Fast imaging

The 96-well plate imaging time of the 96-well plate with single-field dual-channel is less than 2.5 minutes



Extensive research dimensions

Supports Z-stacking, time-series imaging, and flexible selection of field of view



Compatible with multiple consumables

6-1,596 well plates, culture dishes, slides and chambers



Diverse objective lens options

2x-60x, optional with high NA plan apochromatic objectives and long working distance objectives are available

Product Features

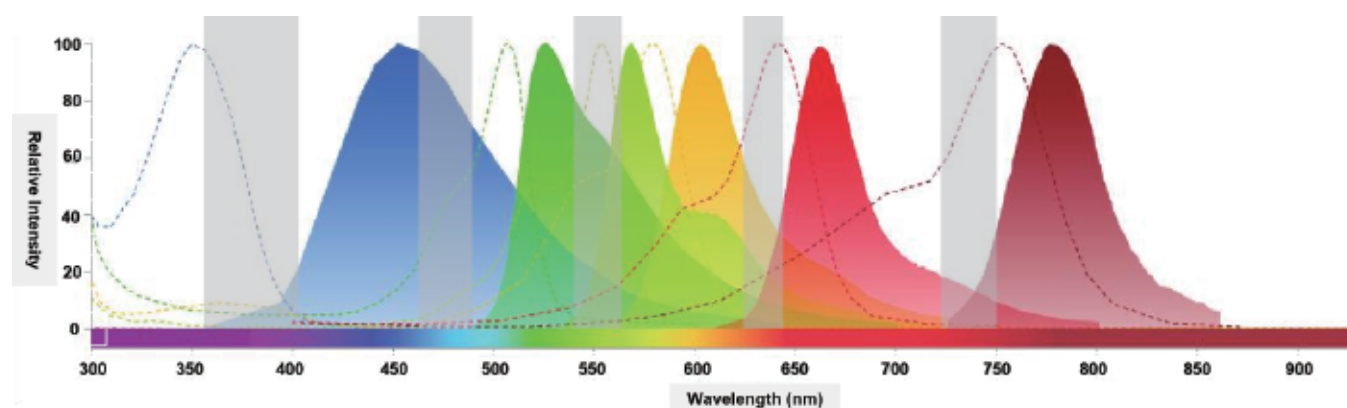
High cost-effective

Practical and user-friendly

Highly configurable

Continuous upgrades

Fluorescent Channel Configuration



Channel Wavelength (nm)	405	488	561	638	730
Excitation Range (nm)	357-405	461-488	543-566	625-646	719-750
Emission Range (nm)	412-450	498-531	578-612	660-702	766-849

Live-Cell Module — Precise Environmental Control for Steady-State Long-Term Imaging

Full-Cycle Environmental Regulation

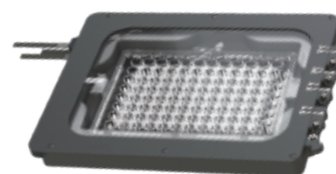
Triple-parameter precision control of temperature, humidity, and CO₂ concentration to maintain an optimal cell culture microenvironment

Long-term live cell culture

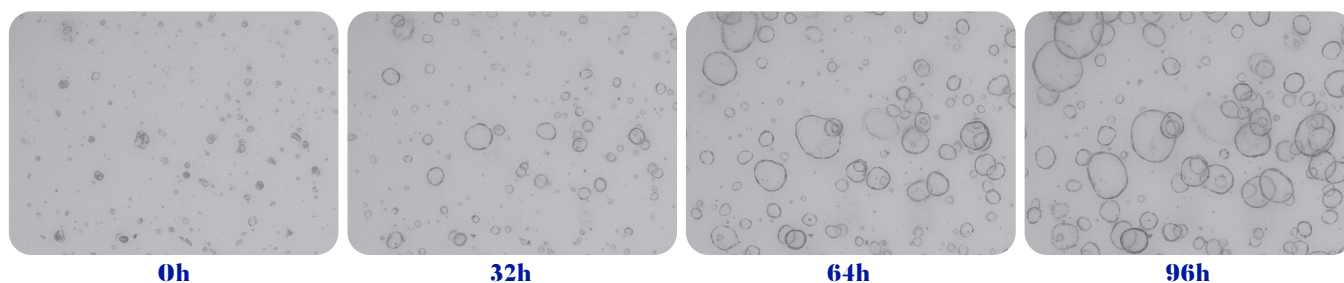
Supports stable cell growth for days to weeks

Undisturbed Data Acquisition

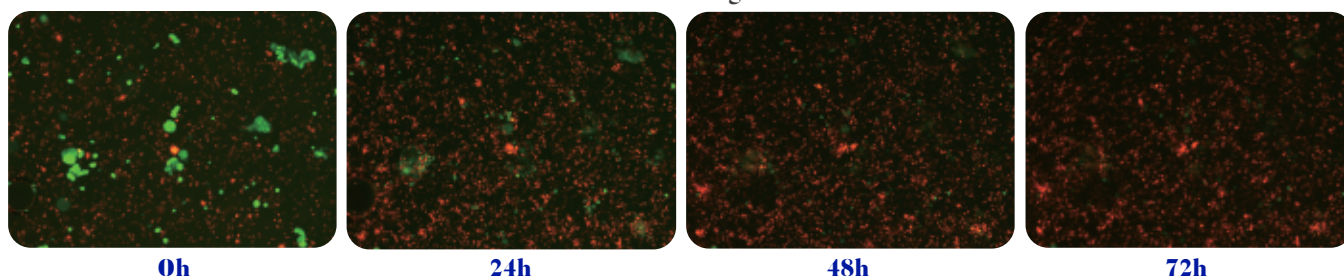
Enables synchronized image data acquisition with CelIVue® T2000 for effortless collection of continuous, complete, undisturbed dynamic data



Gastric Cancer 3D Cell Culture — 96-Hour Growth Monitoring



PBMC-Gastric Cancer 3D Co-Culture — 72-Hour Monitoring

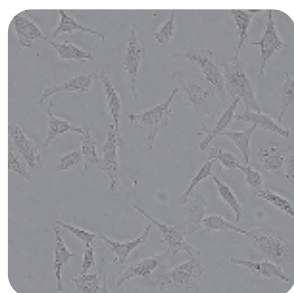


Vybrant™ DiI 3D Cell Labeling Solution (red labeling of **PBMCs**);
CellTracker™ Fluorescent Probes (green labeling of **gastric cancer 3D cells**)

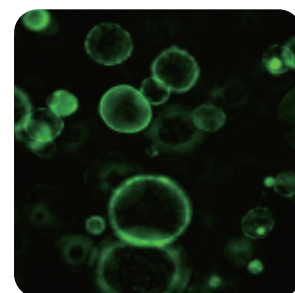
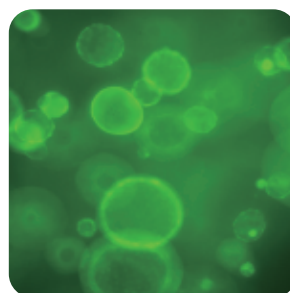
Smart, Independent, and Scalable Analysis Software

Powerful Image Post-Processing

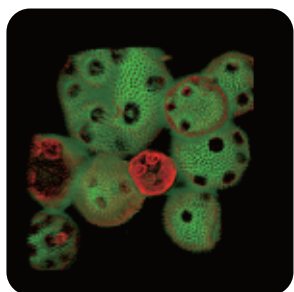
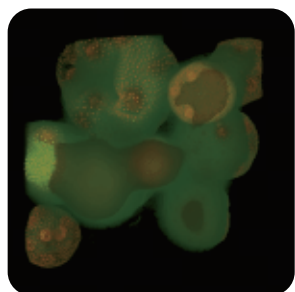
CellVue provides a variety of image background processing functions, including flat-field correction, background normalization, background subtraction, etc. It supports deconvolution processing, local signal enhancement to suppress background interference and improve signal-to-noise ratio, enables image stitching and adaptive background correction to eliminate stitching seams, and offers Z-stack scanning with multiple projection modes such as extended depth of field and maximum intensity projection. CellVue also supports multi-channel merging of brightfield and fluorescence images, and allows real-time image post-processing during acquisition.



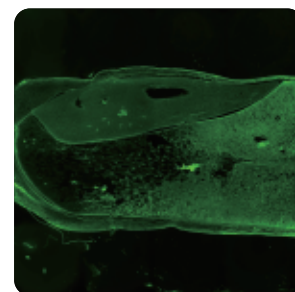
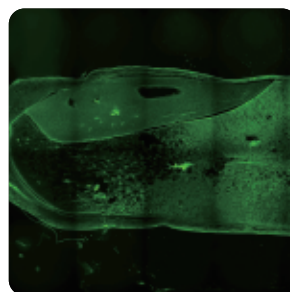
Background normalization



Background subtraction



Digital confocal (deconvolution)



Background correction

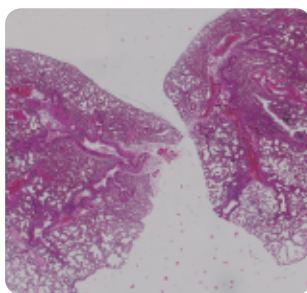
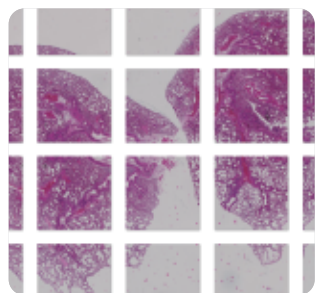


Image stitching

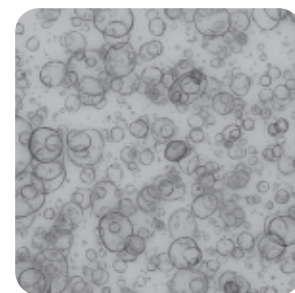
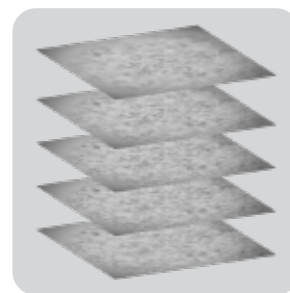


Image projection

AI-based Target Recognition and Analysis

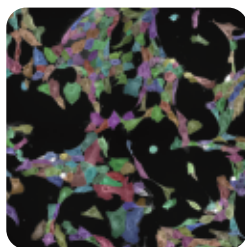
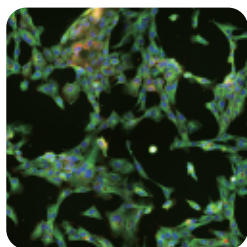


Image analysis

Image acquisition, image processing, target recognition

Data analysis

Feature measurements, result files, data visualization

Flexible Definition of Analysis Process

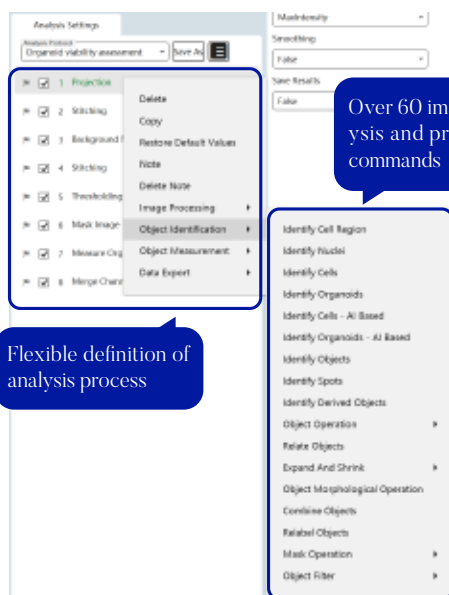
Over 60 image processing and analysis function modules, with continuous expansion and upgrades, covering image processing, target recognition, feature measurement, and more. The analysis process can be flexibly defined by freely combining and reordering to adapt to diverse research applications.

AI Image Recognition Algorithms

Based on AI algorithms such as deep learning, it overcomes the limitations of traditional analysis, improving the accuracy and robustness of object recognition and segmentation, and providing precise morphological and spatial information for subsequent analysis. Custom AI models can be trained for specific samples and applications, delivering intelligent, efficient, and precise image extraction tailored to diverse application scenarios.

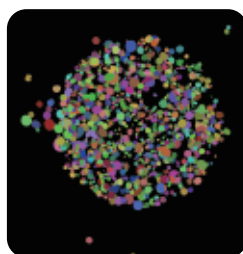
Comprehensive Feature Measurements

Powerful multi-dimensional data analysis capabilities. It extracts dozens of feature information from samples, including morphological, intensity, and texture features. It transforms complex images into structured, traceable, and quantifiable data, providing objective and quantitative basis for research analysis.

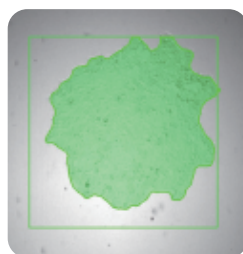


Over 60 image analysis and processing commands

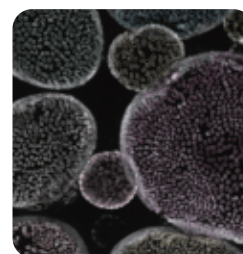
Flexible definition of analysis process



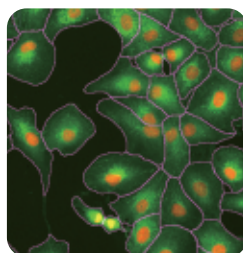
3D Cell morphology measurement



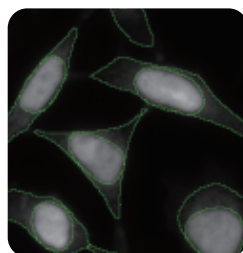
Cell colony identification



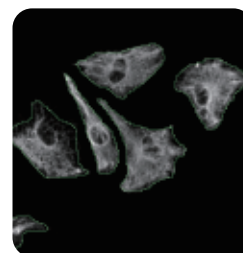
3D cell and nucleus recognition



Cell recognition & segmentation

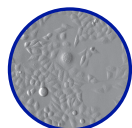


Cellular fluorescence intensity measurement



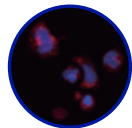
Fibrotic cell texture analysis

Applications



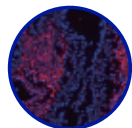
Brightfield imaging

- Cell confluence, cell migration, live cell observation
- Supports digital phase contrast, label-free analysis



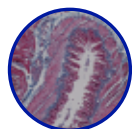
Cell fluorescence

- Cell proliferation/apoptosis/cycle, cell function/drug screening
- Weak signal detection, supporting cell counting, transfection efficiency analysis



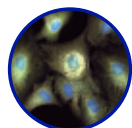
Section sample

- Coverslips, sample slides
- Supports global image stitching and Z-stacking



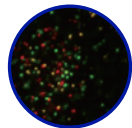
Color brightfield

- HE staining, Oil Red O staining, immunohistochemistry, and plant biology
- Supports RGB-mode color brightfield imaging



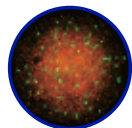
Cell painting

- 5 fluorescent channels, upgradeable configuration
- Multiple staining to analyse cellular phenotypic differences



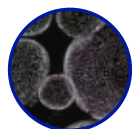
Spatial omics

- Spatial proteomics
- Thoroughly characterizing cells to reveal the diversity of protein activities



Cell spheroids

- Multi-mode autofocus, long-term live-cell imaging
- Channel-independent offset, bidirectional Z-stacking, multiple projection modes



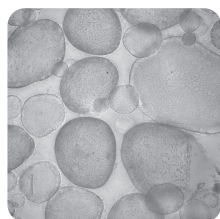
3D cells

- Whole-well stitching images, projection images, and brightfield viability assay
- Supports background correction, subtraction, and 3D intracellular nucleus counting

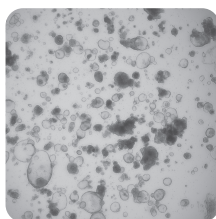
Application Case 1: 3D Cell Research

3D cells are three-dimensional structures formed from stem cells or tissue cells cultured in vitro, which closely resemble the structure and function of real organs. They are widely used in disease modeling, drug screening, and toxicity testing to support precision medicine, providing personalized models for cancer research and the analysis of genetic disease mechanisms to reduce reliance on animal experiments. Meanwhile, 3D cells also serve as potential transplantable materials for regenerative medicine, advancing tissue repair and organ reconstruction, which are important innovative tools in the field of biomedicine.

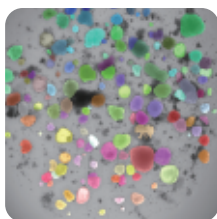
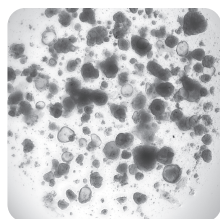
Imaging & AI Recognition of 3D Cells



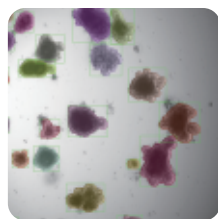
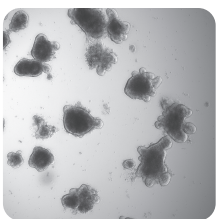
Liver 3D cells



Kidney 3D cells

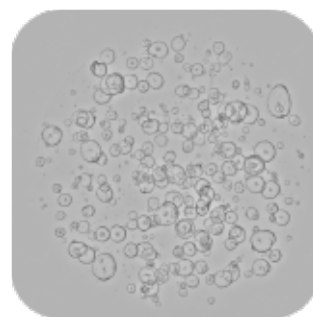


Ovarian cancer 3D cells

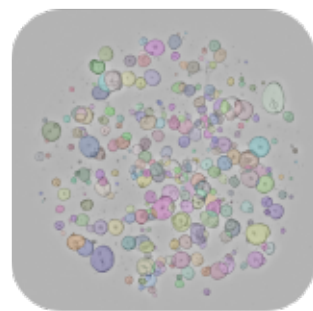


Small intestinal 3D cells

24-well plate (projection + stitching)

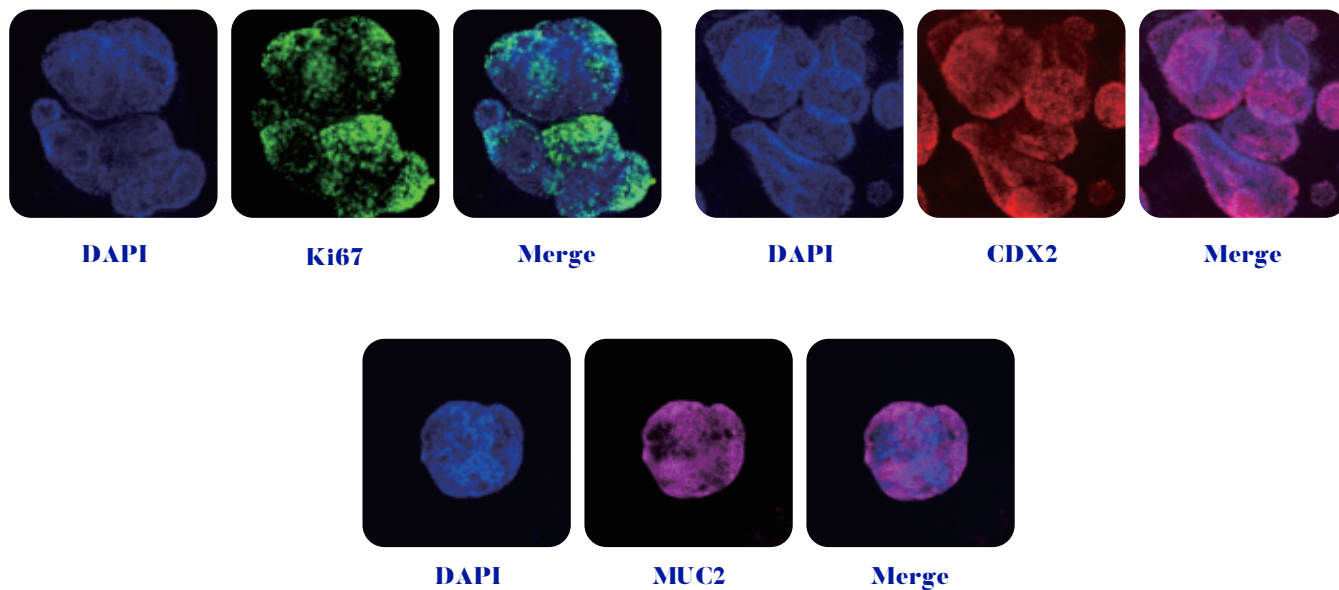


Recognition result



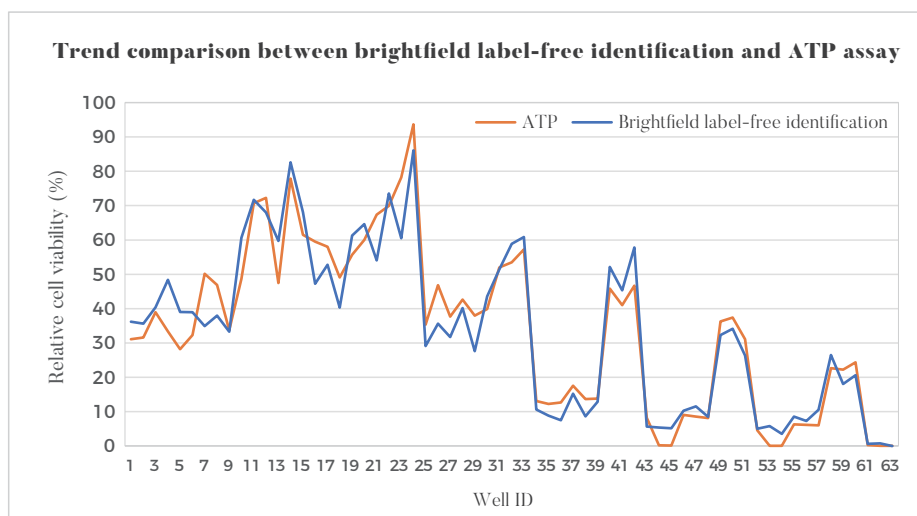
Gastric 3D cells

3D Cell Model Construction Test (iPSC Colon 3D Cells)

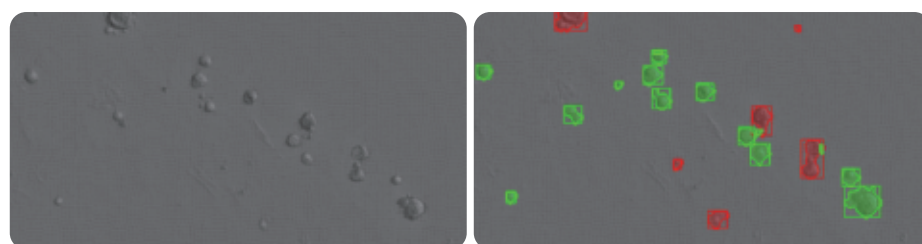


Ai-Based Label-free Analysis

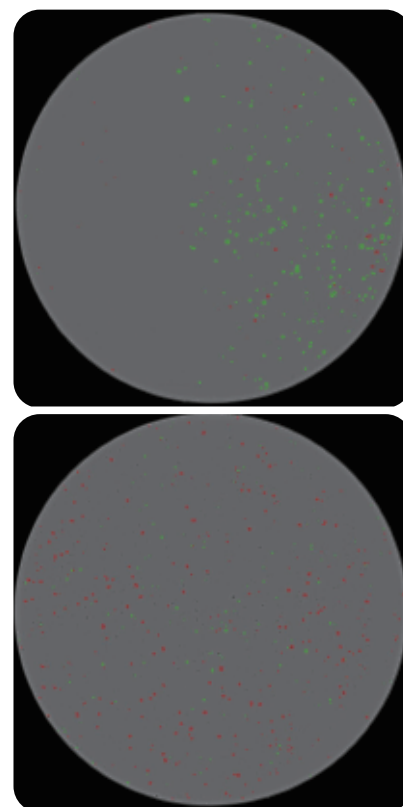
Response to customized requirements



Whole-plate processing, trend comparison between brightfield identification results and ATP assay results



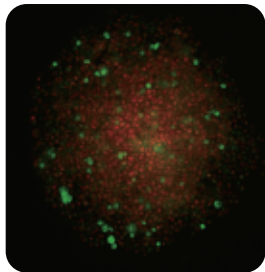
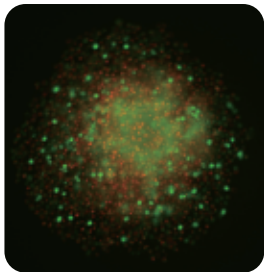
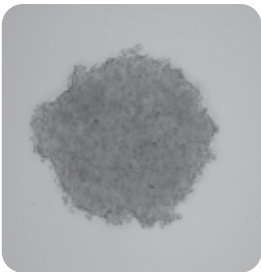
10x, 96-well plate, 4x4 sites
40 planes of Z-stack, stitched after projection



Application Case 2: Drug Screening

G-Cell enables high-throughput, automated microscopy combined with multiparametric quantitative analysis for precise evaluation of cell morphology, phenotype, and substructures. In drug screening, it simultaneously evaluates the efficacy, toxicity and mechanism of action of compounds, enhancing screening efficiency and data depth, accelerating target validation and lead compound optimization, and enabling multidimensional analysis of complex disease models to advance precision drug development.

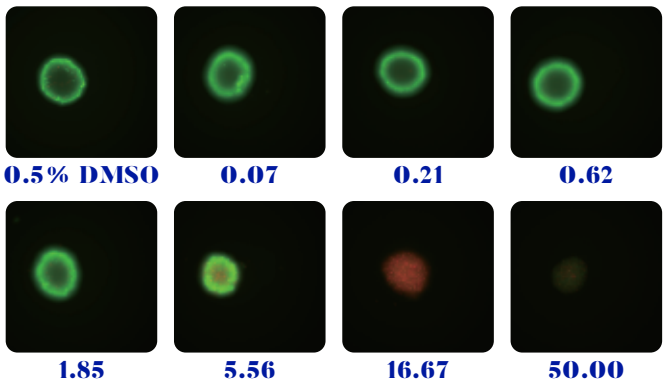
Drug Toxicity Test on 3D Cell Spheroids



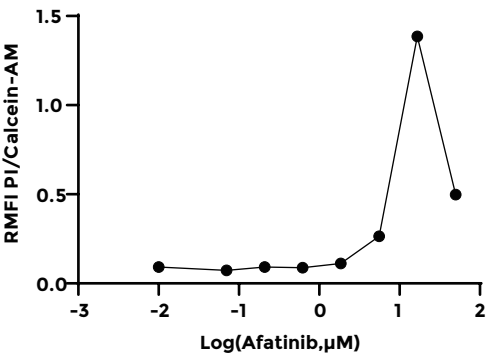
Live Cells (Calcein-AM, excitation 488 nm) & Dead cells (PI, excitation 561 nm)

● Test 1: Afatinib

μM



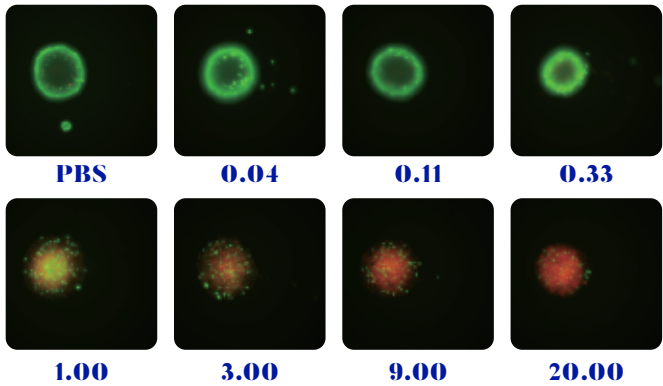
3D cell spheroids recognition and mean fluorescence intensity analysis



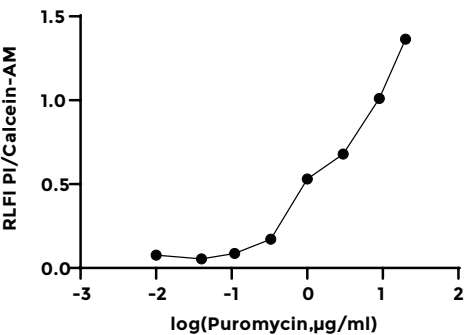
Dose-response curve of Relative Mean Fluorescence Intensity (RMFI) vs. Afatinib concentration

● Test 2: Puromycin

μg/ml



3D cell spheroids recognition and mean fluorescence intensity analysis

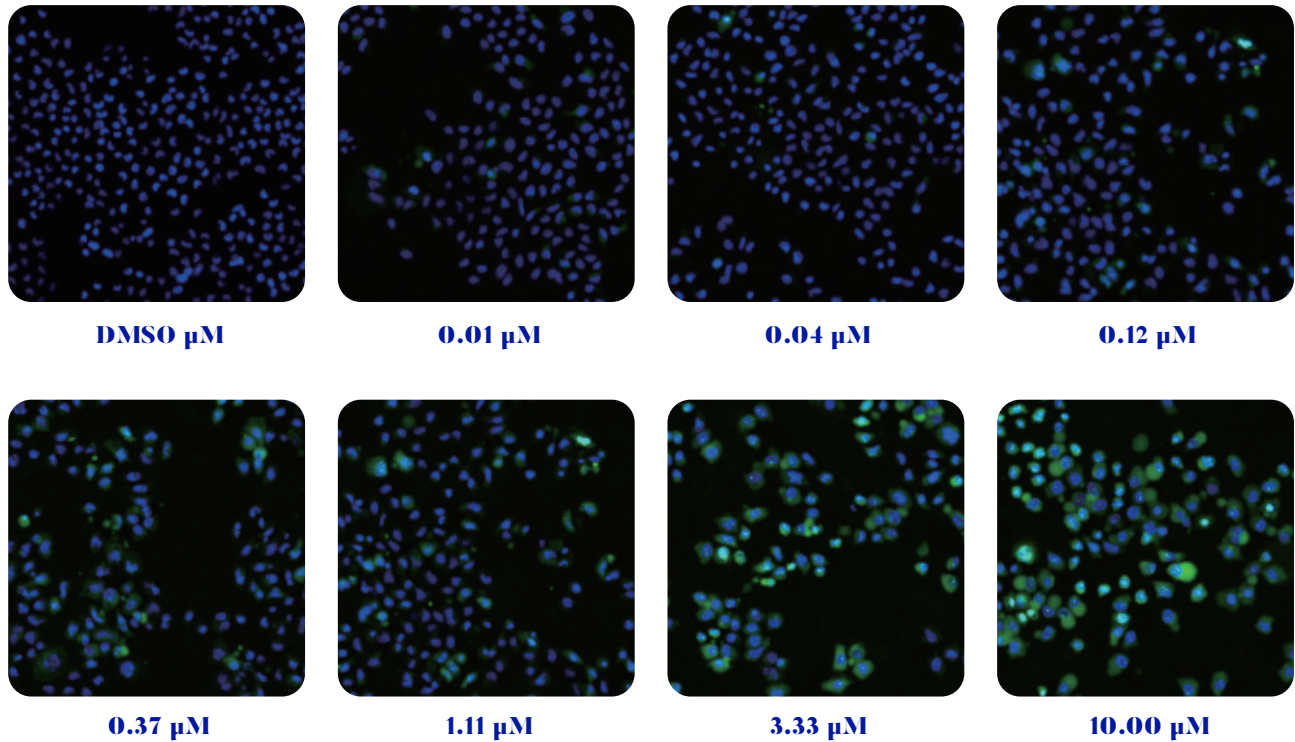


Dose-response curve of Relative Mean Fluorescence Intensity (RMFI) vs. Puromycin concentration

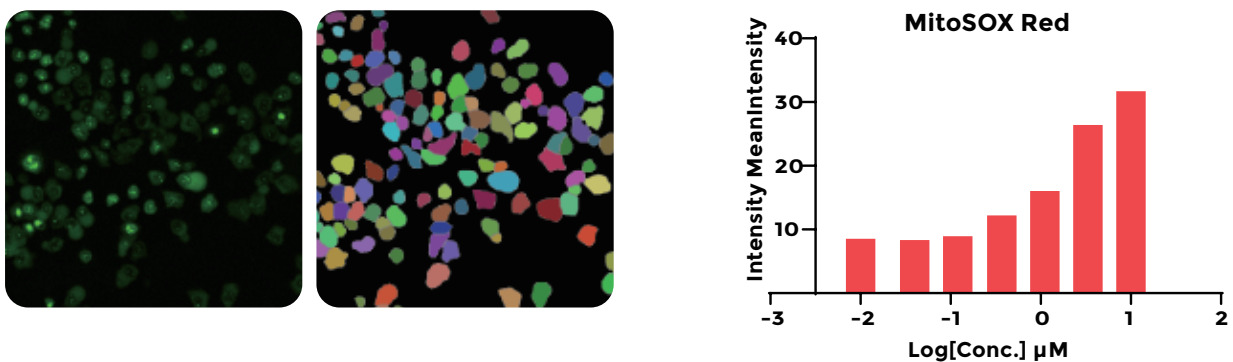
Mitochondrial Reactive Oxygen Species (MitoROS) Assay

HeLa cells were used to study mitochondrial activity. Intervention with the mitochondrial respiratory chain inhibitor (Rotenone) induced mitochondrial dysfunction, followed by imaging and analysis of MitoROS levels.

Hoechst 33342 (blue, 405 nm) & MitoSOX Red (green, 561nm)



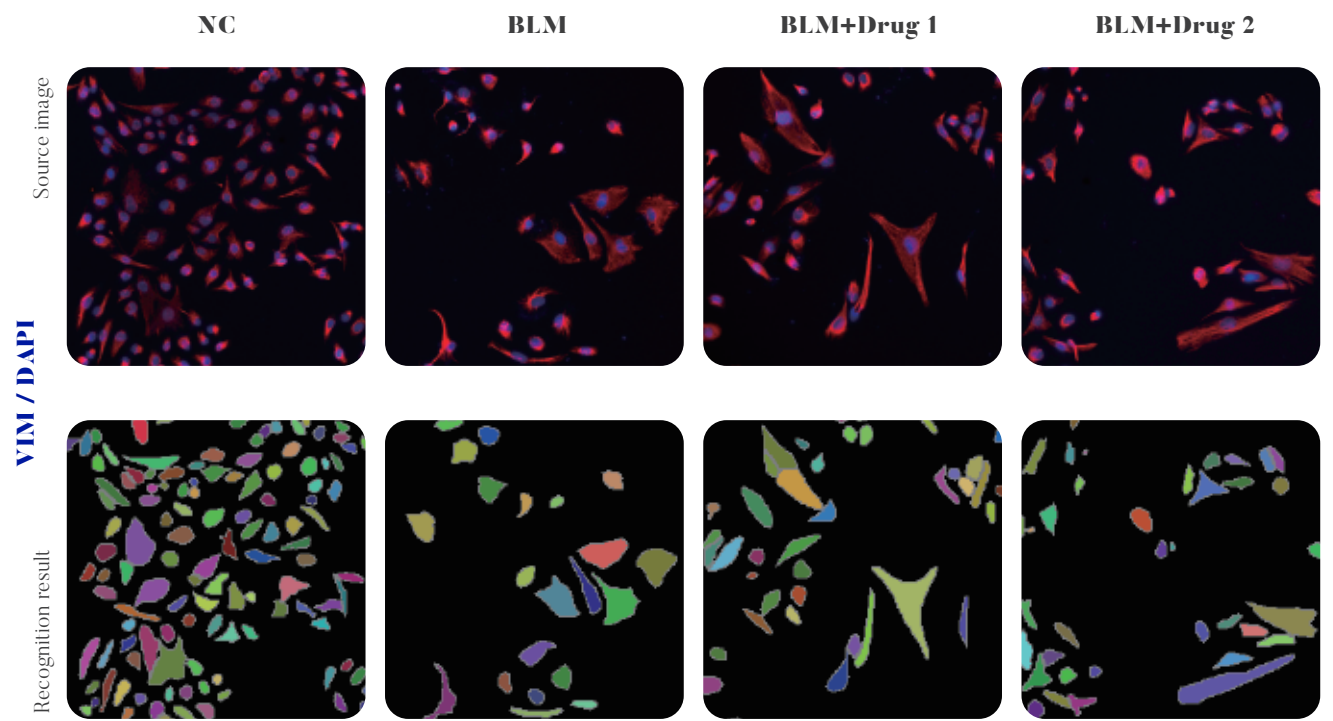
Rotenone treatment for 24 hours caused a concentration-dependent increase in MitoROS



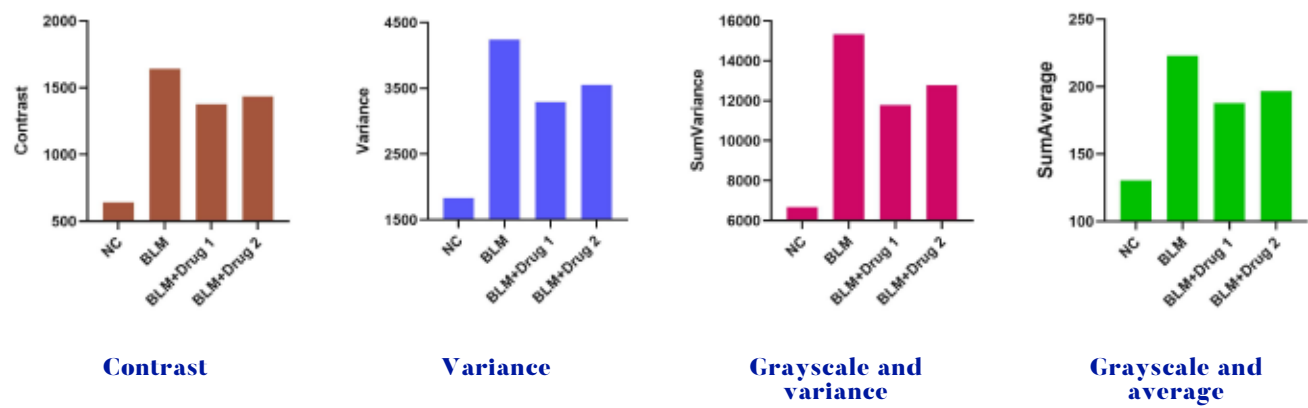
Recognize 3D cell spheroids and calculate mean fluorescence intensity

Anti-Fibrotic Effects of a Traditional Chinese Medicine(combination drug)
on AT2 Cells Observed by G-Cell

CellVue enables clear visualization of cellular texture details and quantitative analysis of fibrosis via texture feature measurements. The fibrosis-induced group (+BLM) showed significant changes in fibrosis-related image texture features, including contrast, grayscale and variance, grayscale and average, variance, etc., indicating pronounced fibrosis. However, treatment groups (+Drug1, +Drug2) exhibited texture features closer to the NC group, suggesting that Drug1 and Drug2 alleviated the progression of cellular fibrosis to some extent.



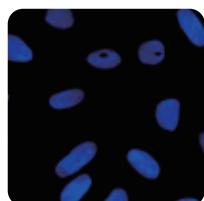
Texture Analysis Results



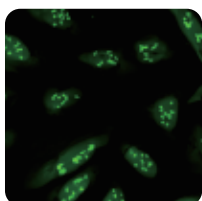
Application Case 3: Cell Painting

The rise of high-content screening technologies has rapidly advanced research in etiology, mechanism, and toxicology. Given that 7–18 % of FDA-approved drugs lack clear molecular targets, and considering off-target effects and multi-gene diseases, target-driven drug discovery (TDD) is not always safe or effective.

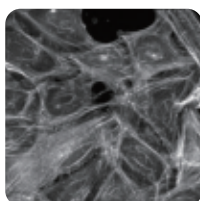
With the development of artificial intelligence, Cell Painting leverages machine learning to extract biological information, surpassing classical methods. It precisely captures high-quality, multidimensional features of single cell, and efficiently supports phenotype-driven drug discovery (PDD).



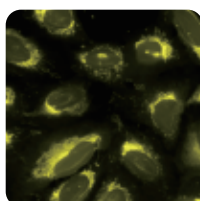
Cell nucleus



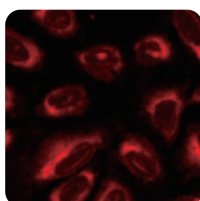
**Nucleoli /
Cytoplasmic RNA**



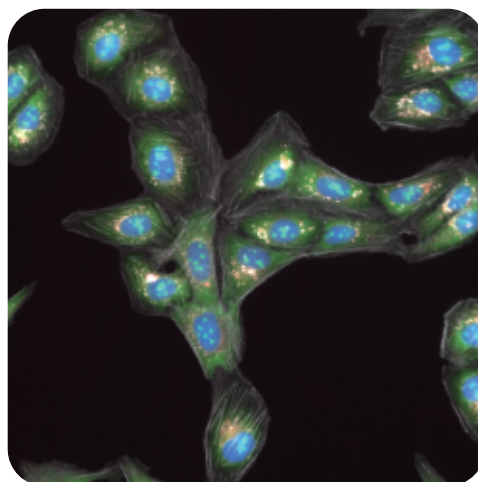
**Actin /
Golgi apparatus**



Mitochondria



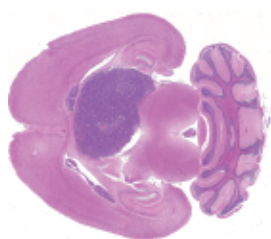
**Endoplasmic
reticulum**



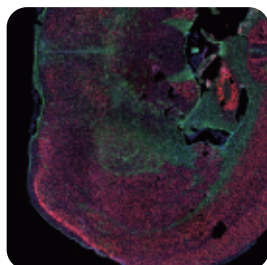
Cell painting morphological features

Application Case 4: Tissue Slides

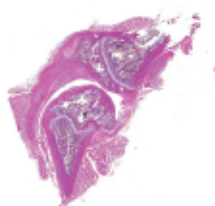
Compatible with both high-throughput plate scanning and slide scanning; color brightfield imaging supports a wide range of applications.



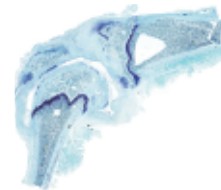
HE staining of mouse brain sections:
10x, 8x7 sites stitching



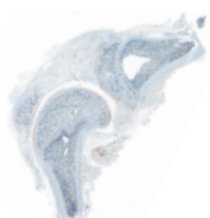
Mouse brain sections, 4-channel fluorescence merge,
40x, 15x15 sites stitching



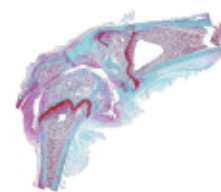
H&E staining
Observation on the overall
structure of cartilage tissue



Toluidine blue staining
Detection of acidic mucopolysaccharide
in cartilage matrix



COL2 immunohistochemical staining
Observation of cartilage injury



Safranin O-Fast Green staining
Specific distinction of cartilage
and fibrous tissue

Observation of cartilage tissue samples on slides

Expansion Module



Optional environmental control module to regulate temperature, humidity, and CO₂ concentration, providing a suitable growth environment for live cells and meeting the long-term observation and imaging needs of live cells;



Supports high throughput, equipped with MegaRobo self-developed platform, truly unattended, providing customers with a comprehensive overall solution;

Configuration	Parameters
Optical system	Widefield imaging
Imaging modes	Brightfield, color brightfield, fluorescence, digital phase contrast
Imaging methods	Single-color, multicolor, time-series, Z-stacking, large image stitching
Fluorescent channels	5 channels (405 nm, 488 nm, 561 nm, 638 nm, 730 nm)
Light source	LED or laser (Optional)
Camera	CMOS
Camera resolution	4,024 x 3,036 (12 MP)
Pixel size	1.85 μ m
Camera frame rate	31 fps
Objective magnification	20x NA0.8, options for 4x/10x/40x/60x/100x
Stage travel	80 mm Y 120 mm Z 6 mm
Stage repeatability	X/Y 0.4 μ m, Z 0.1 μ m
Max. stage speed	X/Y 50 mm/s
Consumable types	6-1,536 well plates, culture dishes, slides
Focusing modes	Infrared laser focusing, image focusing
Dimensions	555 x 325 x 420 mm
Operating environment	Temperature 5°C - 40°C, Humidity $\leq$ 80 %
Live cell culture module	Optional
Integrated into automation system	Support

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Declaration

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