

Galatek

G-Cell High Content Imaging System

Galatek Intelligent Automation Solutions



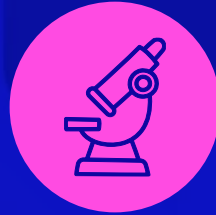
1000+

collaborators



60%

R&D personnel



1000+

Patents



230+

Integrated Device Models

Powering Breakthroughs in Science

What We Do

Galatek combines precision **engineering**, **robotics**, and **AI-native software** to deliver intelligent automation across life sciences, applied chemistry, semiconductors and sustainable energy—where precision, reproducibility, and data integrity are paramount.

Our Mission

To help scientists and engineers accelerate industrial innovation **through flexible, AI-driven automation built around real-world workflows**.

Where We Operate

Headquartered in Singapore, with R&D, delivery, and service teams across the US, Europe, and Southeast Asia

—We pair **global scale** with local execution.



USA
Regional Marketing Center
Demo Lab | AI Research Center

Germany
Regional Headquarters
Regional Marketing Center

Singapore*Malaysia
Corporate Headquarters
R&D Center | Production & Delivery Center

China
Supply Chain Center

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G-Cell High Content Imaging System

1. INTRODUCTION

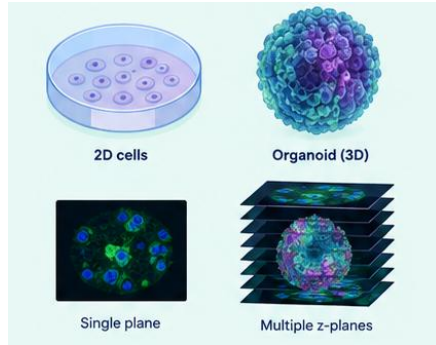
Common Challenges in Organoid Imaging



Manual acquisition reduces throughput and limits scalability

Scientists often need to **inspect images during or after acquisition** to verify focus, exposure, staining and morphology.

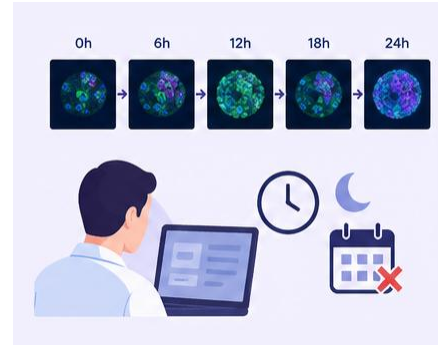
Poor-quality images may only be discovered after acquisition, **requiring re-imaging or sacrificing data**.



Complex 3D models require more imaging decisions

Organoids can vary substantially in size, shape, position and optical properties.

Selecting the appropriate focal plane, imaging depth, field of view and z-stack can therefore require manual intervention and may vary from organoid to organoid.



Time-lapse experiments can be limited by scientists

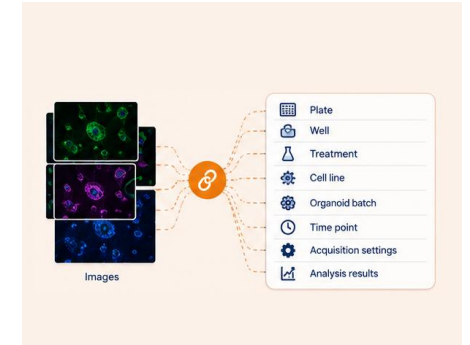
Experiments requiring imaging overnight, over weekends or at frequent time points depend on someone being **available to start, monitor or adjust the acquisition**.

As a result, researchers may reduce the number of time points or **miss critical events**.



Manual image analysis limits scalability

Scientists can spend significant amounts of time **reviewing images, segmenting cells or organoids, classifying phenotypes, and extracting quantitative features**. Manual analysis can introduce user-to-user variability and limits the amount of data that can be processed.



Connecting images to experimental metadata

Images need to remain associated with the correct plate, well, treatment, cell line, organoid batch, time point and acquisition settings.

Maintaining traceability across large experiments and multiple imaging sessions can thus **becomes error-prone**.

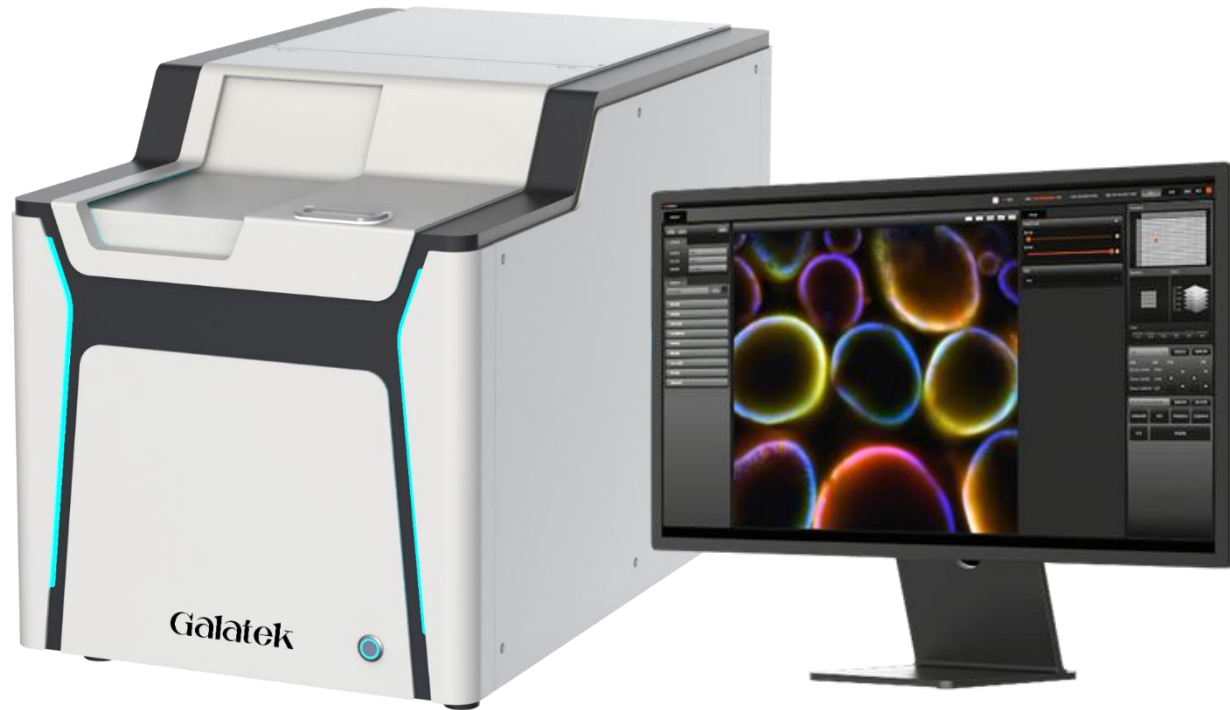
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G-Cell High Content Imaging System

2. KEY FEATURES

Our High Content Imaging System

G-Cell High Content Imaging System



All-In-One System:

High throughput

Automatic imaging

Live cell imaging

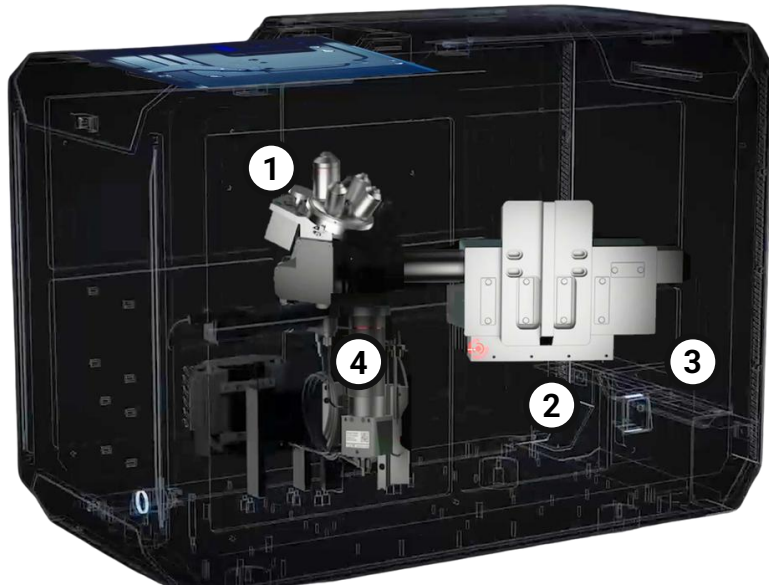
Confocal imaging

Imaging processing

Quantification analysis

Main Features & Modules

G-Cell T3000 Confocal



① Wide range of objective lens types

4-position automated turret (objective changer)
Options for: 2x, 4x, 10x, 20x, 40x, 60x
Optional high NA plan apochromatic (APO)
objectives and long-distance objectives

② Rotating disk confocal microscopy

③ Light sources

Brightfield: white LED
Fluorescence: 5 laser (405, 488, 561, 638, 730 nm)

④ sCMOS camera

Camera frame rate: 110 fps frame rate
High quantum efficiency and SNR
High capacity to capture ultrafast dynamic signals

G-Cell T2000 Widefield

① Wide range of objective lens types

4-position automated turret (objective changer)
Options for: 4x, 10x, 20x, 40x, 60x
Optional high NA plan apochromatic (APO)
objectives and long-distance objectives

③ Light sources

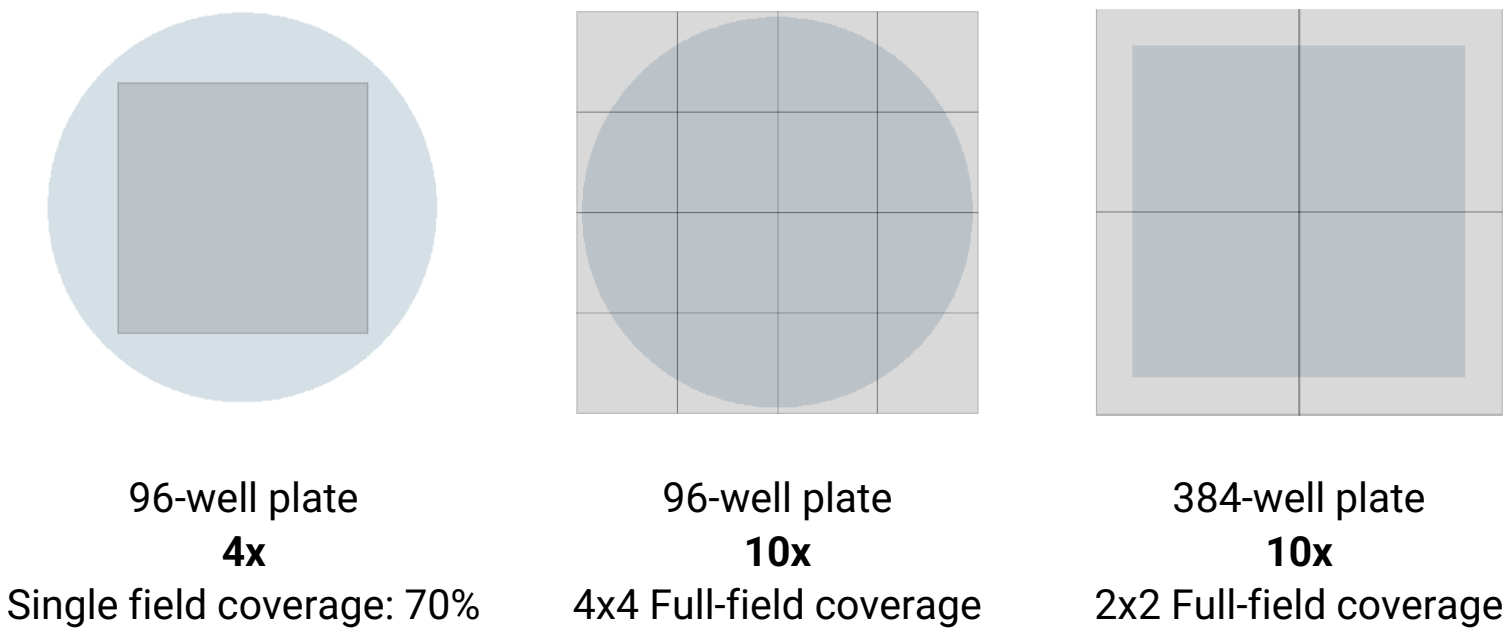
Brightfield: white LED
Fluorescence: 5 LED (405, 488, 561, 638, 730 nm)
+ optional solid-state laser light source for the
561 nm

④ CMOS camera

Camera frame rate: 31 fps frame rate
High quantum efficiency and SNR
High capacity to capture ultrafast dynamic signals

G-Cell Features a Large Field of View (FOV)

For large-area image stitching, G-Cell requires fewer shots to capture the scene, significantly shortening the acquisition time



Lens objective	G-Cell FOV
4x	4.00 x 4.00
	16.00 mm ²
10x	1.60 x 1.60
	2.56 mm ²
20x	0.90 x 0.90
	0.64 mm ²

G-Cell Enables Autofocus

Laser- and image-based autofocus enables reliable focusing across complex samples and various consumables, ensuring high-quality imaging

Laser auto-focus

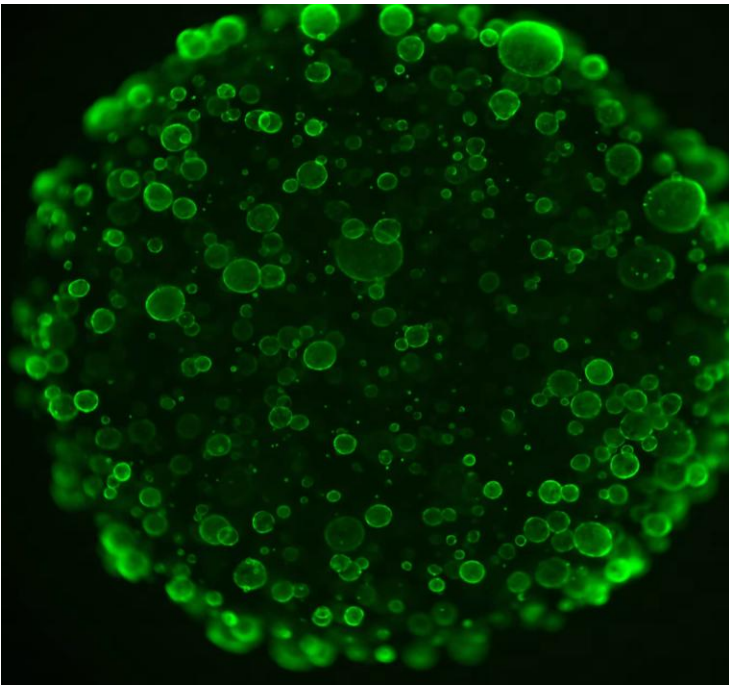
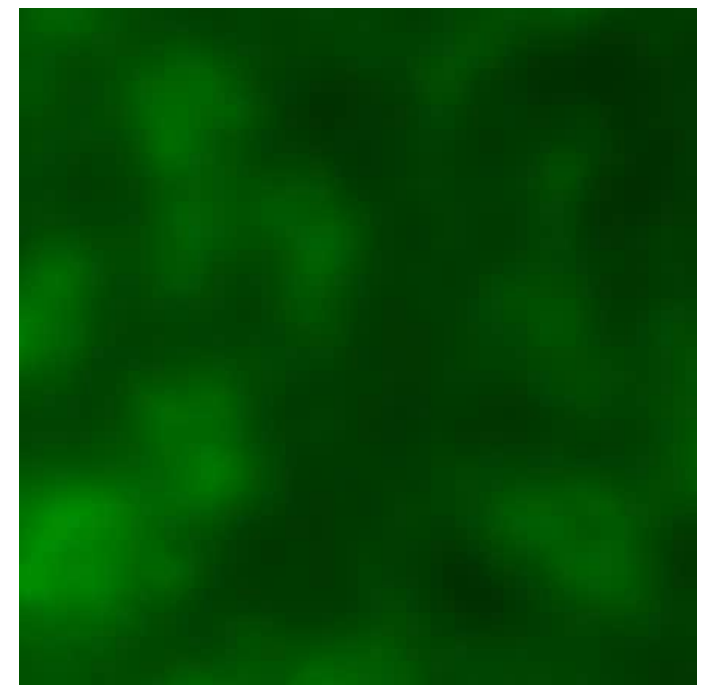
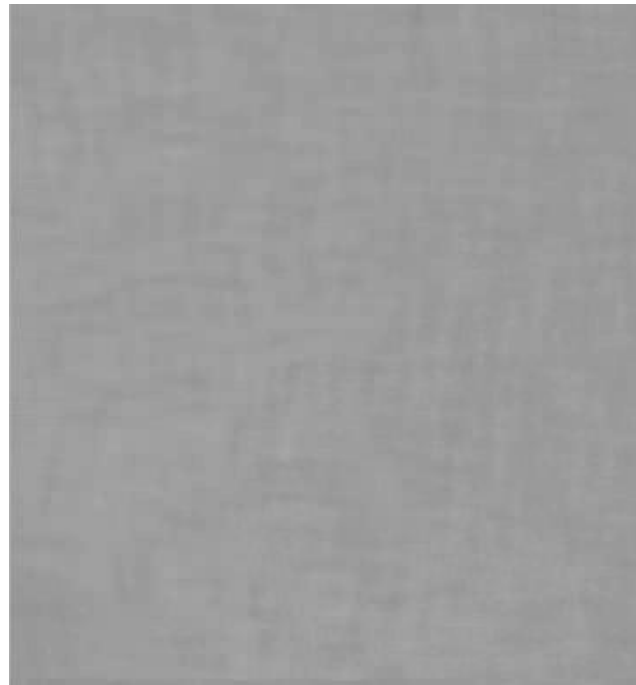


Image-based auto-focus



G-Cell Offers High-Speed Image Acquisition



Fast-moving stage



Large FOV



Laser auto-focus

Consumable	Channel number	Auto-focus	Image acquisition time
384	2	Laser	8 min (Widefield)
			< 20 min (Confocal)
384	5	Laser	10 min (Widefield)
			< 30 min (Confocal)
96	2	Laser	< 2 min 30 s
96	5	Laser	3 min

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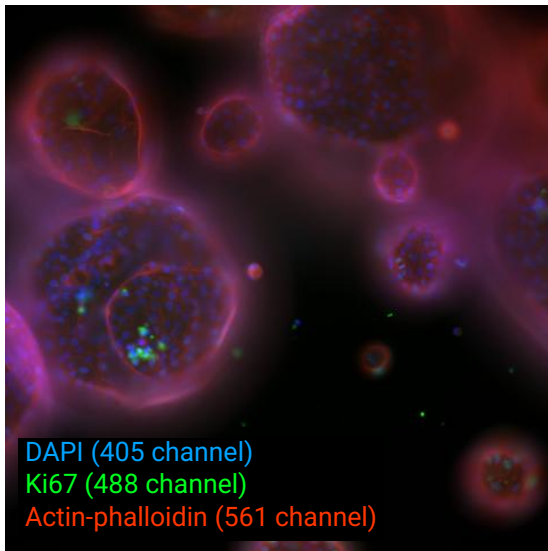
3. CAPABILITIES

G-Cell Delivers High-Quality Imaging

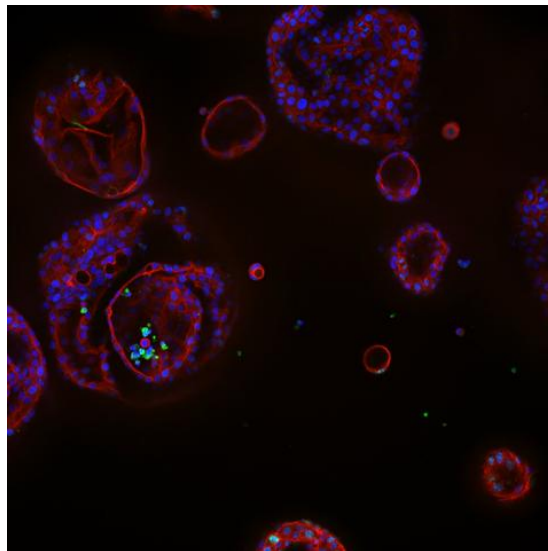
Eliminate interference from non-focal plane signals and enhance optical slicing capabilities

GCO organoid samples:

Single-plane imaging

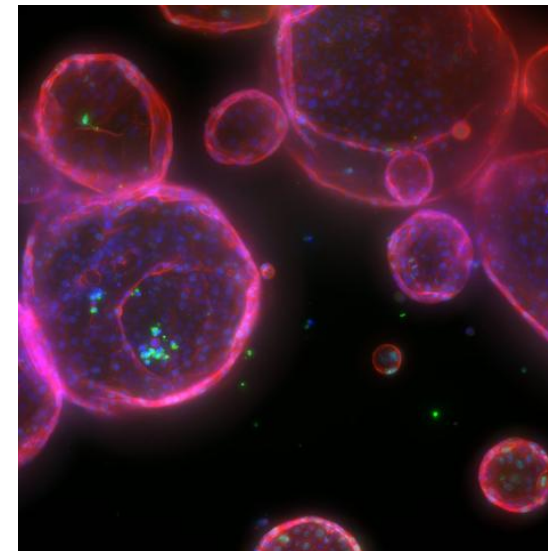


Wide-field

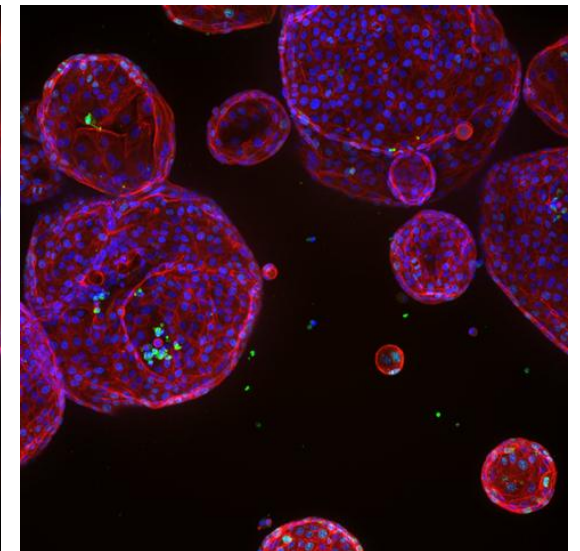


Confocal

Z-stack projection



Wide-field



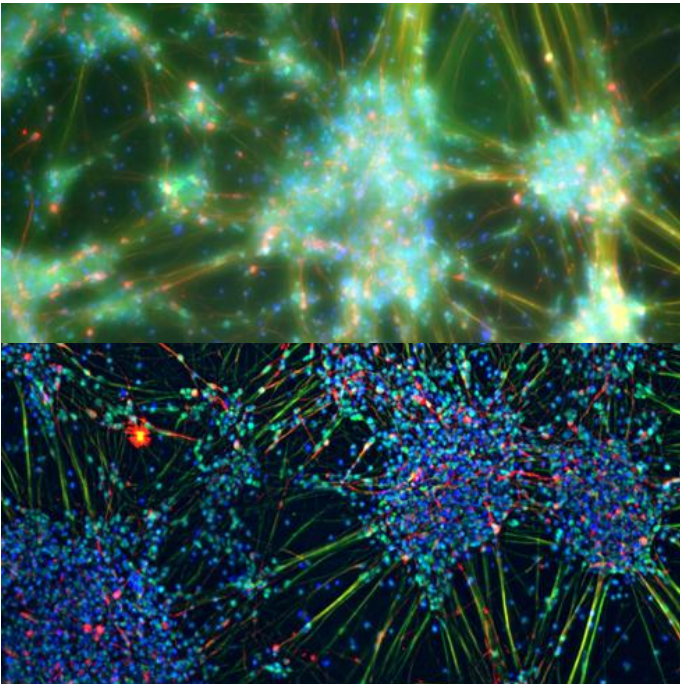
Confocal

G-Cell Supports Powerful Image Post-Processing

Widefield Image Deblurring Algorithm

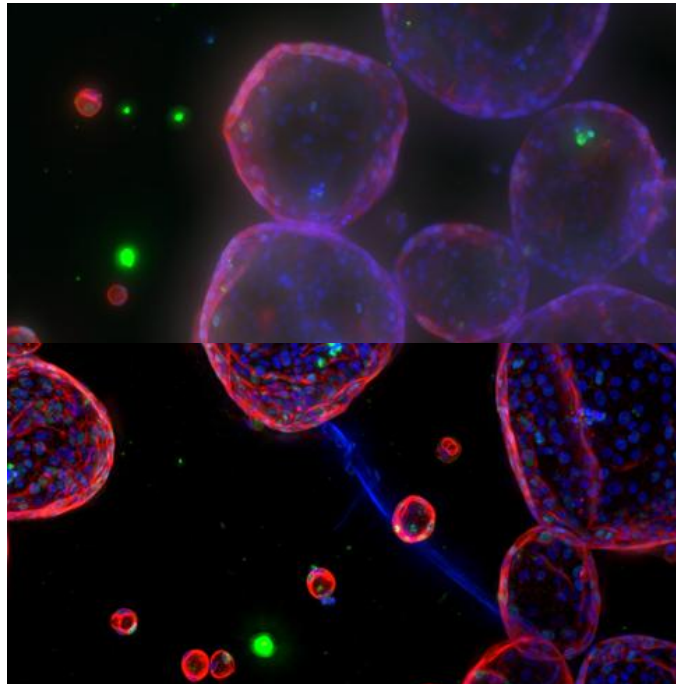
Background removal & Local signal enhancement

Suppression of out-of-focus signals, reduction of background noise, and improved signal-to-noise ratio.



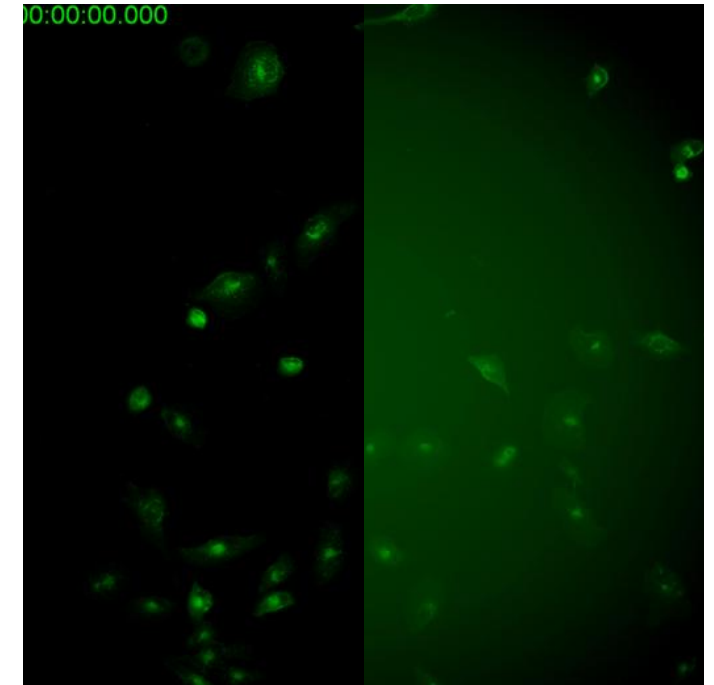
Nerve cells — 20x

Z-stack maximum intensity projection



Organoids — 20x

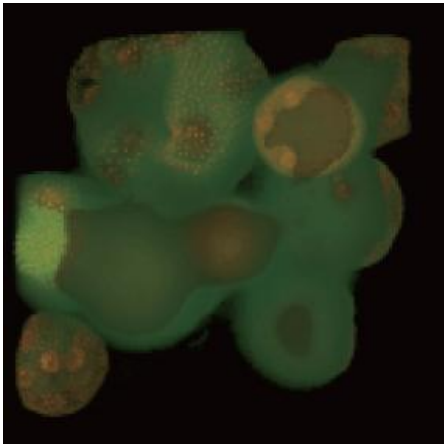
Z-stack maximum intensity projection



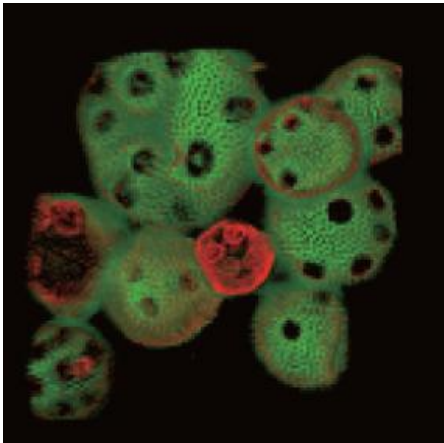
Cell migration — 20x

G-Cell Supports Powerful Image Post-Processing

Digital Confocal
(Deconvolution)

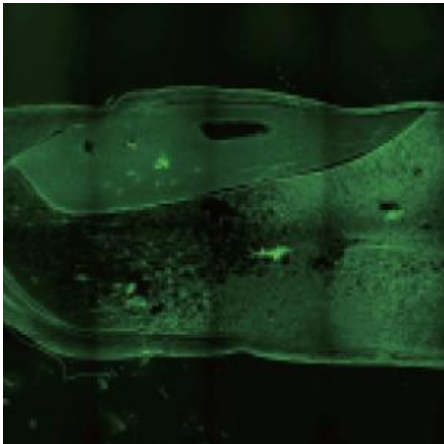


Before

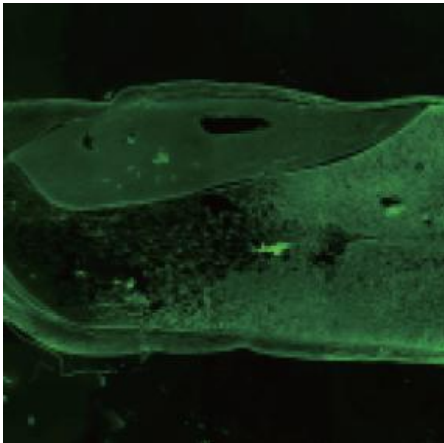


After

Background
Correction

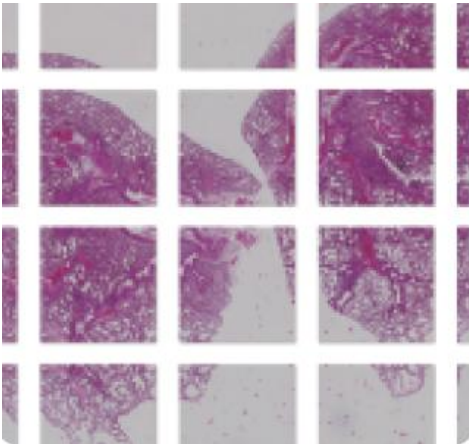


Before

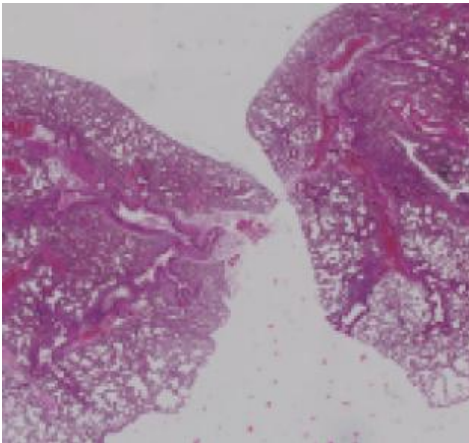


After

Image
Stitching



Before



After

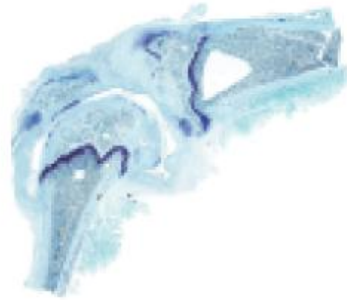
G-Cell Supports High-throughput Plate & Slide Scanning

Observation of cartilage tissue samples on slides



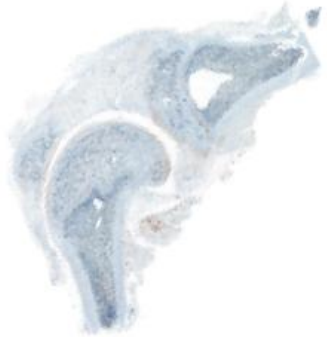
HE staining

Observation on the overall structure of cartilage tissue



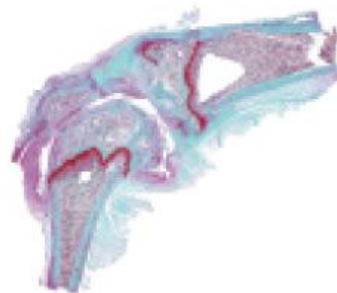
Toluidine blue staining

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

G-Cell Enables Live-Cell Monitoring

Continuous culture and observation of live cells

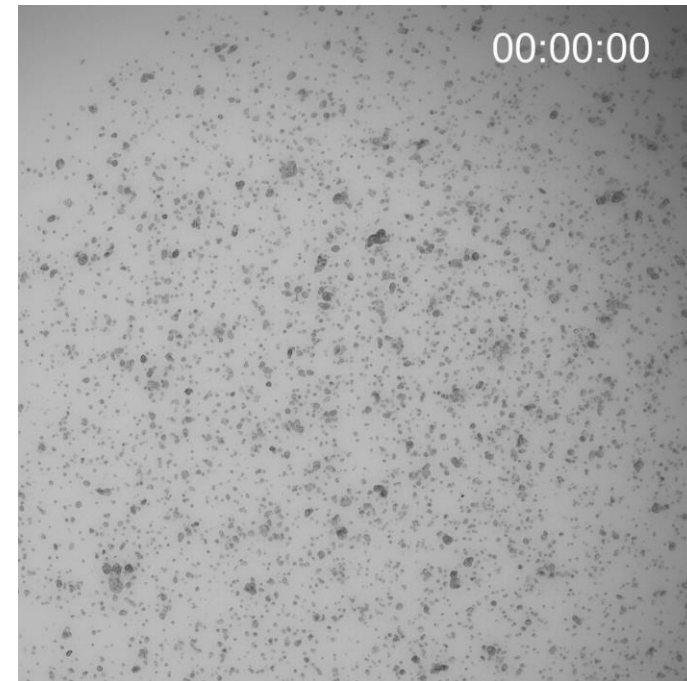
Live cell culture module

Controlled temperature, humidity and CO2:

- Temperature range: 5 - 40°C (0.1°C accuracy)
- Humidity < 80%
- CO2 concentration: 5.0 - 20.0% (0.1°C accuracy)



120 h monitoring - 1 h interval



Gastric cancer organoids

4x

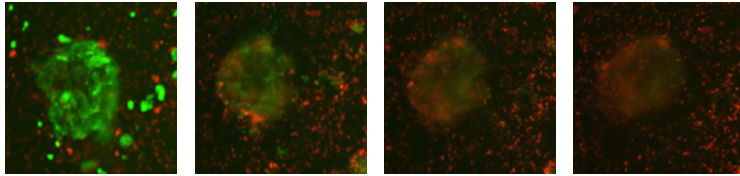
24-well plate

G-Cell Enables Live-Cell Monitoring

Continuous culture and long-term observation of live cells

Continuous image acquisition of samples at fixed time intervals and video synthesis

Co-culture of immune cells with tumor organoids



Objective magnification: 4x

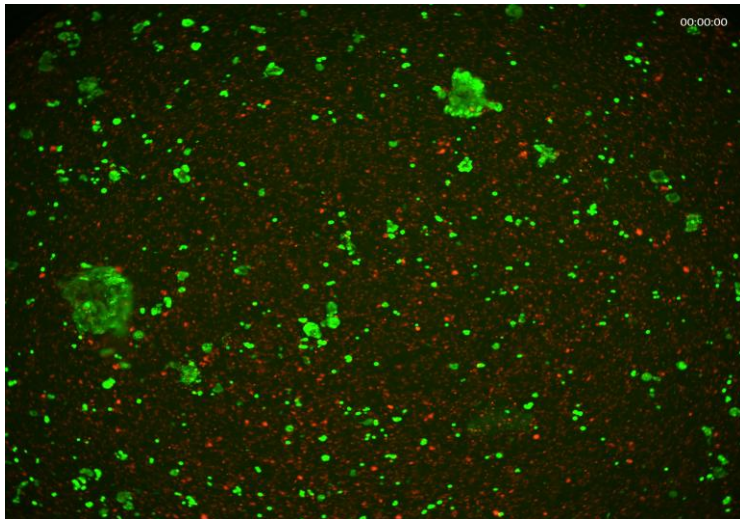


Plate type: Nest 96-well

Collection channels:
Fluorescence 488/561
channels

Collection interval: 30 min

Total culture duration: 88 h

96-hour culture of gastric cancer organoids



Objective magnification: 4x

Acquisition channel:
Bright field

Collection method: Z-axis
layer sweep + time series

Layer sweep range:
3000 - 5000 μm

Total culture duration: 1 h

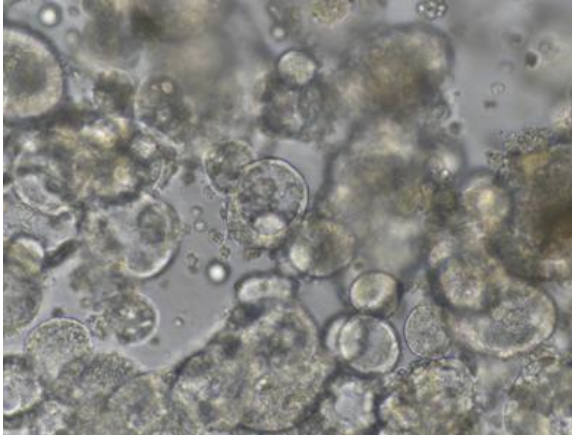
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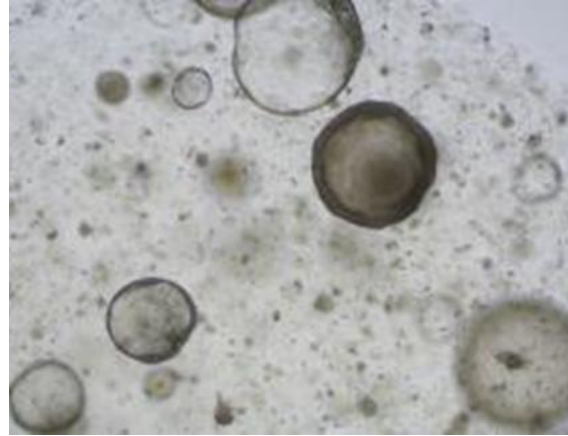
4. VALIDATION STUDIES

System Validated for 15+ Sample Types

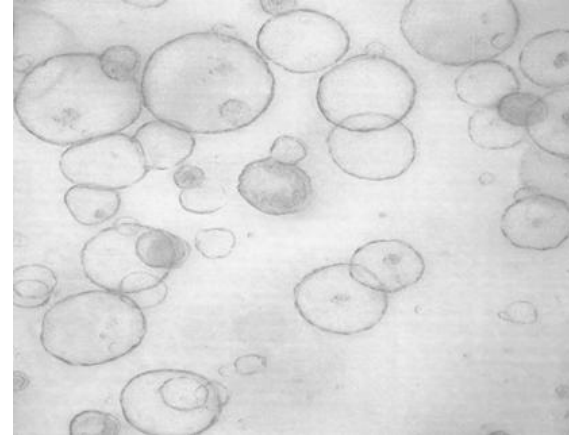
Colon cancer PDOs



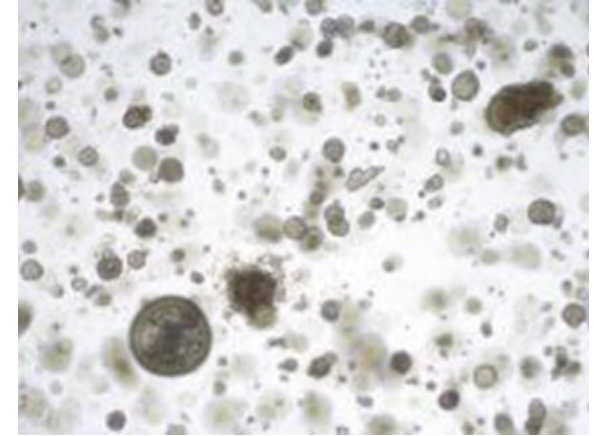
Esophageal cancer PDOs



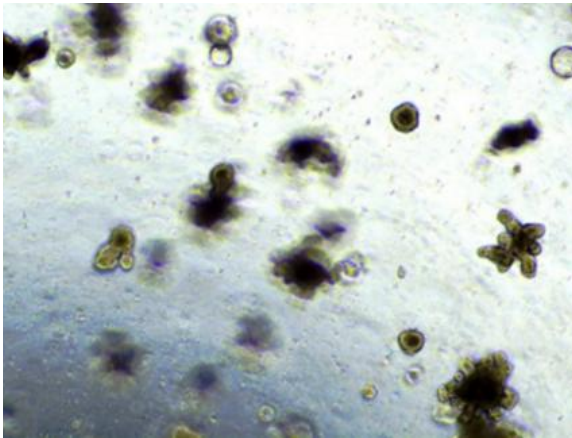
Gastric cancer PDOs



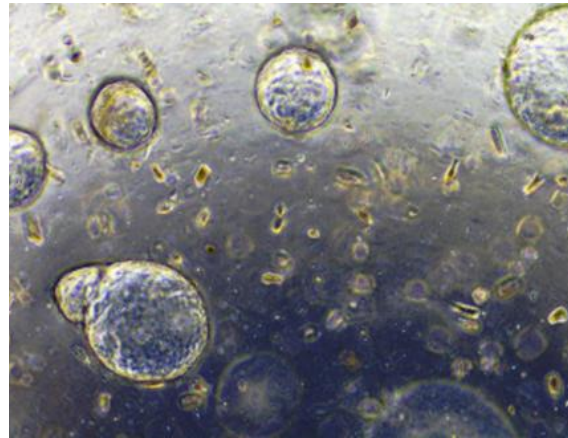
Esophageal organoids



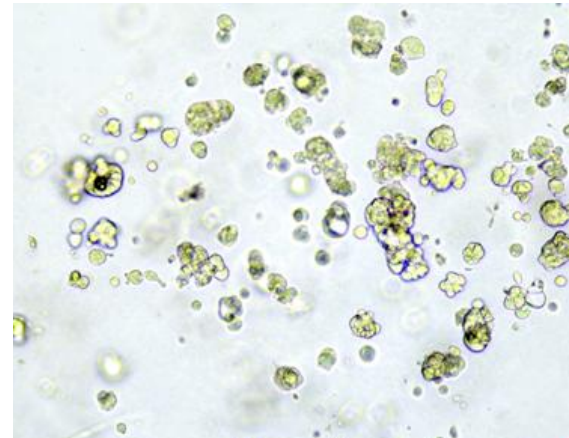
Mouse intestinal organoids



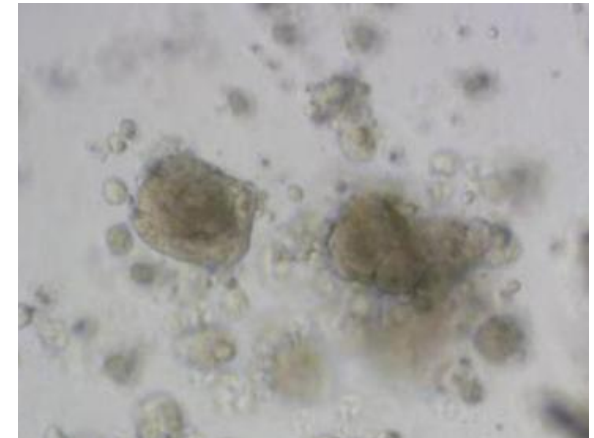
Mouse liver organoids



Ovarian cancer

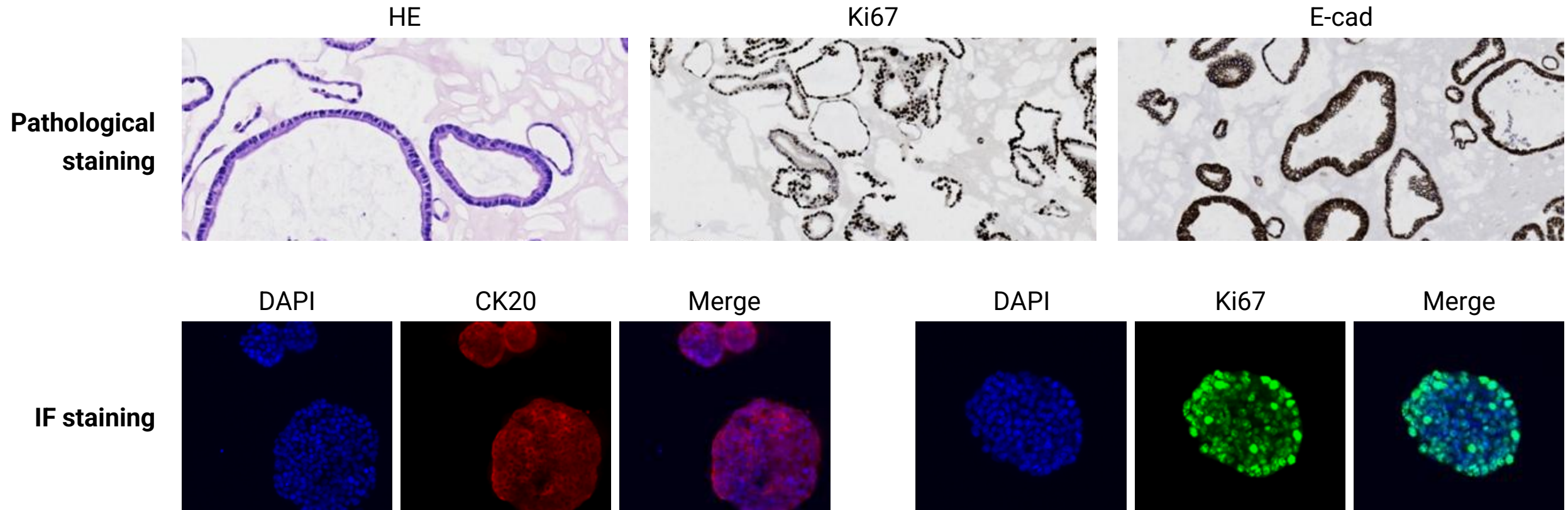


Breast cancer



Characterization of Gastric Organoids

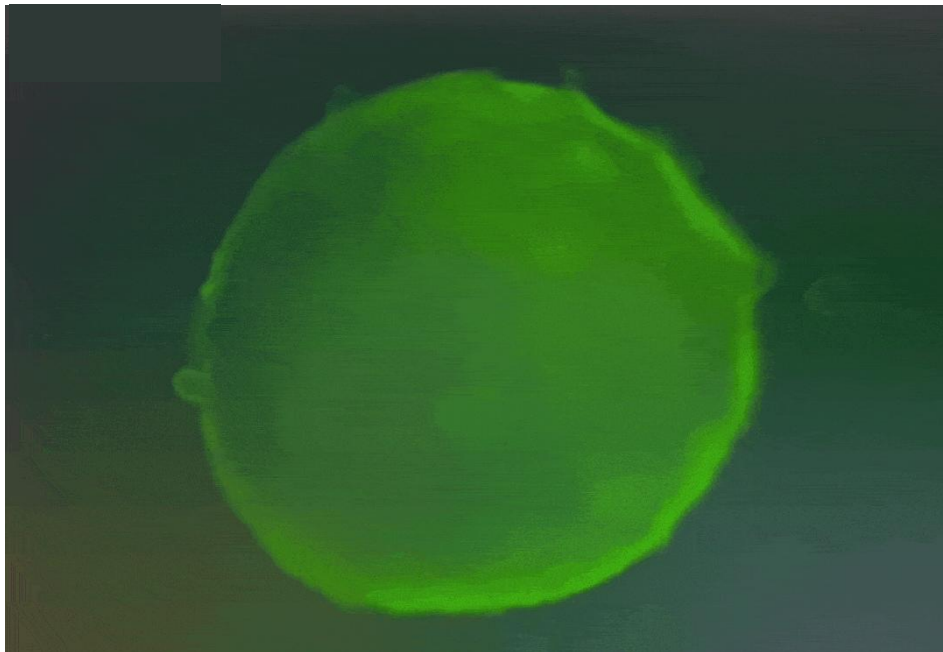
Histological (H&E) and immunofluorescence analyses demonstrated that gastric organoids generated using the Galatek gastric organoid kit recapitulate key functional properties of gastric tissue in vivo.



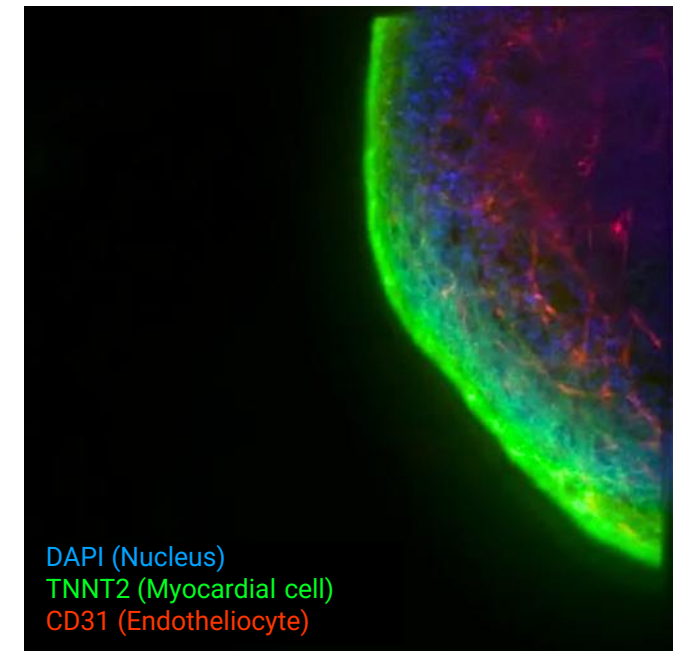
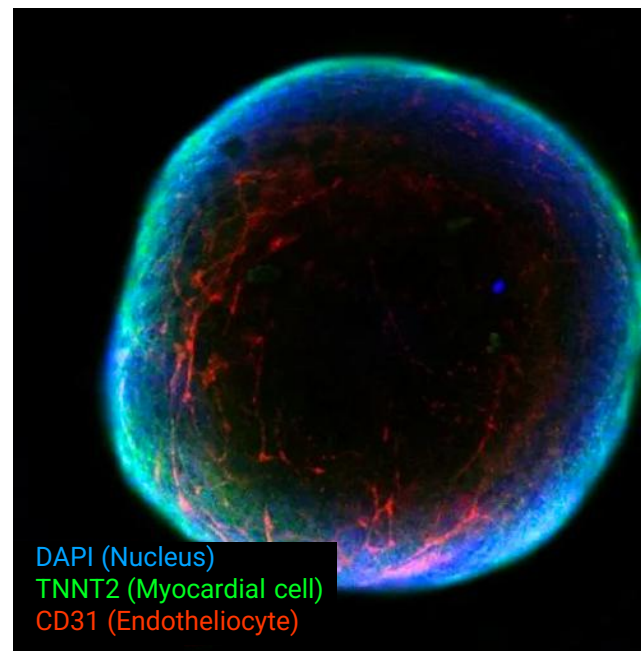
Characterization of Cardiac Organoids

Results demonstrated that cardiac organoids generated using the Galatek cardiac organoid kit recapitulate key functional properties of cardiac tissue in vivo.

Calcium ion current changes

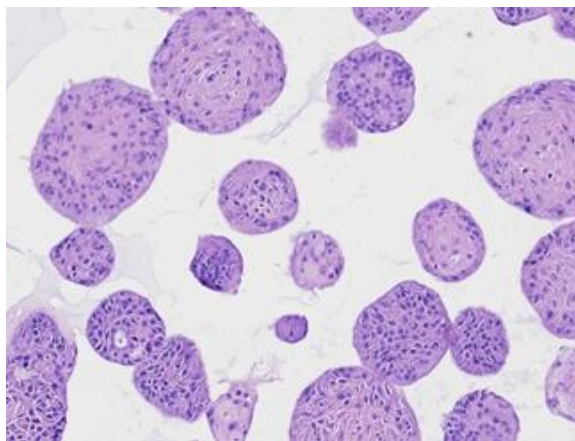


Identification of cardiac organoids by integral staining

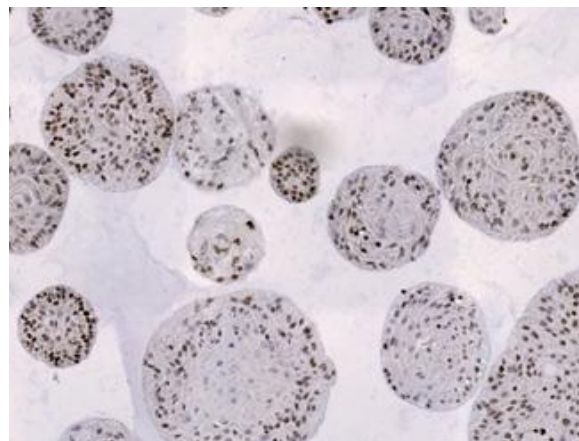


Characterization of Lung Adenocarcinoma Organoids

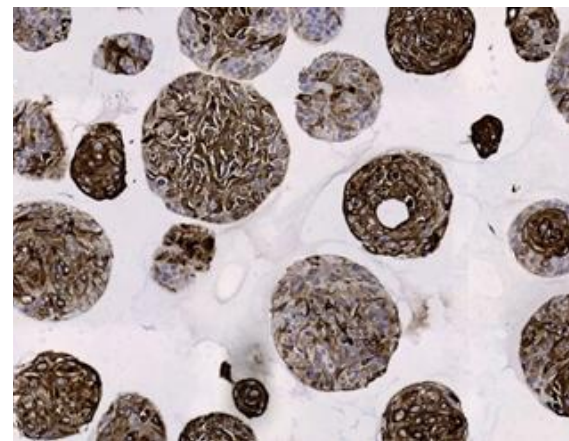
HE



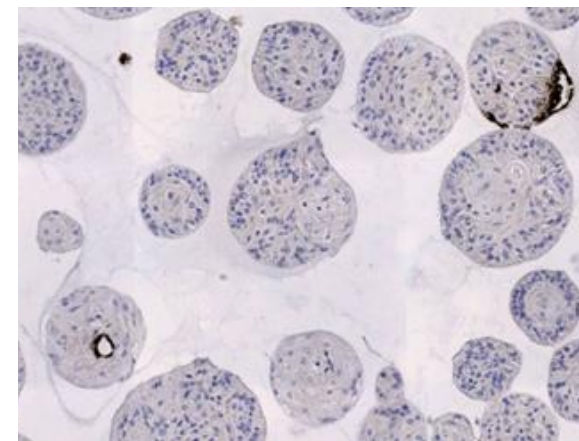
TTF-1



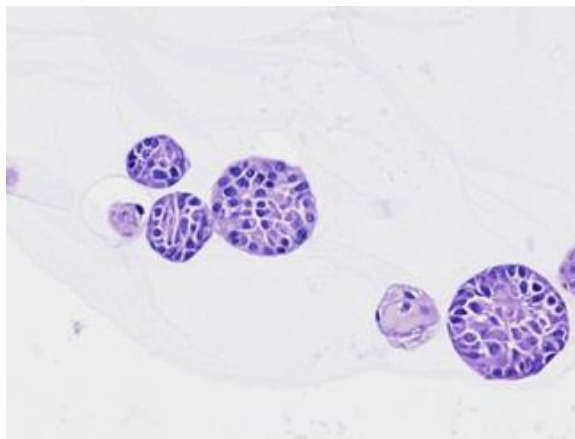
CK7



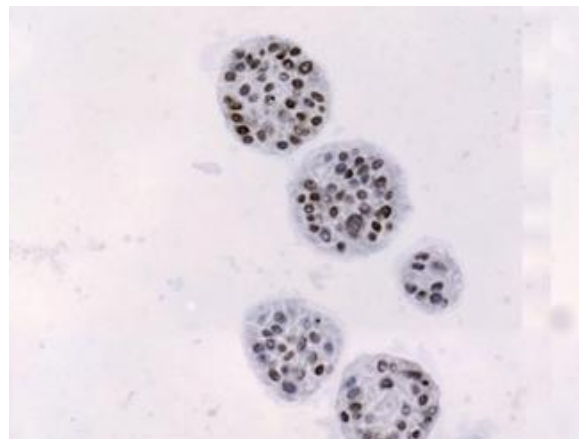
Napasin A



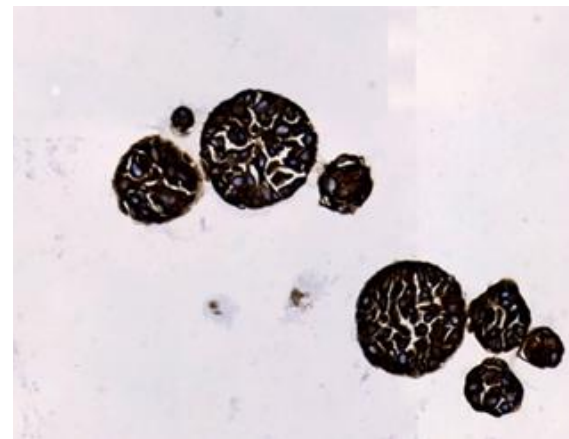
HE



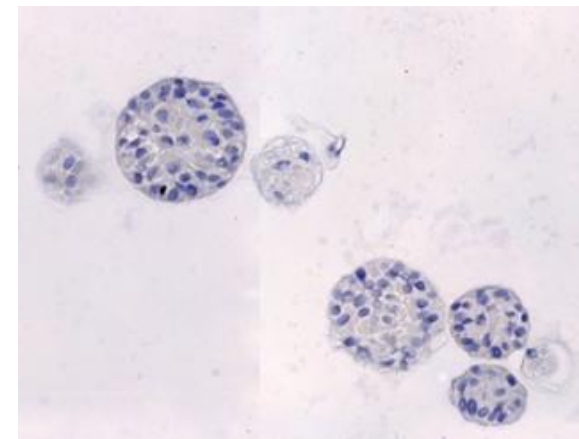
TTF-1



CK7



Napasin A



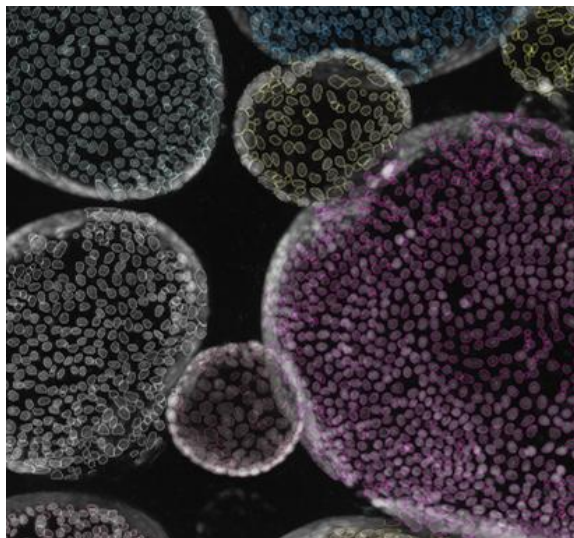
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5. IMAGE ANALYSIS

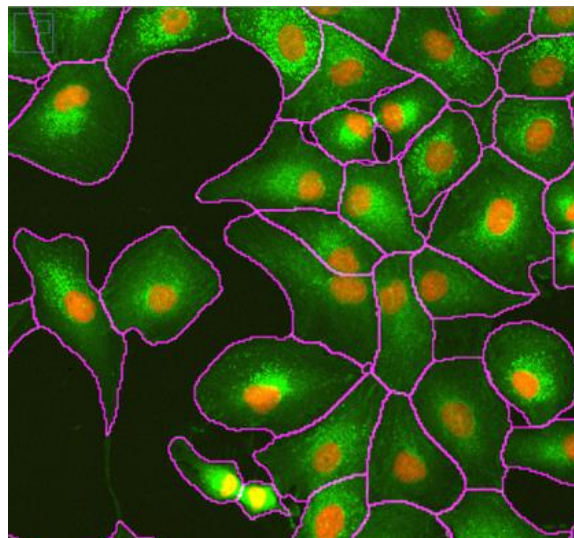
G-Cell Supports Powerful Image Analysis

Nuclear recognition



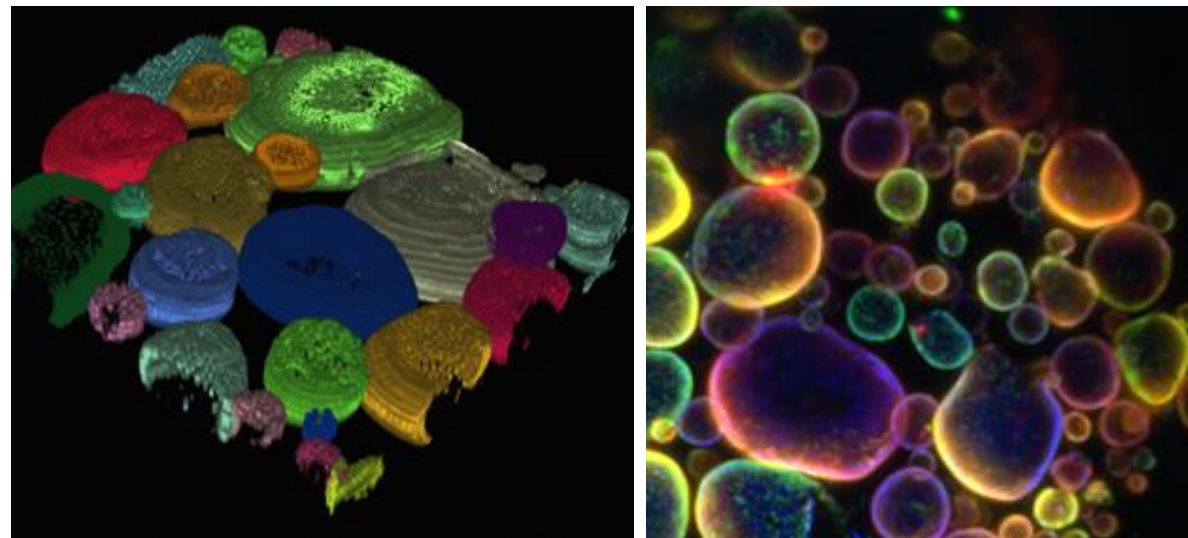
Organoid nuclear recognition

Cell segmentation



Cell recognition

3D reconstruction

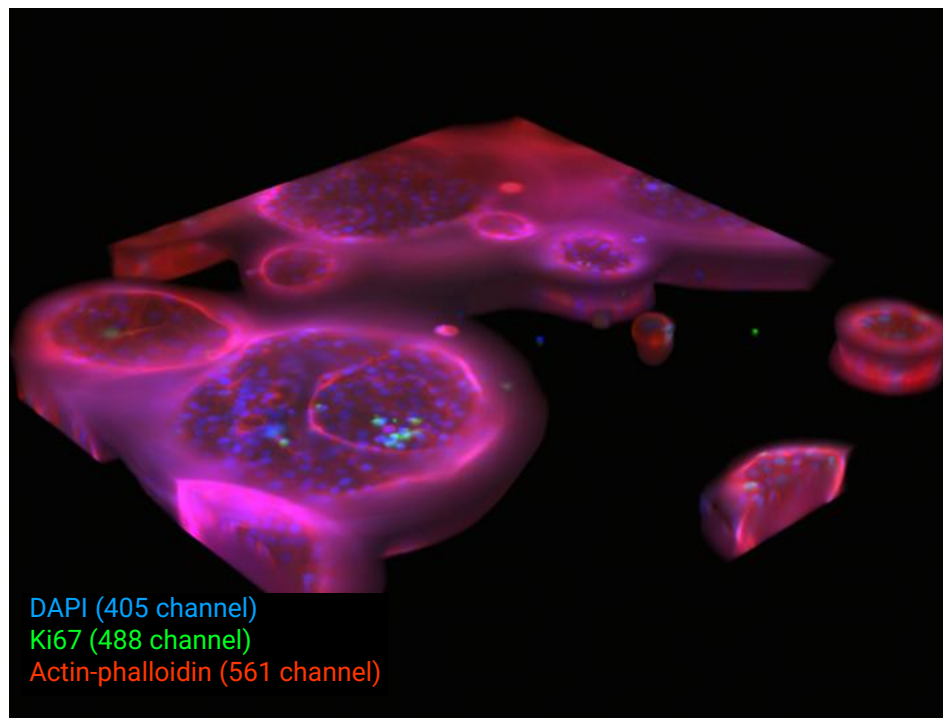


Liver organoids, 20x

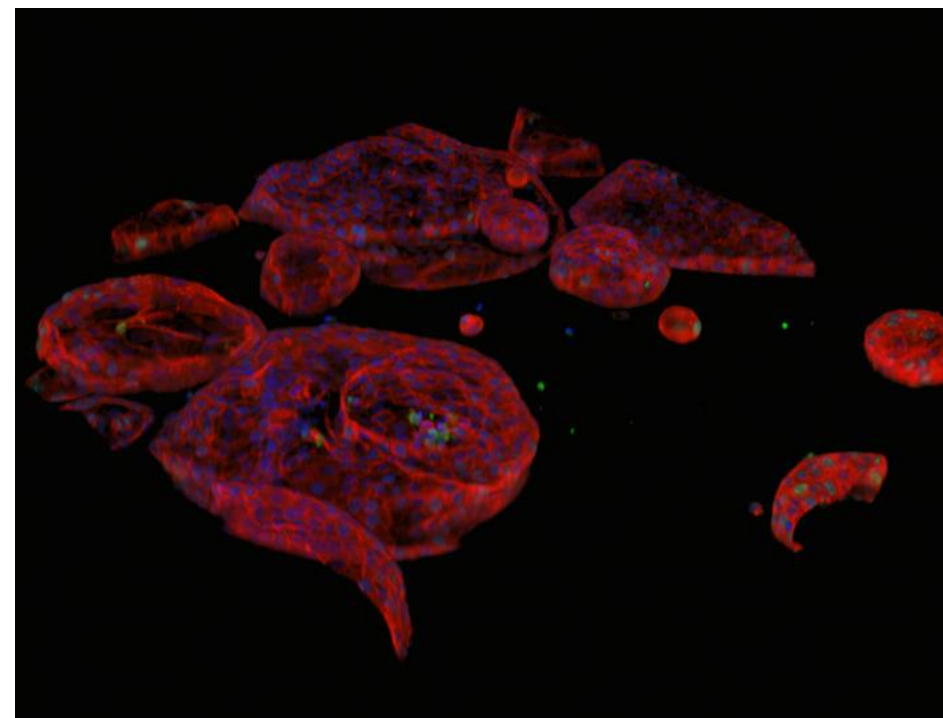
G-Cell Supports Powerful Image Analysis

Currently expanding applications from 2D to 3D

GCO organoid samples:



Wide-field 3D reconstruction



Confocal 3D reconstruction

G-Cell Supports Powerful Image Analysis

60+ Image Processing & Analysis Modules

Access over 60 **continuously expanding modules**, covering image processing and comprehensive feature quantitative measurement, including morphology, intensity, and texture.

The goal? Convert complex images into structured, traceable, and quantifiable data.

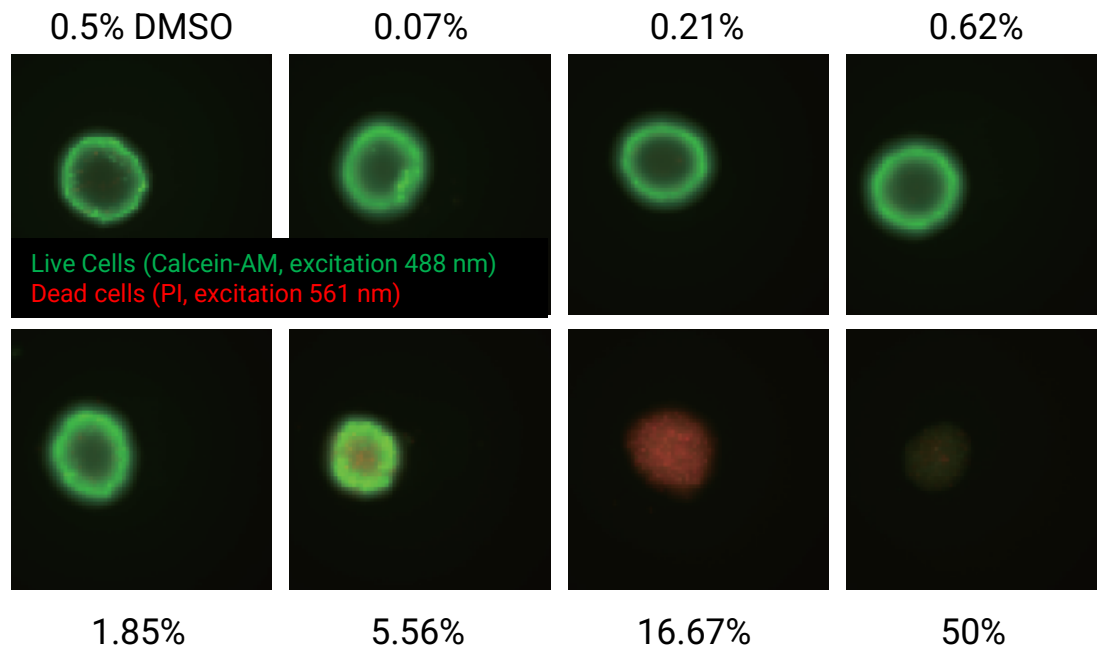
Advanced AI Image Recognition & Custom AI Model Training

Leverage **AI-powered image recognition** to improve the accuracy and robustness of object detection and segmentation.

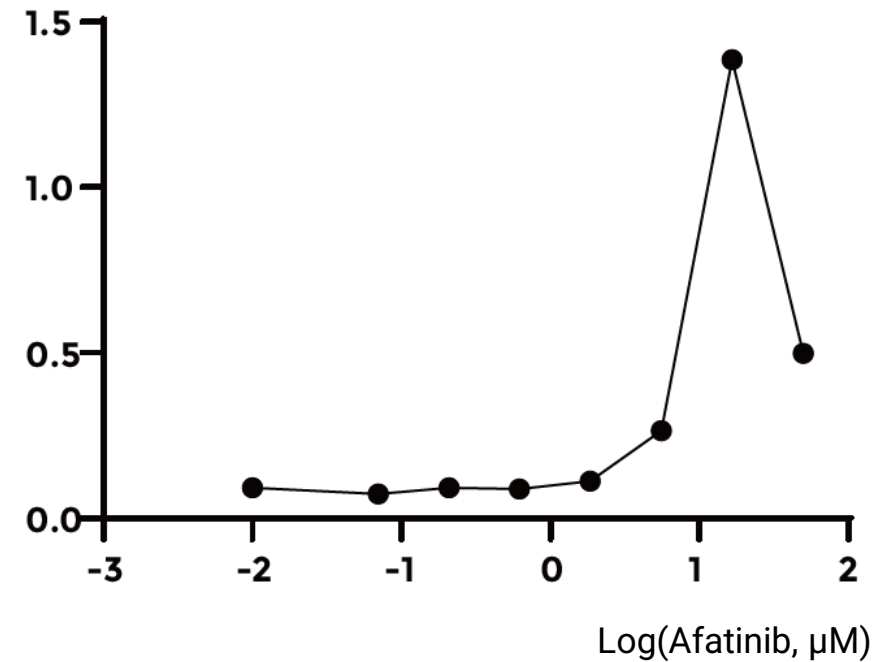
You can also **train AI models tailored to specific sample types and research applications**. Enable intelligent, efficient, and highly accurate image recognition and extraction optimized for your unique experimental workflows.

G-Cell Supports Drug Screening

Drug toxicity test on 3D cell spheroids



RMFI PI/Calcein-AM



Take-Home Messages



Increase imaging reliability, reproducibility and throughput

Standardize acquisition across experiments, reducing variability while enabling larger numbers of samples and conditions to be processed efficiently.



Automate imaging decisions across complex samples

Imaging parameters can be defined once and systematically **applied across samples**.



Enable automated live-cell and time-lapse monitoring

Automated acquisition enables **experiments to run over extended periods**, including overnight or over weekends.



Maintain traceability by connecting images to experimental metadata

Images can be automatically **associated with relevant experimental information** making datasets easier to organize, track and reproduce.



Integrate imaging into automated workflows for data-driven decisions

Image acquisition and analysis can become part of an integrated culture and drug screening workflow, where **image-derived information can support experimental decision-making**.

**Thank you
for your attention.**

CONTACT US!

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email address

www.galatek.ai

website

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