

# Automated Solutions for Organoid Culture and Drug Screening

AI & Data-Driven Advanced  
Productivity Tools

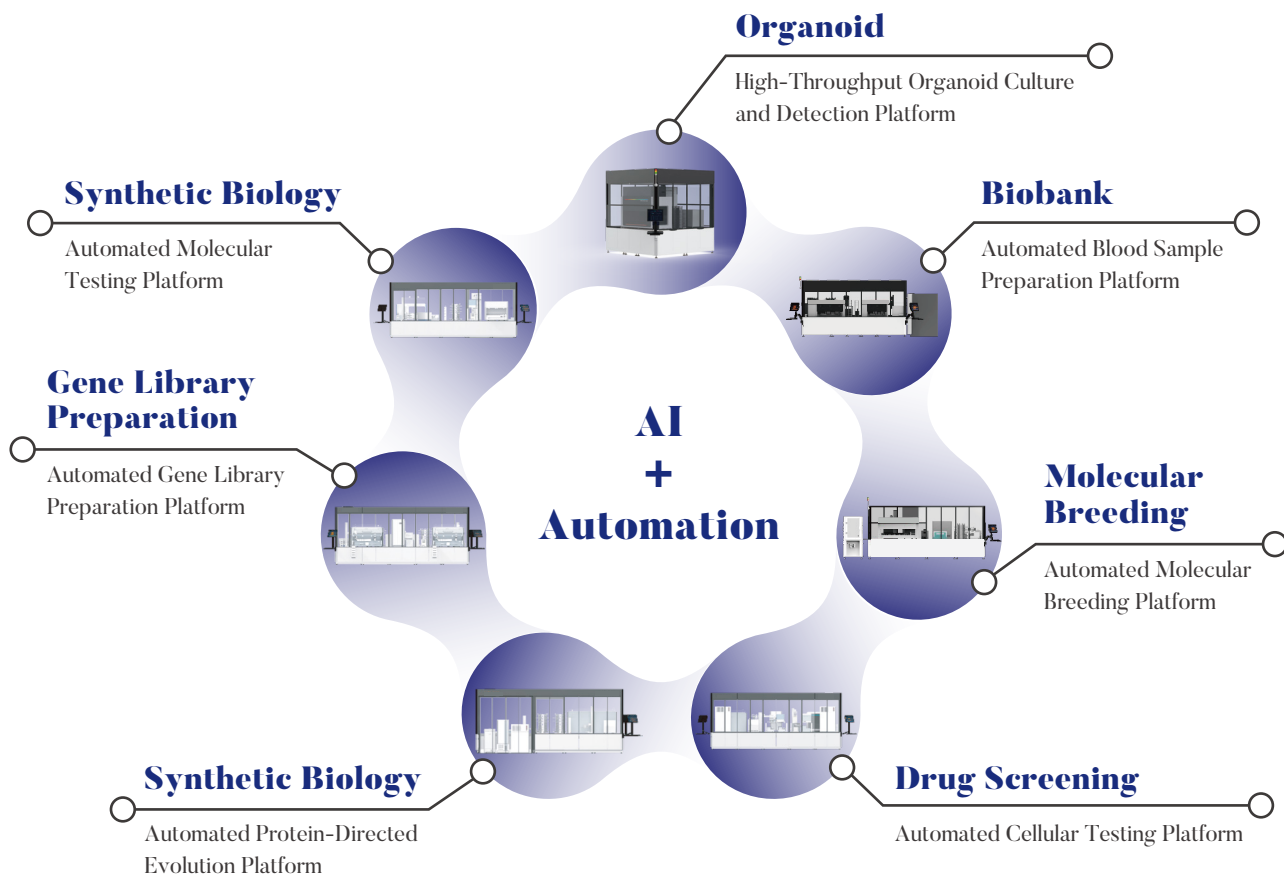
High-  
Quality  
Data

AI-Assisted  
Design

Multi-  
functional  
Platform

# AI for Life Science - Building a Data Factory for Life Sciences

Empowering the life science field through AI technology can accelerate scientific innovation and industrial breakthroughs. In this progress, high-quality data factories play a crucial role as the core foundation for generating the data needed for AI. It provides a precise and reliable data base for scientific research and promotes the reshaping of the new paradigm of research.



# Organoid Industry Overview

Organoid industry is based on 3D in vitro culture technology, using stem cells and patient cells to develop miniature functionalized organoid models, which precisely simulate the physiological and pathological characteristics of human organs, and are widely used in drug screening, disease mechanism research and personalized medicine. Its core value lies in replacing traditional animal models, improving the efficiency of drug development and reducing the clinical failure rate. The global market is growing at a rapid pace and capital is accelerating, driving the iteration of automated culture, high-throughput testing and other technologies. In the future, the integration of organoids with gene editing, AI analysis and other technologies is expected to revolutionize the paradigm of biomedical R&D, shorten the development cycle of new drugs, and help the implementation of precision medicine.

## Application Directions



**Precision  
Medicine**



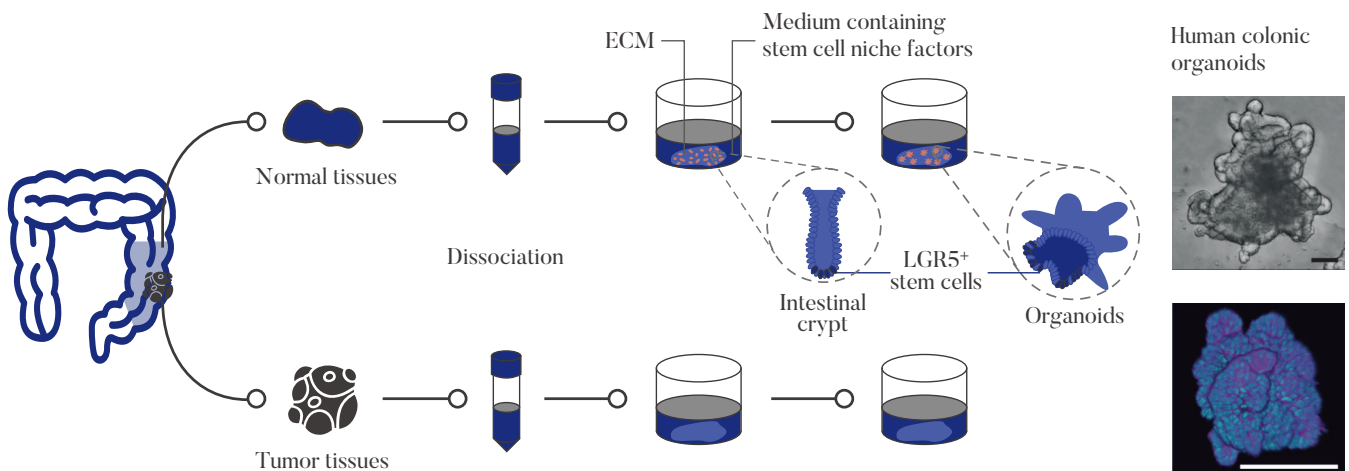
**Regeneration  
Medicine**



**Developmental Biology  
and Disease Modeling**



**Drug Screening  
and Development**



## Challenges in Manual Culturing of Organoids

### Poor Reproducibility

Manual culture processes result in large batch-to-batch differences, difficult to meet FDA requirements for reproducibility

### Efficiency Bottlenecks

The lack of automated platforms for culture-to-analysis and the fact that high-content imaging and AI data analysis are not yet widely available have led to weeks-long cycles for individual drug screening

### Isolated Data Islands

The fragmentation of data from all aspects of organoid culture, imaging, and analysis prevents the formation of a complete chain of evidence that meets regulatory requirements

### Reliance on Subjective Assessment

Reliance on visual observation, lack of precise quantitative indicators and objectivity in analysis

# Automation + High-Quality Data + AI-Powered Organoid Culture

The digital intelligence organoid solution can optimize the organoid culture process using intelligent formula design, automated culture validation, and multimodal system evaluation. First, AI is used to extract literature data and recommend recipes, followed by culture and image acquisition in the automated platform. Through image recognition and multi-dimensional data analysis (e.g., protein, pathology, etc.), the system continuously optimizes the culture protocol. Combined with machine learning, it provides personalized solutions for different cancer types and experiments. Supported by an automated platform to provide precise as well as efficient experimental pathways, the digital intelligence solution can maximize the experimental efficiency and culture success rate of organoid culture.

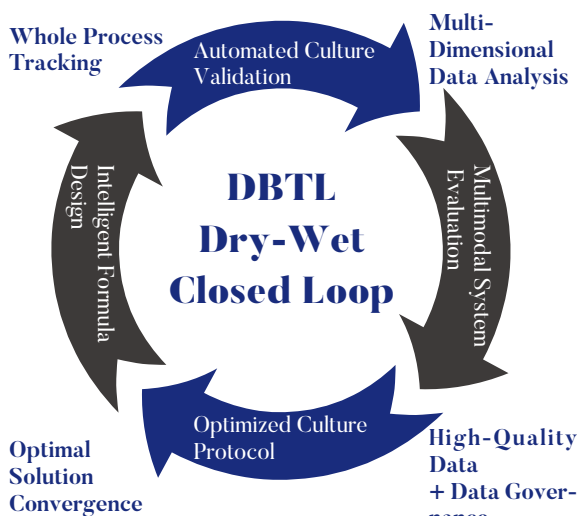
## Automated Organoid Culture

Automated organoid culture based on the formula design

**Information Extraction:** Using AI to capture protocols and culture results from over 10,000 organoid-related literature and documents

**Intelligent Analysis:** Structuring and scoring to generate recommended formula

**Machine Learning:** Utilizing the organoid culture and evaluation data accumulated from different cancer types and patients in the data factory, to perform machine learning techniques such as few-shot learning and transfer learning



## Timed Collection of Image Data During Culture

Statistics on parameters such as diameter, quantity, and average surface area of organoids for process decision making

**Image Identification:** AI empowers the identification of organoid images, including localization, growth indicators, and morphological classification

**Multi-Dimensional Evaluation:** Using protein, pathology, multi-omics data, and other analyses to intelligently optimize the evaluation system

**Personalized Solutions:** Adjust the experimental design (e.g., staging, processing duration, concentration, etc.) based on the specific organoid requirements to provide personalized solutions

## Advantages of Digital Intelligence Organoid Culture



### AI-Driven Insights Inform Decisions

AI-driven data analysis and decision-making for whole-process tracking of organoid culture status



### Reduces the Difficulty of Organoid Culture

Automated standard culture method highly ensures the culture efficiency and success rate



### Automated Standard Culture

Reproducible standard culture method and QC system enable high-throughput and low-error culture

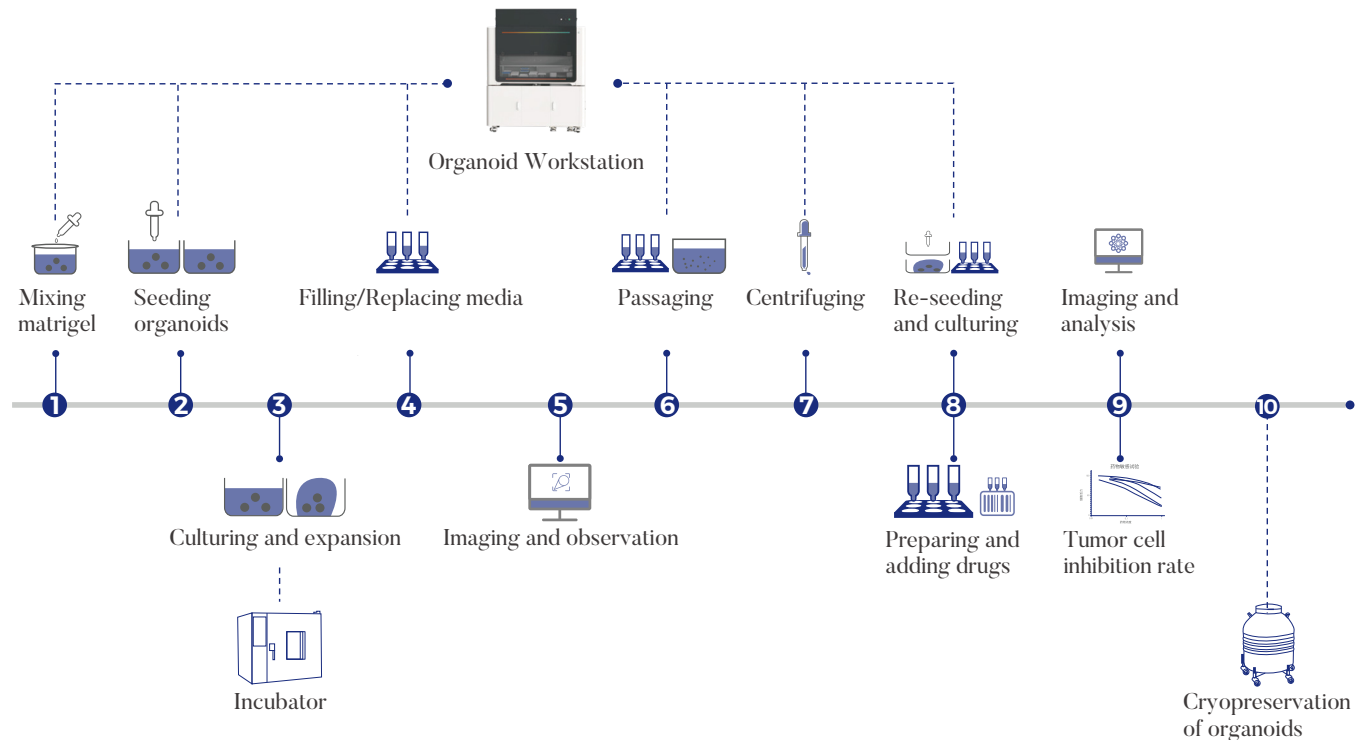


### Integrated Business Solution

Supporting media, matrigel, and auxiliary reagents to control the material source standardization from the source

# AI + Automation Empowerment, Making the Organoid Culture Easy for Everyone

Relying on years of integrated development and delivery capabilities in intelligent manufacturing, along with extensive experience in automated laboratory integration, we have innovated to develop an automated organoid culture and high-throughput drug screening solution, which covers the whole process of organoid primary construction, passaging, cryopreservation, resuscitation, drug screening, and intelligent data management. Beyond operational standardization, it automates and integrates modular experimental processes to meet the demands of organoid research for high quality, high throughput, high efficiency, high safety, high precision, and high compliance.



## Solution Advantages



### Improves Organoid Culture Success Rate

Built-in standard operating protocols to improve organoid culture success rate and consistency



### Enhances the Efficiency of Organoid Culture

Automates the complex process of organoid culture to improve experimental efficiency



### Compatible with Various Organoid Models

Supports the culture of various adult stem cell-derived organoids and iPSC-derived organoids culture, with broad applicability



### Experimental Data Traceability

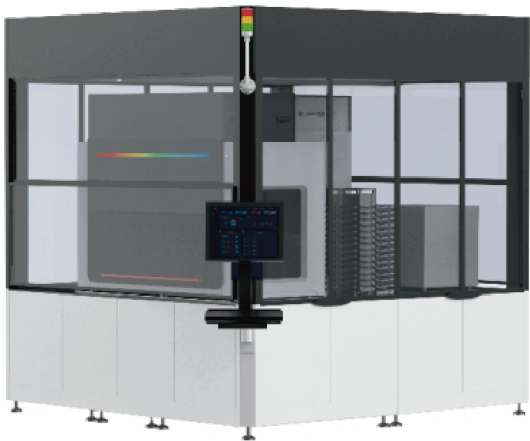
Whole-process data tracking to improve data traceability and reusability



### No Need for Separate Consumable Matching

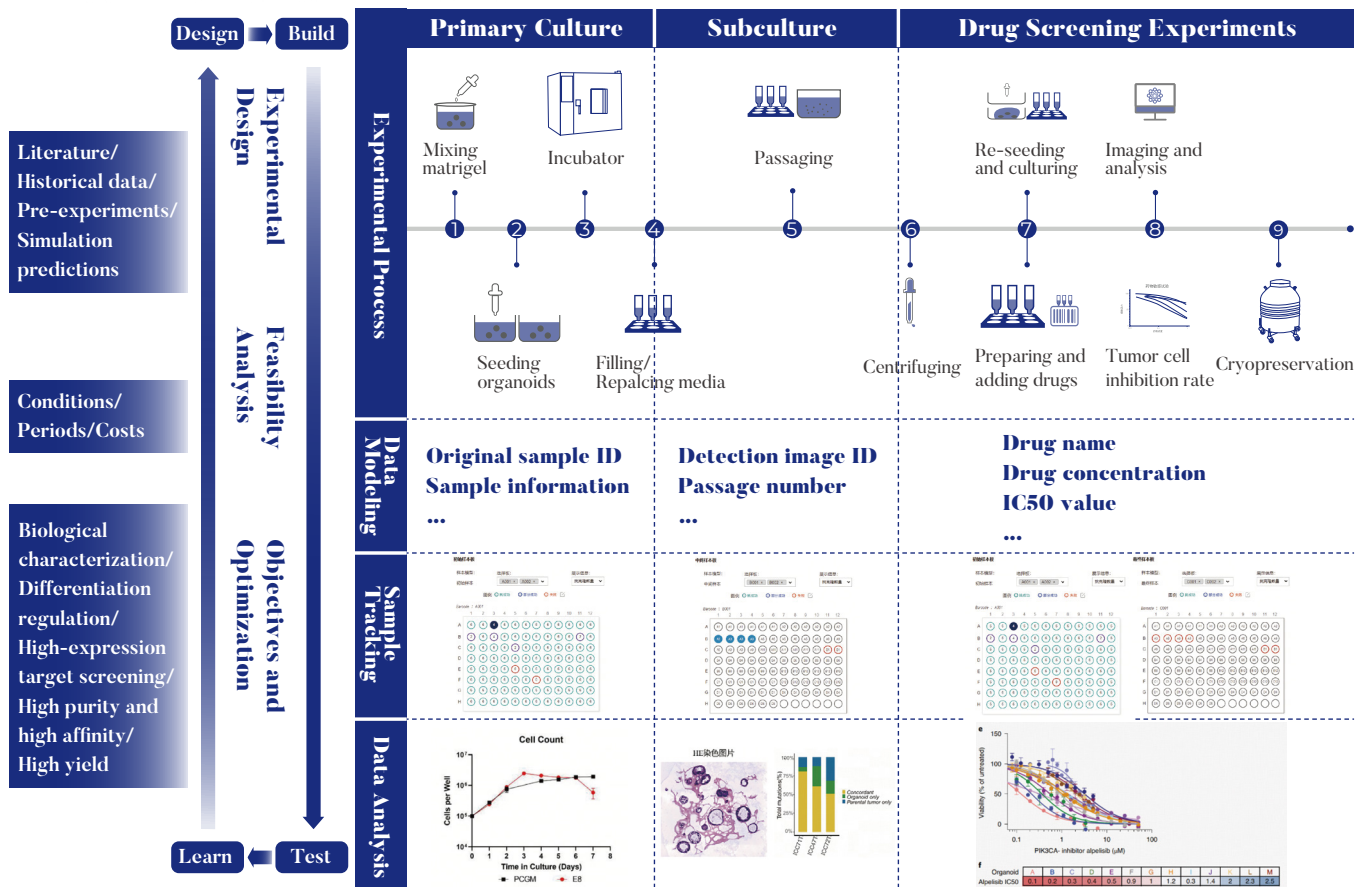
Various organoid media, matrigels and auxiliary reagents are available

# High-Throughput Organoid Culture and Detection Platform



The High-Throughput Organoid Culture and Detection Platform is an integrated intelligent system that supports the whole-process automation of organoid preparation, detection and drug sensitivity testing. The system features whole-process data tracking function, enabling automatic matching of test results with sample information, and significantly shortens the experimental cycle through fast multi-drug gradient configuration technology. The system supports the whole process of organoid seeding, online culture, centrifugation and media replacement, drug dilution, drug sensitivity analysis, balancing high-throughput operation with high-precision control to provide an efficient, reliable and integrated solution for drug screening and disease modeling research.

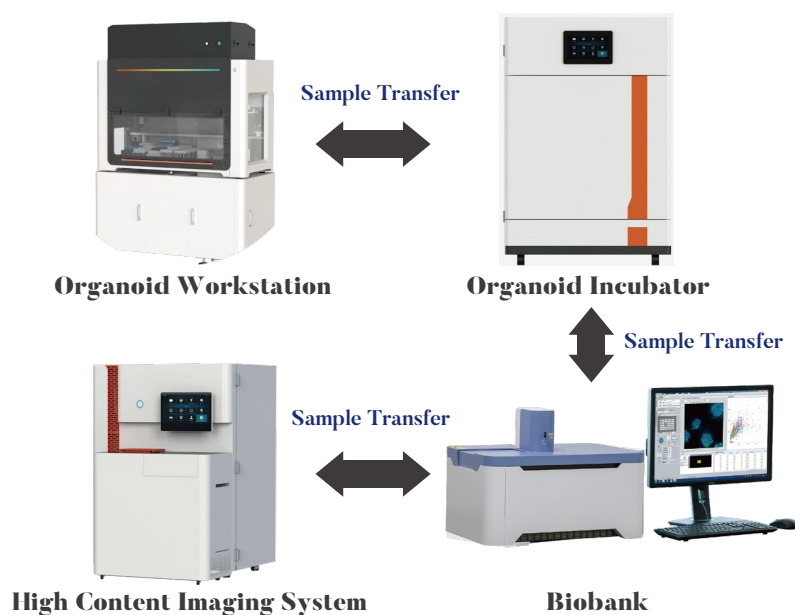
## Application Case: Organoid Drug Screening



## DBTL Dry-Wet Closed Loop



# G-Entry Automated Organoid Culture and Detection Platform



The Automated Organoid Culture and Detection Platform enables the automation of single processes such as organoid primary construction, passaging, and drug screening, with manual integration of the various devices. It is suitable for medium-throughput automated organoid preparation, detection, drug sensitivity testing/drug screening.

- **Medium-Throughput Efficiency:** Up to 4 tissue samples can be processed per batch, with a maximum of 12 samples per day, generating over 4,600 drug screening data points daily using 96-well plates, meeting medium-throughput requirements
- **Intelligent Data Chain:** Automatically identifies and tracks process data, precisely matches drug sensitivity results with samples, and ensures error-free and traceable data
- **Single-Process Automation:** Enables single-process automation for organoid primary construction, passaging, and drug screening, with easy manual integration, reducing operational complexity
- **Small-Scale Adaptation:** Focuses on entry-level automation and informatization, suitable for entry-stage research or small- to medium-scale organoid culture, drug sensitivity and drug screening scenarios

## Organoid Workstation



- **Configuration:** Flexible 8-channel + 4-channel + cooling module + temperature control module + tilt carrier + centrifuge + scanning module
- **Functions:** Matrigel mixing, organoid seeding, media filling/replacement, organoid passaging, centrifugation, drug preparation and addition

## Organoid Incubator



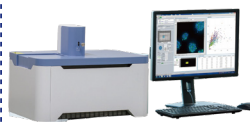
- **Configuration:** Temperature range from room temperature to 50 C, capable of placing 220 cell culture plates, with CO2 concentration from 0 to 20%
- **Functions:** Online organoid culture expansion, drug-treated post-culture

## Biobank



- **Configuration:** Temperature range from -50 C to -80 C, storage capacity of 100,000+ 0.75 mL cryotubes, with optional cryotube sizes
- **Functions:** Cryopreservation of organoid samples, supports whole box/single tube access, and can be docked with the sample information management system

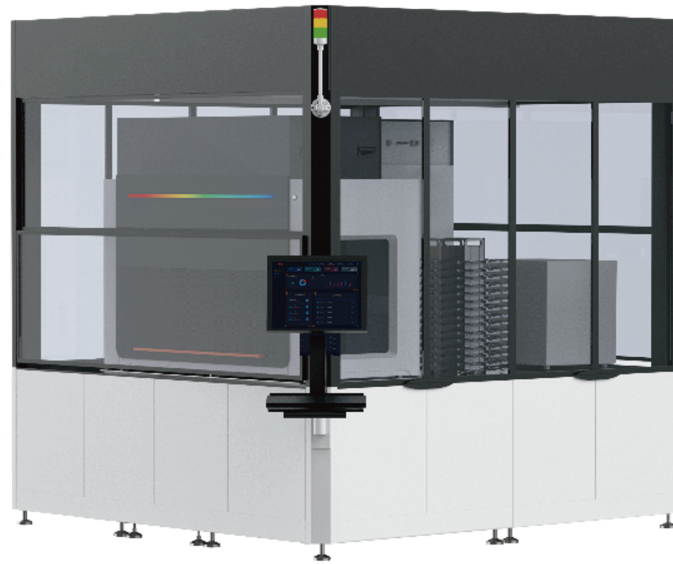
## High Content Imaging System



- **Configuration:** Micro-lens dual-disk confocal, low phototoxicity, flow cytometry analysis
- **Function:** Automated organoid imaging analysis with visualized data output

# G-Expertify Automated Organoid Culture and Detection Platform

The Automated Organoid Culture and Detection Platform (Professional-Level) enables the whole-process automation of organoid primary construction, passaging, and drug screening through robotic arm integration of all devices; it is used for the medium-throughput automated organoid preparation, detection, and drug sensitivity testing/drug screening.



1 Organoid workstation

3 High content imaging system

5 Consumable stack

2 Organoid incubator

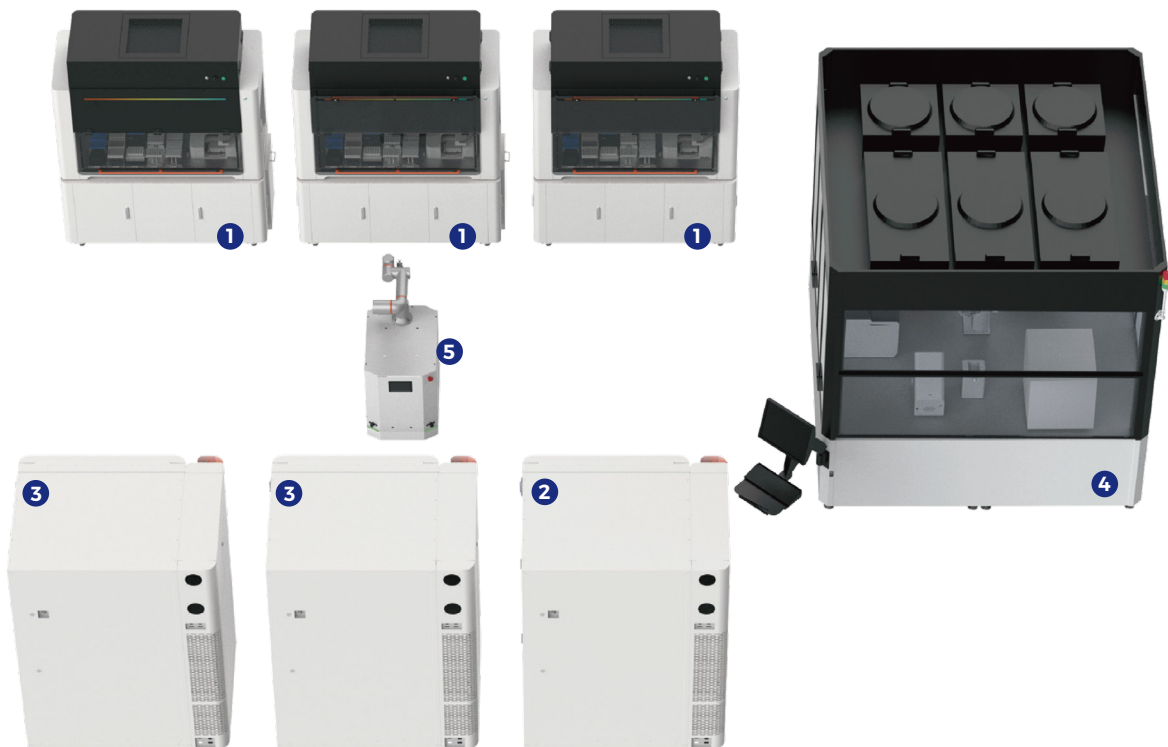
4 Multifunctional microplate reader

6 Sample transferring robotic arm

- **Intelligent Medium-Throughput:** Up to 4 tissue samples can be processed per batch, with a maximum of 12 samples per day, generating over 4,600 drug screening data points daily using 96-well plates, excellent in both efficiency and precision
- **AI Data Hub:** Equipped with AI-driven information management system, automatically matches data with samples in the whole process, forming a traceable digital testing archive
- **Whole-Process Automation:** The robotic arm intelligently integrates the devices to automate the whole process of organoid primary construction, passaging, and drug screening, reducing manual intervention
- **Expert Wisdom:** Equipped with high automation and informatization, it is suitable for medium-scale organoid preparation and drug sensitivity testing & drug screening needs in specialized scenarios such as research institutes and hospitals

# G-Proficient High-Throughput Organoid Culture and Detection Platform

The High-Throughput Organoid Culture and Detection Platform (Expert-Level) enables the whole-process automation of organoid primary construction, passaging, drug screening and organoid storage through robotic arm integration of all devices; it is used for the high-throughput automated organoid preparation, detection, and drug sensitivity testing/drug screening.



- ① Organoid workstation (with consumable stacks)
- ② Organoid incubator
- ③ Organoid biobank
- ④ Organoid detection, analysis and storage pre-processing system [including high content imaging instrument, microplate reader, cryotube decapping instrument and code scanner, nanoliter dispenser (optional)]
- ⑤ Sample transferring robot

- **Ultra-High-Throughput Processing:** Up to 12 tissue samples can be processed per batch, with a maximum of 36 samples per day, generating over 10,000 drug screening data per day using 96-well plates, increasing efficiency by more than 2 times
- **AI Full Control:** AI deeply engages in information recognition, data tracking, and result analysis, ensuring precise matching of drug sensitivity results with samples and full-process data traceability
- **Dark Lab Closed Loop:** The robot integrates all devices to enable end-to-end organoid primary construction, passaging, drug screening, and sample storage, supporting 24-hour unattended operation
- **Industrial-grade application:** With high levels of automation and informatization, it is suitable for high-throughput organoid development and large-scale drug screening in professional scenarios such as pharmaceutical companies and large laboratories

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## **Declaration**

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