

Galatek

Automation and AI-Driven Solutions for Organoid Research

Galatek Intelligent Automation Solutions



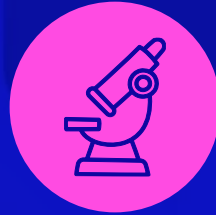
1000+

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

Automation and AI-Driven Solutions for Organoid Research

1. INTRODUCTION

Common Challenges in Organoid Research



Reproducibility & Batch Variability

Small differences in cell density, timing, and handling can lead to significant differences in organoid size, morphology, viability, and maturity. **Manual, operator-dependent QC further** makes it difficult to consistently determine which organoids are suitable for downstream use.



Protocol Complexity Limits Scale & Throughput

Organoid workflows often require **multiple sequential steps and precisely timed interventions**. Dependence on scientist availability can **constrain experiments** to working hours and introduce additional variability.



Sample Utilization Efficiency

Clinical and patient-derived specimens are often scarce, heterogeneous, and difficult to replace. Inefficient generation or low success rates can consume valuable starting material, limiting the number of experiments.



Data Integrity, Standardization & Compliance

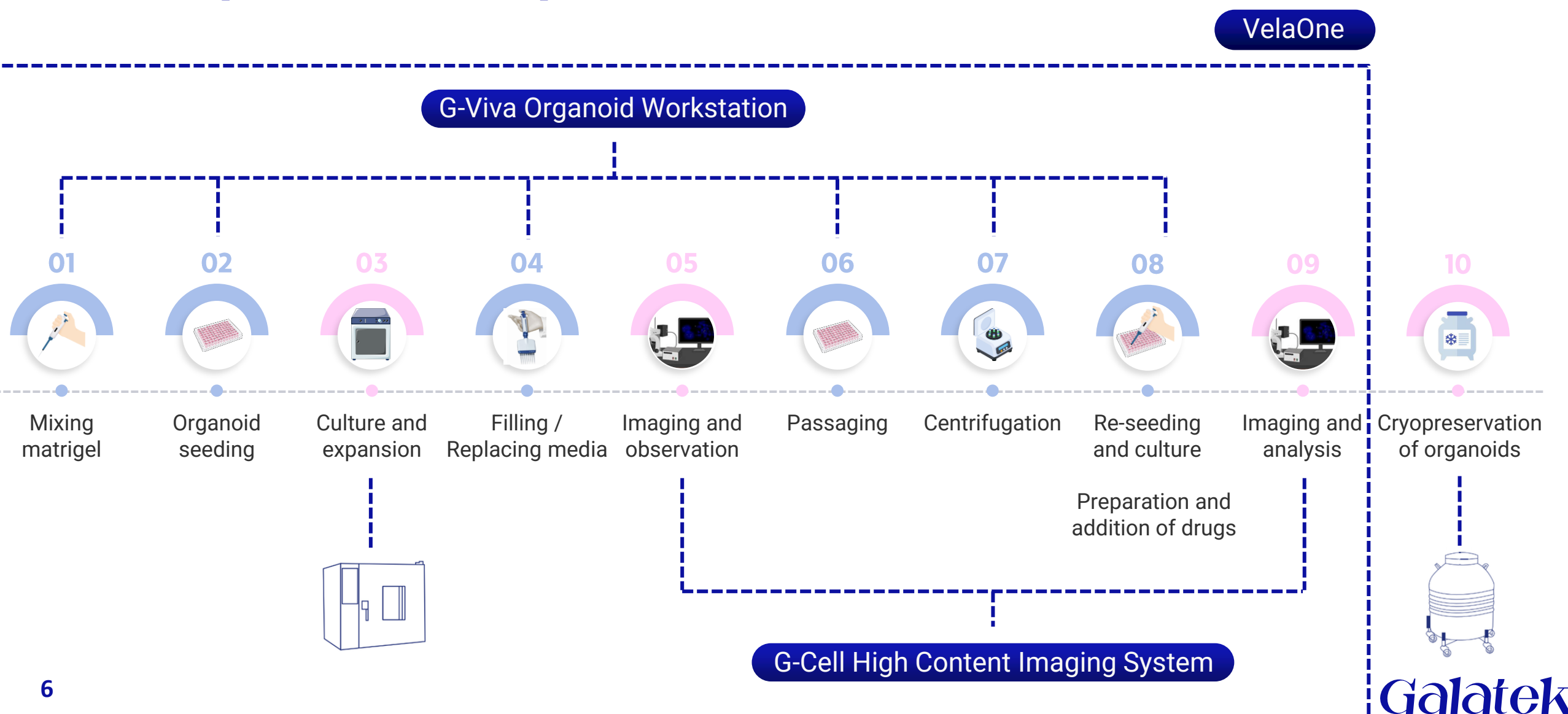
Manual data entry and fragmented records across notebooks, spreadsheets, and files can lead to missing, inconsistent, or difficult-to-trace experimental data. This creates challenges for reproducibility, **standardized analysis, auditability, and compliance**.



Automation Complexity & Integration

Translating biological protocols into machine-compatible workflows requires specialized automation knowledge. **Disconnected instruments, software, and data formats** further complicate workflow integration and end-to-end experiment traceability.

Organoid Culture & Drug Screening: A Complex Multistep Workflow



Organoid Culture & Drug Screening: Our Solutions at a Glance



G-Viva Organoid Workstation

Supports key steps of organoid culture and drug testing, such as seeding, media exchange, passaging, and drug addition.



G-Cell High Content Imaging System

For real-time tracking of organoid growth, morphology, and viability. Our software tools, with preconfigured and AI-based options, supports advanced image analysis.



Standardized Integration Platform for Organoids

Multiple instruments working together to minimize manual intervention across the entire workflow.

Automation and AI-Driven Solutions for Organoid Research

2. ORGANOID CULTURE PLATFORM

Our Organoid Culture Workstation

Cutting-edge technology

Independent 8 pipetting channels with adjustable tip spacing and flexible Z-axis
Robotic arm can access the whole deck, transferring plates between various positions

Automation integration

Possibility of **integrating with various devices** (high-content imagers, microplate readers, etc.) to enable full workflow automation

Easy-to-use software

Graphic interface with pre-defined workflows to simplify operation

Open platform

Flexible modular design — Easily integrate different modules to meet any protocol or application needs

Fully open software — Design and customize your protocols with complete freedom, so they fit your requirements perfectly

Universal compatibility — Works with reagents and consumables from different manufacturers

G-Viva Organoid Workstation



Functional Modules Available to Enable Different Protocol Requirements



**Cooling
Module**



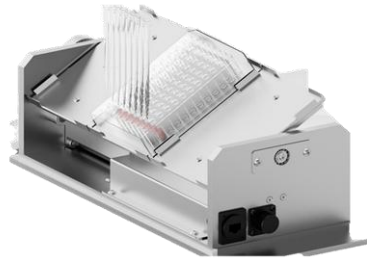
Maintain matrigel
in a liquid state



**Heating &
Shaking Module**



Incubate media at
37°C with constant
temperature



**Media Replacement
Module**



Replace media



Centrifuge



Separate cells, wash,
and sediment

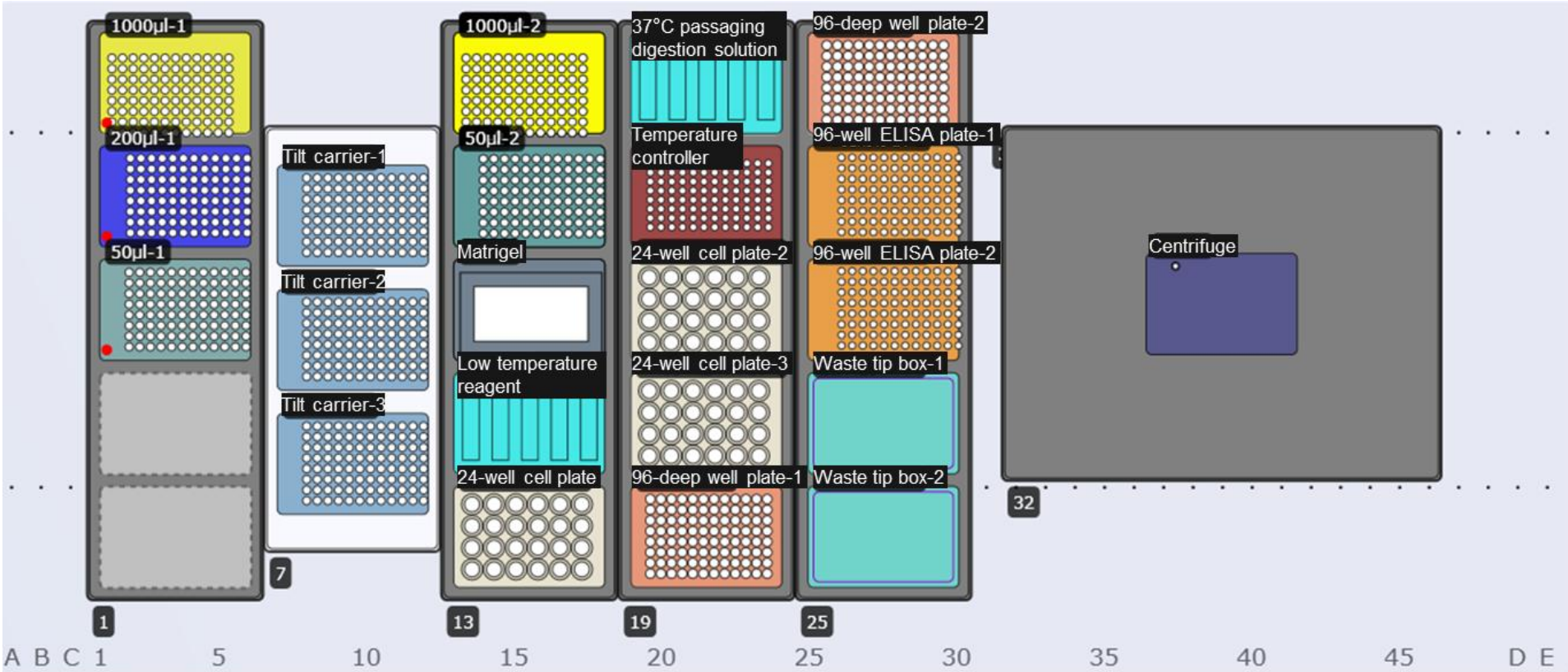


**HEPA Filtration & UV
Decontamination**



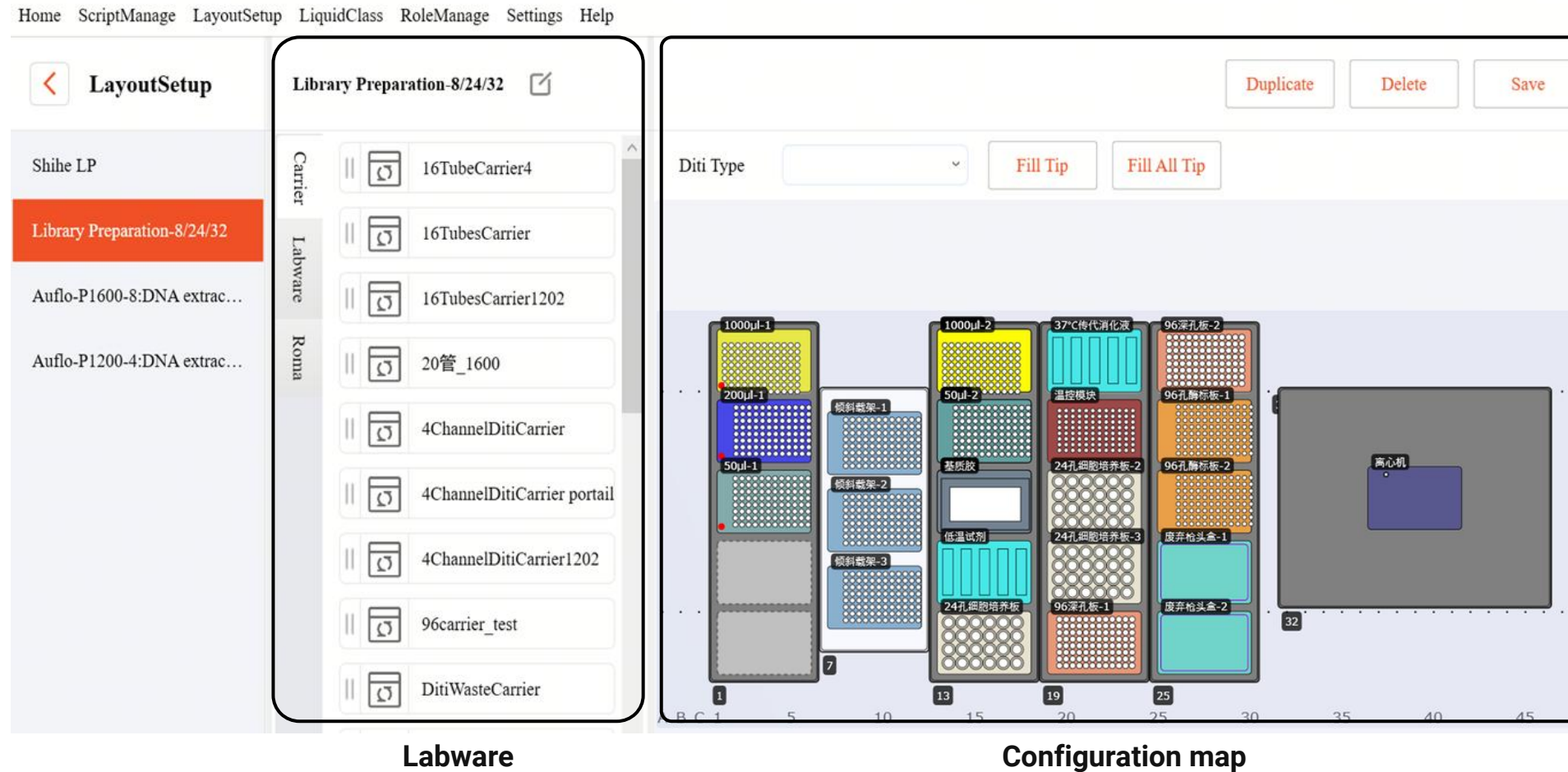
Isolate contaminants
by negative pressure
and sterilizes by UV

Flexible Configuration of Modules Spanning from Organoid Construction to Drug Screening



User-Friendly Software

Easy-to-use script generation tailored to custom workflow requirements



STEP 1

**Drag and drop
labware to customize
your own
configuration**

Customize your own
configuration based
on your application
requirements.

User-Friendly Software

Easy-to-use script generation tailored to custom workflow requirements

The screenshot displays the Galatek software interface. On the left, a vertical sidebar contains two sections: 'Liquid Handle' and 'Control Steps'. The 'Control Steps' section is active, showing a list of commands. The main area on the right is titled 'Workflow script' and contains a table with four rows of commands.

Command	Script	Order
TemperatureControl	Temperature SetTemperature 4	1
TemperatureControl	Temperature Open	2
TemperatureControl	Temperature SetTemperature 70	3
TemperatureControl	Temperature Open	4

Below the table, there is a diagram of a multi-well plate layout with various components labeled in Chinese, including '1000ul-1', '200ul-1', '50ul-1', '1000ul-2', '50ul-2', '37°C恒温块', '96孔板-1', '96孔板-2', '24孔细胞培养板-1', '24孔细胞培养板-2', '24孔细胞培养板-3', '96孔板-1', '96孔板-2', '离心瓶', and '离心管'.

STEP 2

Built-in commands, easy-to-design your own workflow scripts

Simple script creation with no programming experience required.

Quick learning curve—complex organoid culture workflows can be mastered in 2–5 days.

User-Friendly Software

Easy-to-use script generation tailored to custom workflow requirements

Home ScriptManage LayoutSetup LiquidClass RoleManage Settings Help

LiquidClass

Search

Water

Water 1000 zMax

Water 1000

Water 200 zMax

Water 200

Water 50 zMax

Water 50

Water 10 zMax

Water 10

+ Add Type

Water 1000 zMax

Volume

10-200ul

200.01-1000ul

Dispense Mode

Single Dispense

Multi Dispense

Error Handling

Aspirate

Aspirate Speed 100 ul/s

Delay 400 ms

Leading Air Gap 10 ul

Tailing Air Gap 2 ul

Excess Volume 0 ul

Conditional Volume 0 ul

Aspirate Position zMax

Aspirate Offset 0 mm

Dispense

Dispense Speed 600 ul/s

Delay 0 ms

Has Trailing Airgap Yes No

Tailing Air Gap 0 ul

Dispense Position zDispense

Dispense Offset 0 mm

Retract Position Current

Retract Offset 0 mm

System

LAG

Vol

TAG

Liquid type

Volume

Aspirate

Dispense

STEP 3

Define liquid classes to ensure accurate pipetting

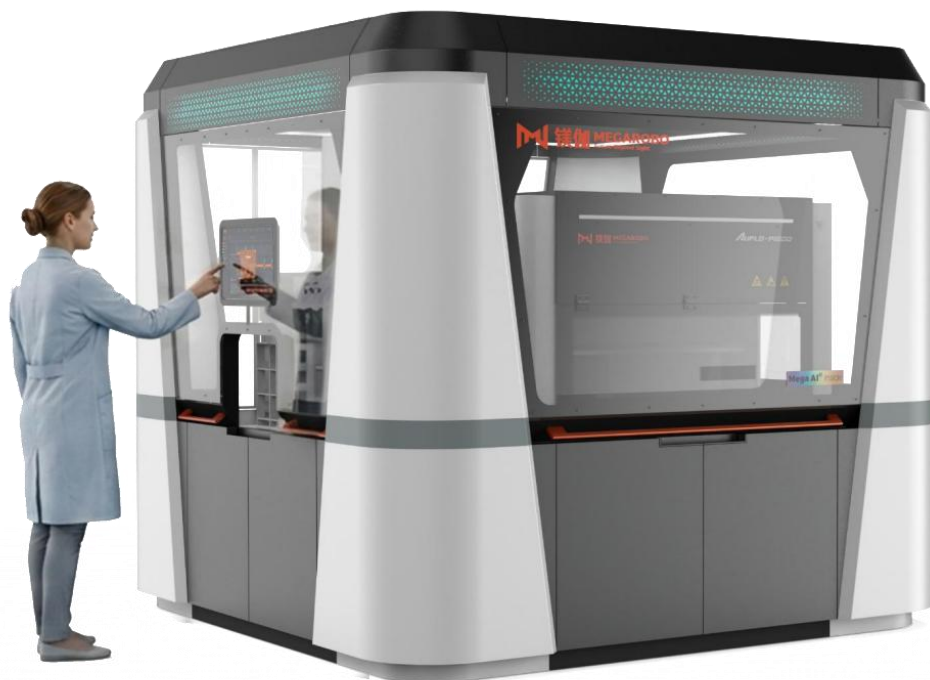
Enables optimized aspiration and dispensing parameters for different liquid types.

Automation and AI-Driven Solutions for Organoid Research

3. STANDARDIZED INTEGRATED PLATFORMS

A Game-Changer in Life Sciences

Our vision: an AI-driven, end-to-end automated organoid platform



VelaOne

Automated laboratory
execution
+ instrumentation
+ data acquisition

Civia

AI + knowledge
+ experimental design
+ decision-making
+ data analysis

Connecting scientific knowledge and experimental design with robotic execution and data acquisition to enable:



**Standardized
organoid
development**



Validation



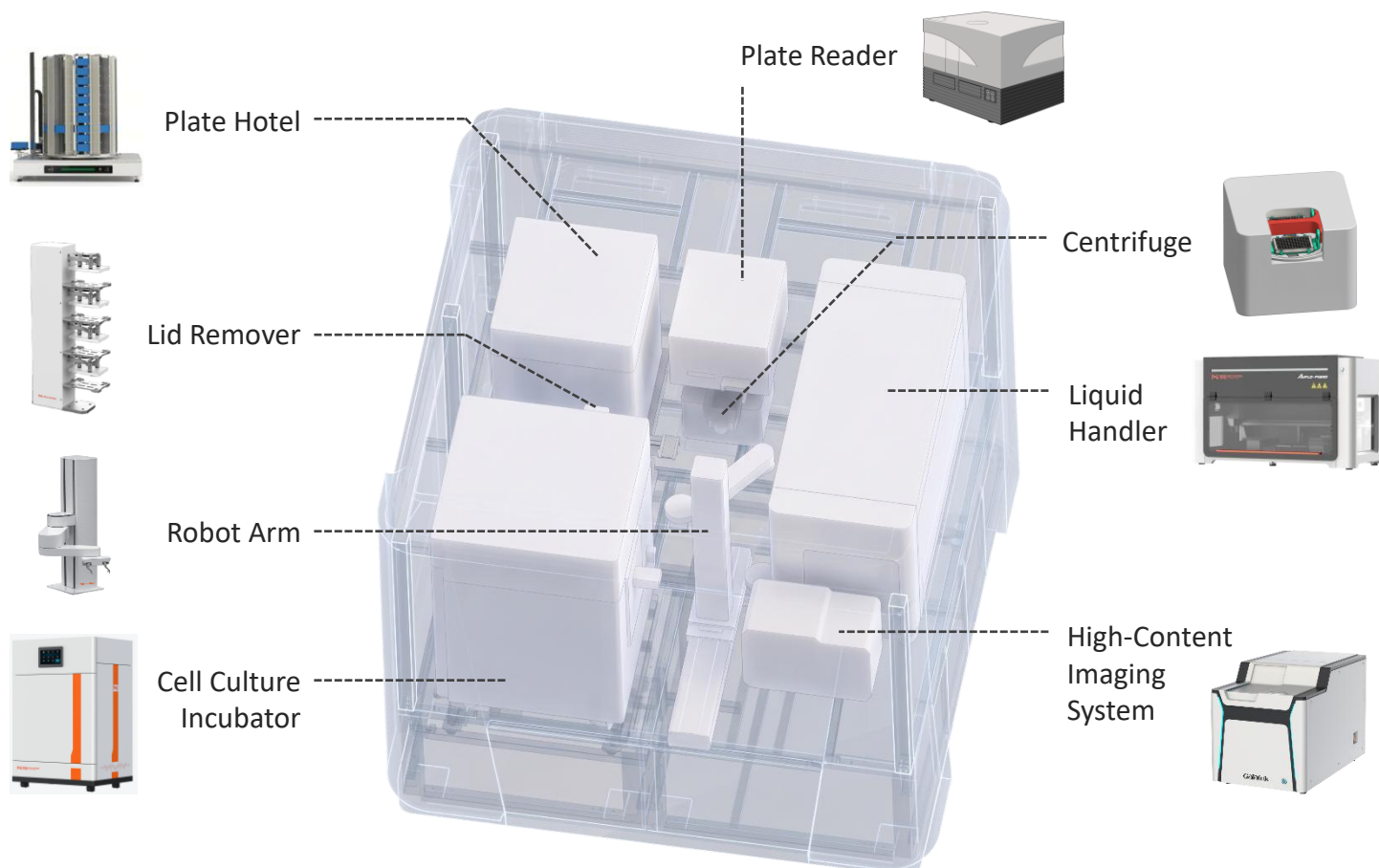
Optimization



Drug screening

Standardized Integrated Platform for Organoids

Automated Organoid Culture & Drug Screening System



Core functions:

Organoid seeding

Organoid imaging

Organoid culture & passage

Drug sensitivity testing

Throughput:

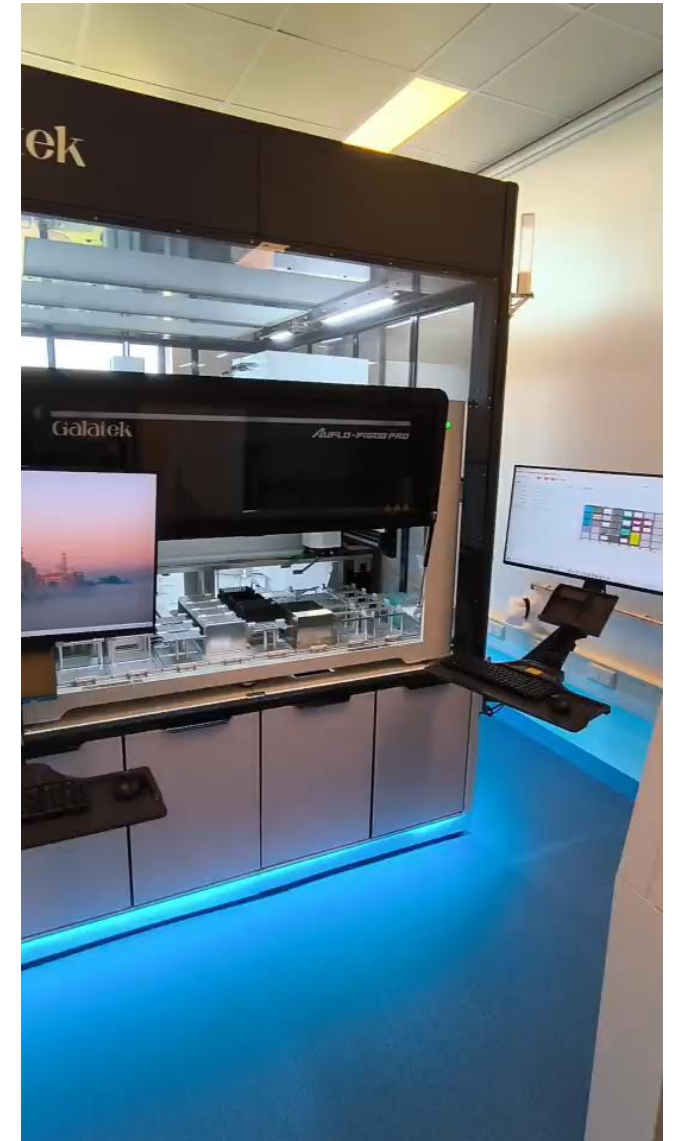
Culture: 4 tissue samples/batch,
12 tissue samples/day

Drug screening: Generation of 4,600
data points/day (using 96-well plates)

Labor force needed: 1 person
(consumable loading, replacement,
and system maintenance)

Standardized Integrated Platform for Organoids

Automated Organoid Culture & Drug Screening System



Automation and AI-Driven Solutions for Organoid Research

4. AI-DRIVEN SOFTWARE

Civia: Revolutionizing Organoid Engineering

Protocol Design, Workflow Development & Process Automation



Self-study of cutting-edge literature

Continuously updating knowledge base, and maintaining key insight into cutting-edge technologies.



Intelligent optimization of experiment

To help develop drug screening strategies and formulas, customize culture methods, and avoid ineffective attempts.



Generation of optimal experimental protocol

Automatically evaluates reagents, parameters, and instruments, and plans the most efficient experiment execution steps.

Civia: Revolutionizing Organoid Engineering

Protocol Design, Workflow Development & Process Automation

Literature Review

Formulation Comparison

Culture Media Formulation*

Recommended Workflow Development

Detailed Process Development

Plan Review & Approval

Hardware Integration & Connectivity

Equipment Preparation & Mobilization

Use Tool - ask_clarification
Need your help

Civia

Here are three recipe drafts built from the anchor paper (*Human gastric cancer modelling using organoids*, Gut 2019):

	Plan 1: Conservative Replication	Plan 2: Recombinant Optimization	Plan 3: Streamlined Core
Strategy	Exact anchor protocol	Replace conditioned media with recombinant proteins	Remove non-consensus components, align concentrations
Key Changes	None	Wnt/Rspo/Noggin → recombinant; NAC 1.25 mM; Gastrin 10 nM	Remove Pen/Strep & HEPES; FGF10 → 100 ng/mL; NAC 1.25 mM; Gastrin 10 nM
Components	14	14	12

Batch variability from conditioned media... Recombinant Wnt2a may be less potent... Regularize strict sterile techniques...

Plan 1: Conservative Replication — Anchor Paper Exact Recipe

Save to Smart Recommendations

Reagent Name	Brand	Catalog No.	Final Concentration
Advanced DMEM/F12	Gibco		
Penicillin/streptomycin	Invitrogen		
HEPES	Invitrogen		10 mmol/L
Glutamax	Invitrogen		
B27	Invitrogen		1x
N-Acetylcysteine	Sigma-Aldrich		1 mM

How can I assist you today?

Civia: Revolutionizing Organoid Engineering

Protocol Design, Workflow Development & Process Automation

- Literature Review
- Formulation Comparison
- Culture Media Formulation
- Recommended Workflow Development**
- Detailed Process Development***
- Plan Review & Approval
- Hardware Integration & Connectivity
- Equipment Preparation & Mobilization

Use Tool - ask_clarification

Need your help

Civia

Here's the recommended culture workflow for Plan 1 (Conservative Replication) — 3 phases: Seeding & Medium Prep → Culture Condition Check → Passaging & Expansion. The full process table is shown above

Based on your previous experiments, we recommend the following workflow.

Recommended Process Workflow

#01

Seeding & Medium Prep

#02

Culture Condition Auto-Check

#03

Passaging & Expansion

Process Details

Business Phase

Workflow

Step #

Step

Equipment

Execution

How can I assist you today?

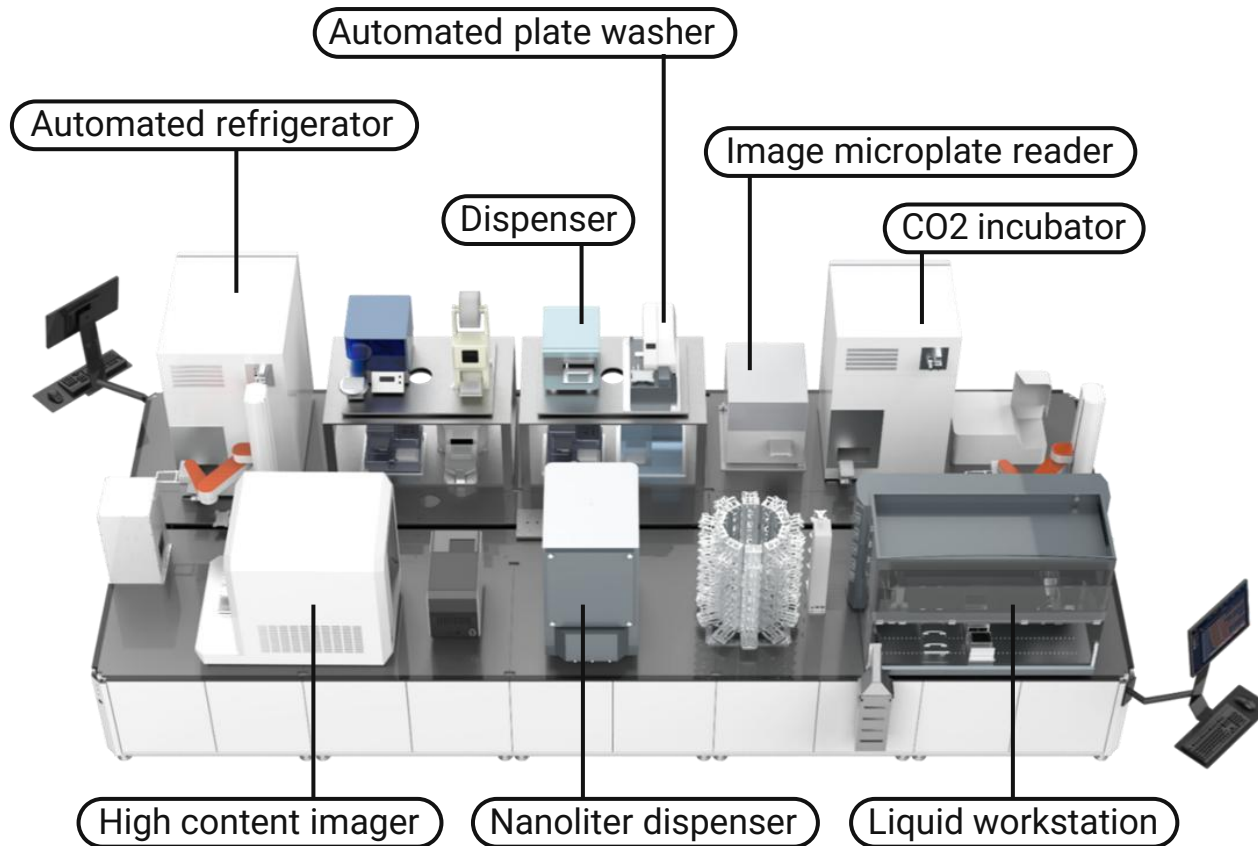
Process Details

Business Phase	Workflow	Step #	Step	Equipment	Execution
Organoid Culture	Seeding & Medium Prep	1	Robot picks empty 24-well plate #1 from the stacker	Robot, stacker	Auto
		2	Lid-off empty 24-well plate #1	Robot, lid remover	Auto
		3	Robot transfers empty 24-well plate #1 to Auflo workstation	Robot, Auflo	Auto
		4	Robot picks 96-well split plate #2 from the stacker to Auflo	Robot, Auflo	Auto
		5	Auflo runs primary organoid spotting program on the 24-well plate	Auflo	Auto
		6	Auflo runs medium formulation program	Auflo	Auto
		7	Auflo runs medium-dispensing program on 24-well plate #1	Auflo	Auto
		8	Robot moves 24-well plate #1 to the incubator	Robot, Auflo, incubator	Auto
		9	Robot returns the 96-well split plate to the stacker	Robot, Auflo, stacker	Auto

Automation and AI-Driven Solutions for Organoid Research

5. CUSTOMIZED INTEGRATED PLATFORMS

Customized Integrated Platform for Organoid Culture



Core functions:

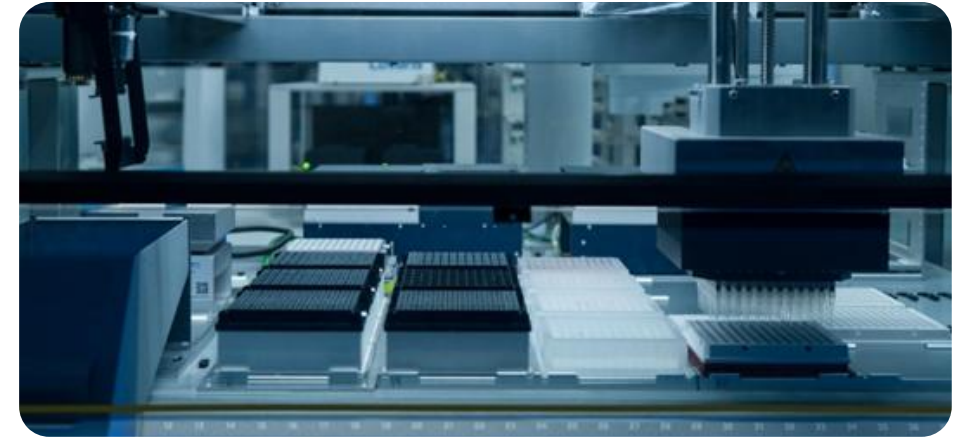
Organoid seeding

Organoid culture & passage

Organoid imaging

Drug sensitivity testing

Customized Integrated Platform for Organoid Culture



What Makes Our Solutions Stand Out



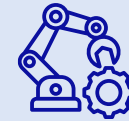
Reliable and Reproducible Organoid Workflows

Automate all steps across the organoid workflow to **reduce operator-dependent variability, standardize protocols and improve consistency**. This enables experiments to scale while maintaining control over quality and reproducibility.



Unmatched Throughput

Achieve up to **40× higher throughput, 100× greater data generation and 1,000× faster processing**, enabling substantially more experiments and data to be generated from the same resources.



Scientists Focus on Science, Not Automation

Scientists can focus on experimental design and biological questions rather than the complexity of operating and integrating automated systems.

An intuitive software layer—including **natural-language interaction**—makes sophisticated automation accessible **without requiring specialized robotics or programming expertise**.



Data Integrity, Standardization & Compliance

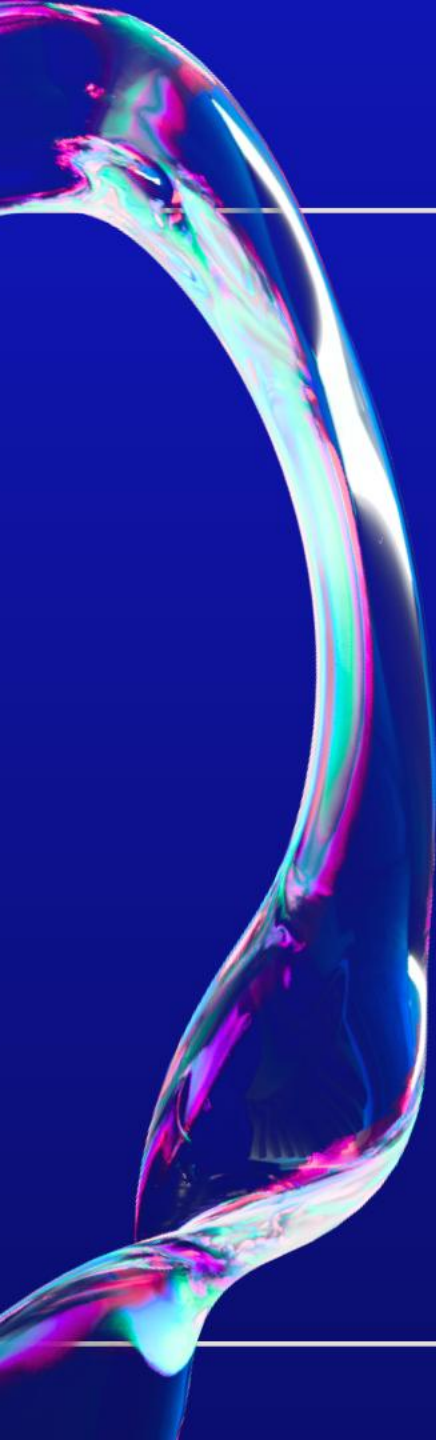
Orchestrate instruments, acquire and process data, and associate results with the relevant experimental context.

Standardized digital records improve traceability, while reducing errors associated with manual data handling and fragmented workflows.



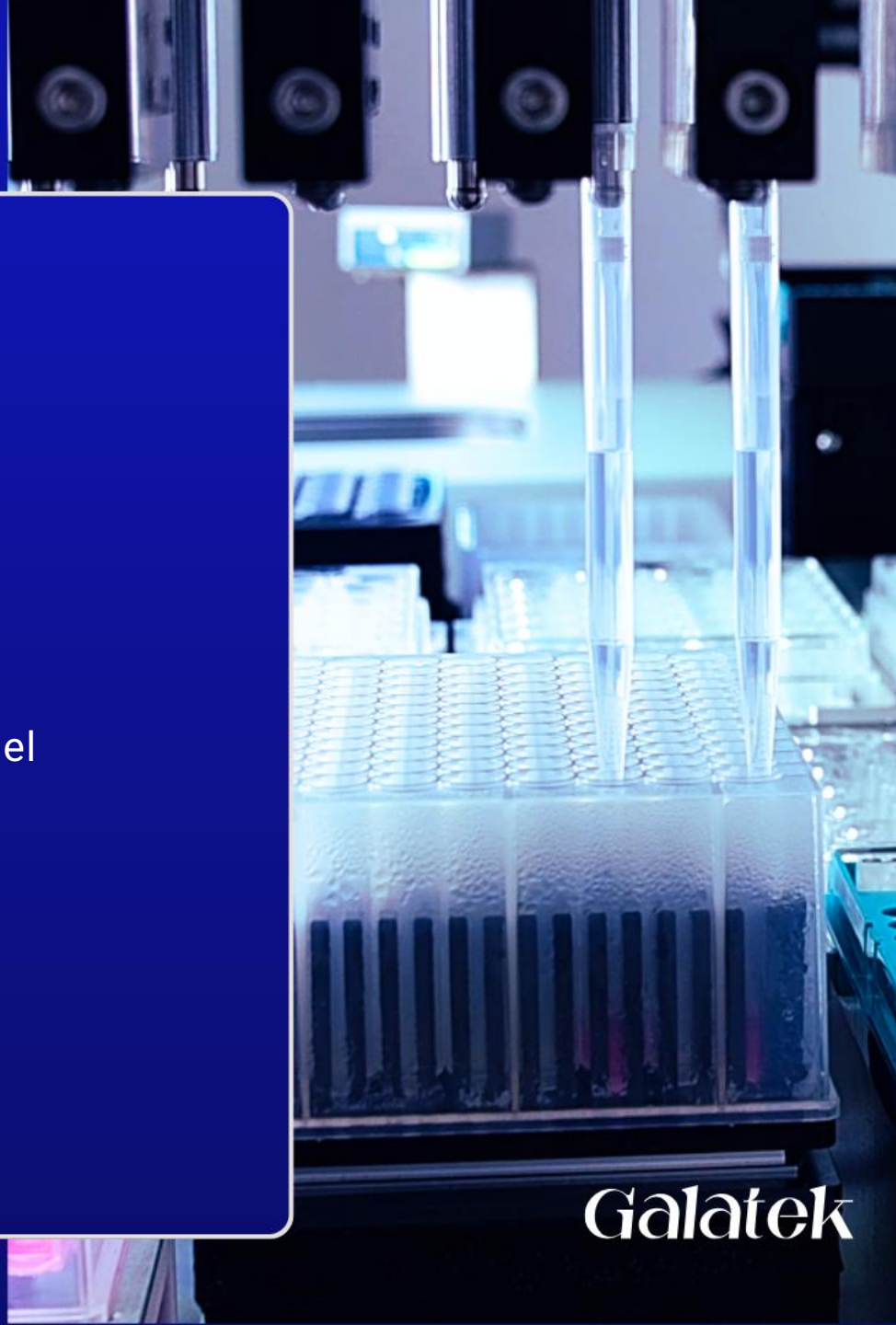
End-to-End Intelligent Automation

Combine robotics, automation, AI, analysis and orchestration software within a single framework. Real-time analysis can feed information back into the workflow, enabling experiments to be adjusted based on data as they run—creating an **intelligent, closed-loop wet-lab/dry-lab system**.

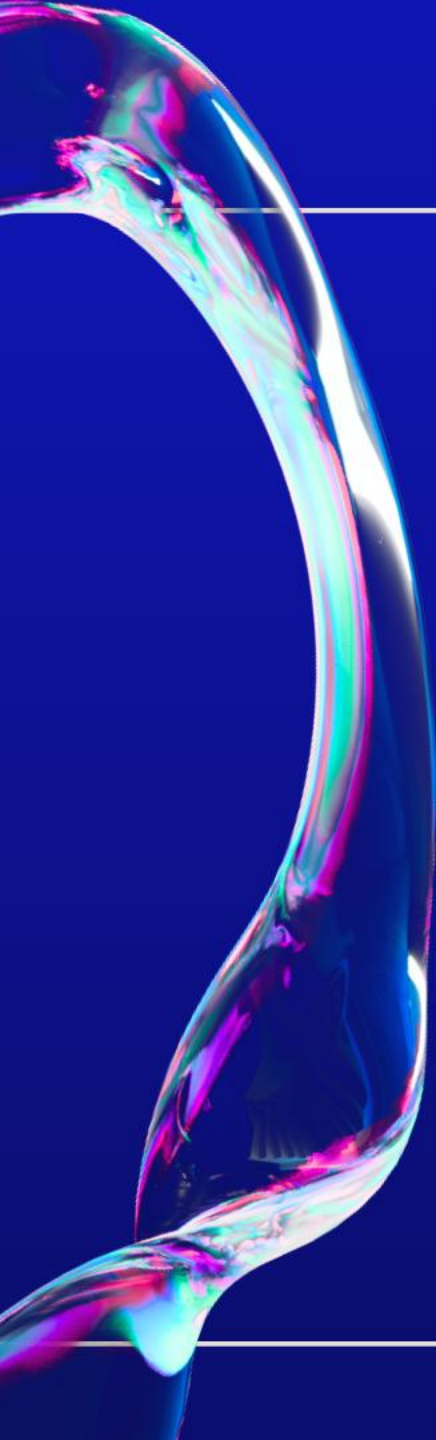


Adopting automation in the lab offers several advantages.

- ✓ Improved Accuracy & Reproducibility
- ✓ Reduced Hands-on Workload for Lab Personnel
- ✓ Improved Standardization
- ✓ Support for Scalability & Innovation



Galatek



All types of instruments can be integrated in our platforms.

We provide comprehensive connectivity by supporting the integration of third-party devices.

Up to now, we have supported the integration of +230 device models, including:

Liquid handling workstations

Incubators

Centrifuges

Microplate readers

Cell imaging instruments

Liquid dispensers

Flow cytometers

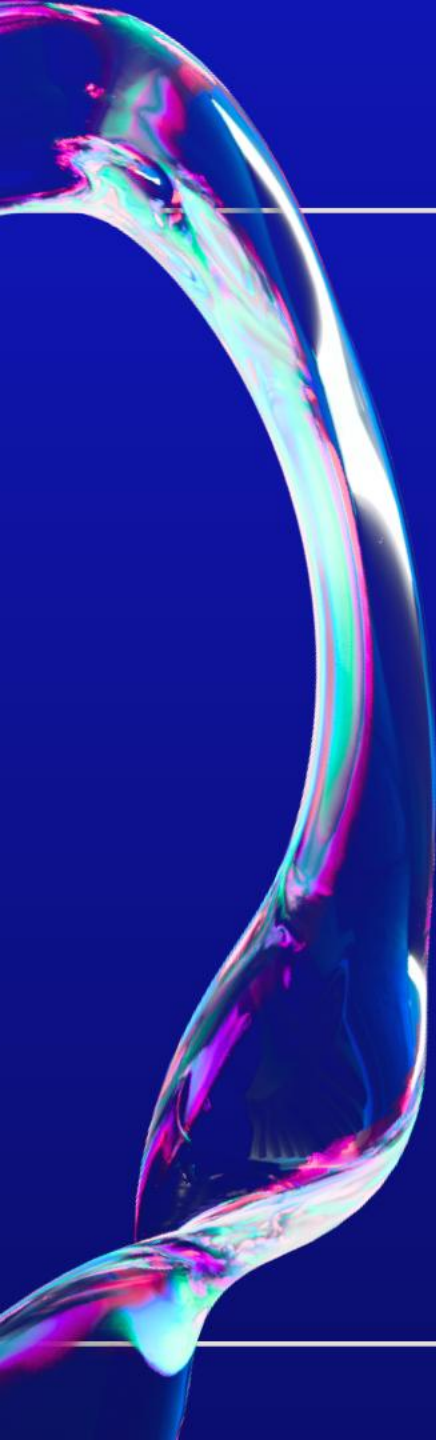
Cell counters

Microplate labelers

Film sealer and peeler



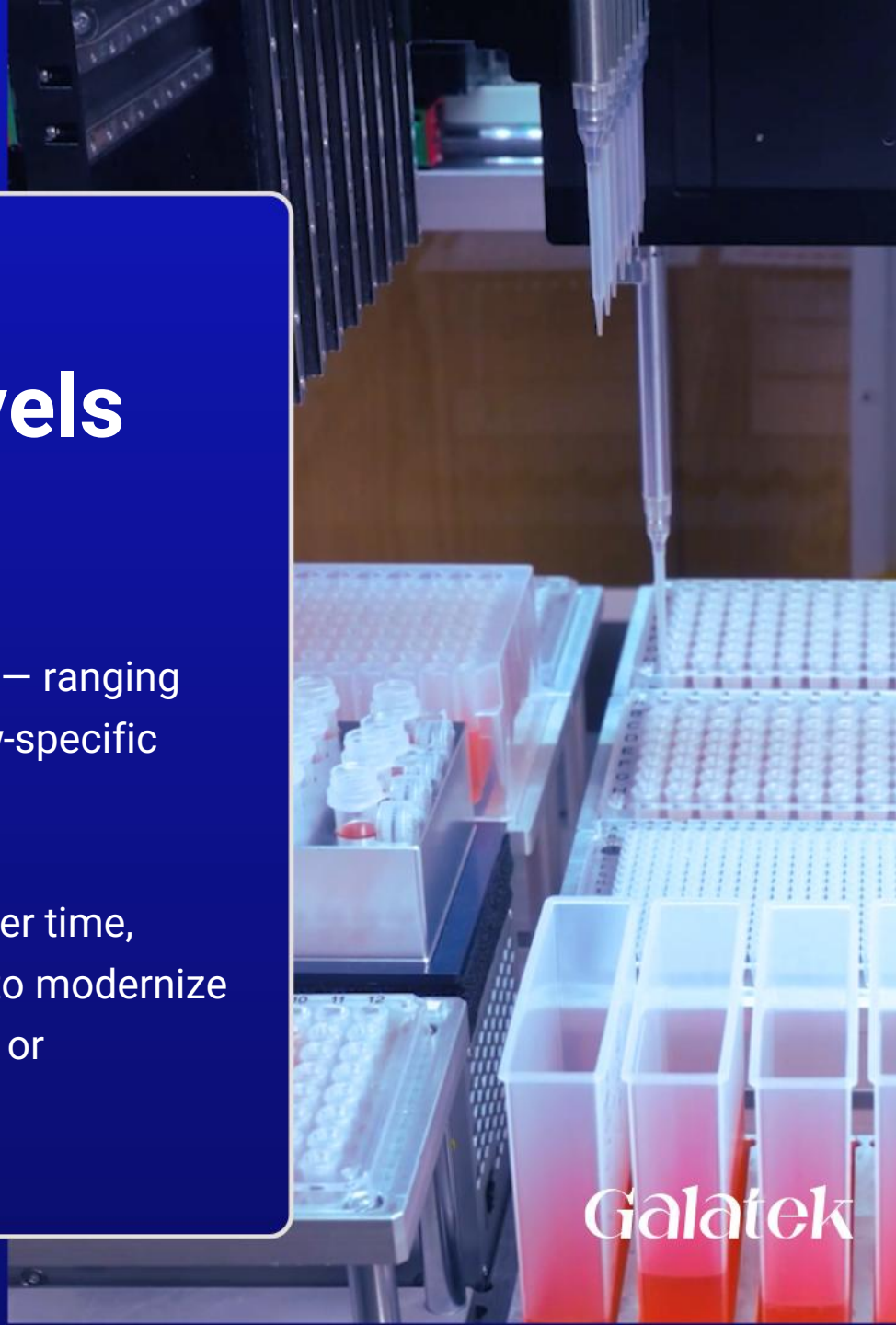
Galatek



From partial to full automation, several levels are possible.

We offer a tiered portfolio of automation solutions — ranging from standalone instruments to targeted, workflow-specific platforms, and fully integrated systems.

Our platforms are designed to scale seamlessly over time, providing organizations with the flexibility needed to modernize at their own pace, without unnecessary complexity or disruption.



Galatek

Thank you for your attention.

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