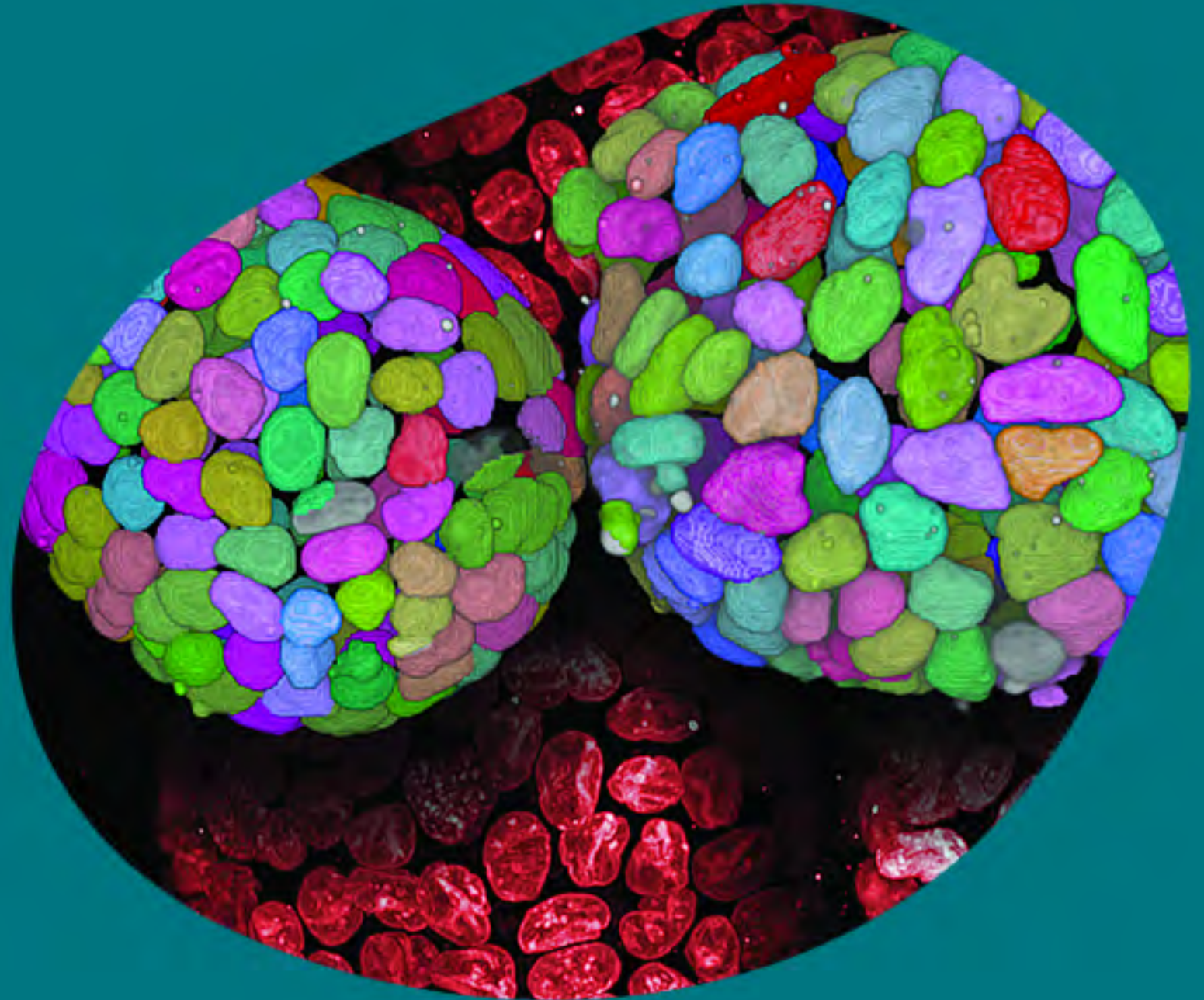


Upscaling organoid
research for sharper
biological insights.



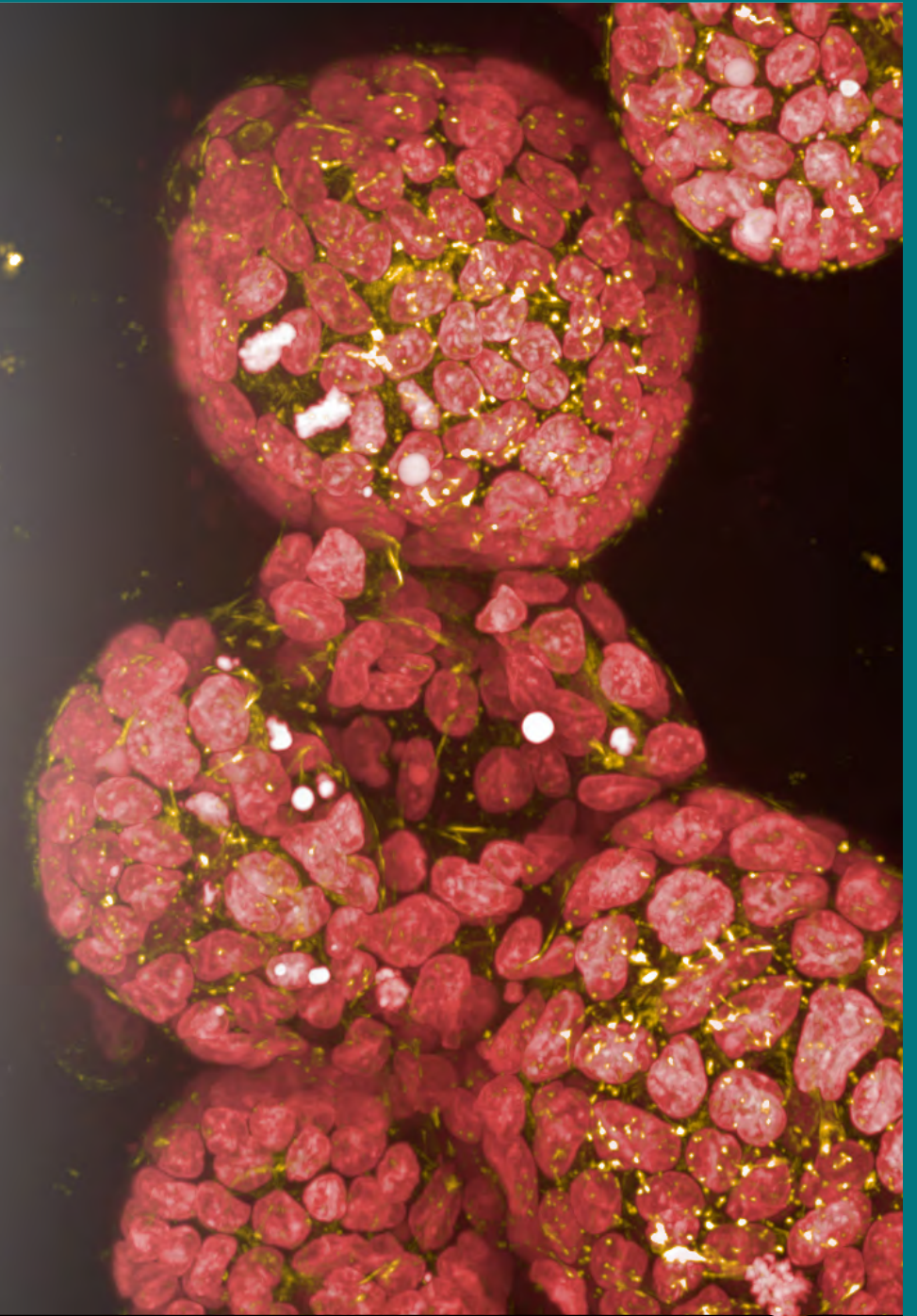
revvity

For research use only. Not for use in diagnostic procedures.

Unravel the mysteries of human disease

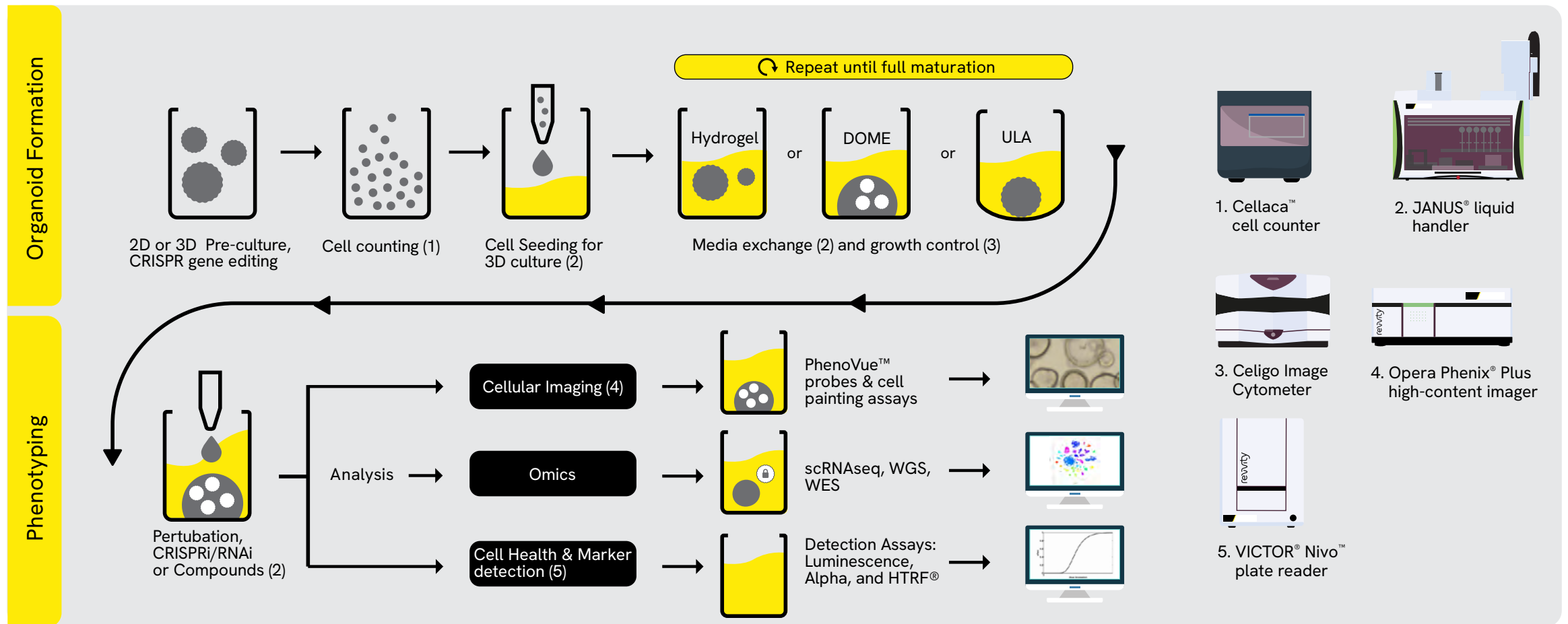
Organoids provide an opportunity to create cellular models of human disease, which can be used to understand underlying disease mechanisms and identify possible treatments. However, the culture and analysis of organoids presents complex challenges, especially when it comes to scaling up for drug discovery purposes.

This guide will help you navigate these challenges and find innovative solutions to enhance organoid research.



The organoid research workflow

An organoid experiment can take between 7-10 weeks, requiring many steps that bear equally as many potential sources of error. To scale up, standardize and achieve greater biological insights, researchers need to rely on automation and multi-dimensional datasets.



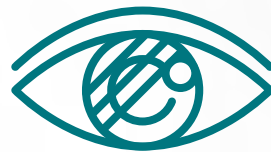
Seamless science from culture to insights with automation

Scale up your organoid workflows by integrating market-leading platforms. Our flexible, modular workstation solutions allow you to:



Gain back time

Ensure skilled researchers aren't tied to cell culture



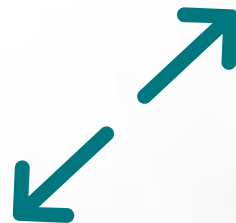
See everything

Resolve the subtlest phenotypic changes with high-end imaging



Reproduce results

Remove human error and technical sources of heterogeneity



Increase scale

Rapid processing provides the capacity to increase experiment scale



Organoid research stories

We have helped leading institutions discover new ground with automated solutions for organoid development and analysis. Our custom workstations are helping researchers address their organoid challenges every day. Read their stories.



Nathan Gödde, Ph.D.,
Manager Australian Organoid Facility
University of Queensland,
Australia

"The modular design of our custom-built Cell::Explorer system future proofs our facility so we can keep pace with the rapid growth and demand for the kinds of biologically complex models we make."



Ben Hopkins, Ph.D.,
Asst. Professor Genetic and Genomic Sciences,
Mount Sinai School of Medicine, New York, USA

"Our workstation integrating the CLS and Phenix high content imagers allows us to rapidly test thousands of treatments across hundreds of patient derived organoid models in a highly reproducible and stable manner, so we can rapidly identify tumor specific drug sensitivities."



Dr. Lynn McGarry,
High-Content Imaging Lead,
CRUK Beatson Institute,
Glasgow, UK

"What we get from the Opera Phenix/plate::handler combo is the ability to combine high-content with high-throughput."

Meet our customers



Case study: Australian Organoid Facility (AOF), University of Queensland, Australia

Nathan Gödde, Ph.D.,
Manger Australian Organoid Facility

The goal:

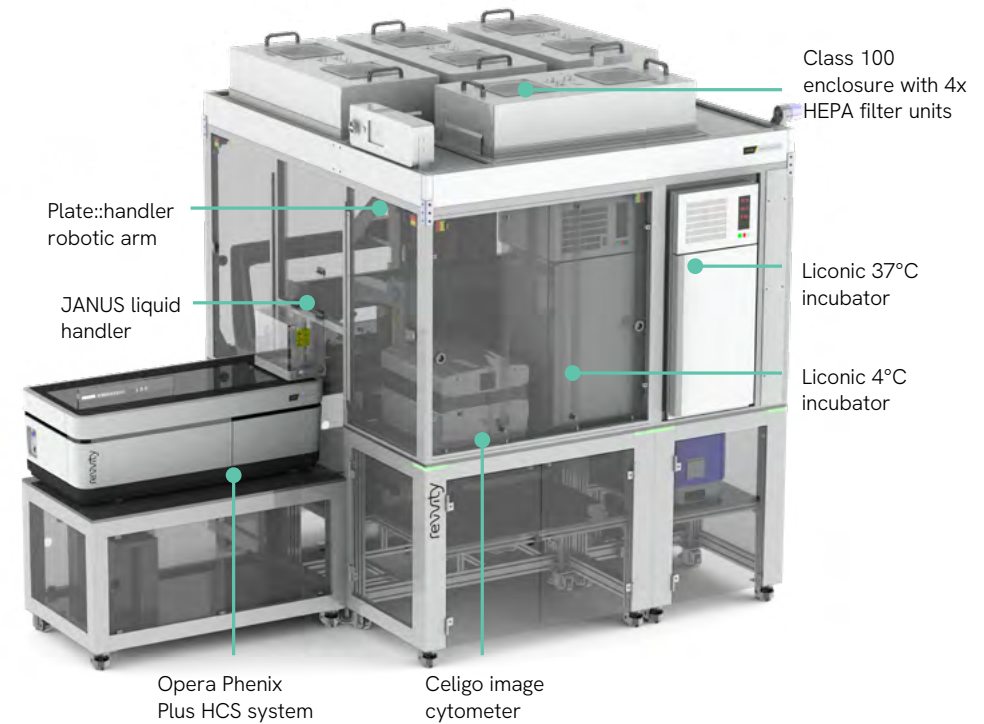
Providing quality-assured and standardized organoids at a greater scale and innovating complex 3D biological research.

The build:

Custom-built explorer G3 organoid/3D workstation with HEPA-filtered enclosure for organoid culture, monitoring, and high-content imaging.

The solution:

The AOF can now automate a range of protocols for organoid production and can phenotype effects from various treatments using high-content assays. Through automation, their organoids are much more affordable at scale.



Nathan
Queens
Flexibili
experim
"Need T





Case study: Mount Sinai School of Medicine, USA

Ben Hopkins, Ph.D.,
Asst. Professor Genetic and Genomic Sciences

The goal:

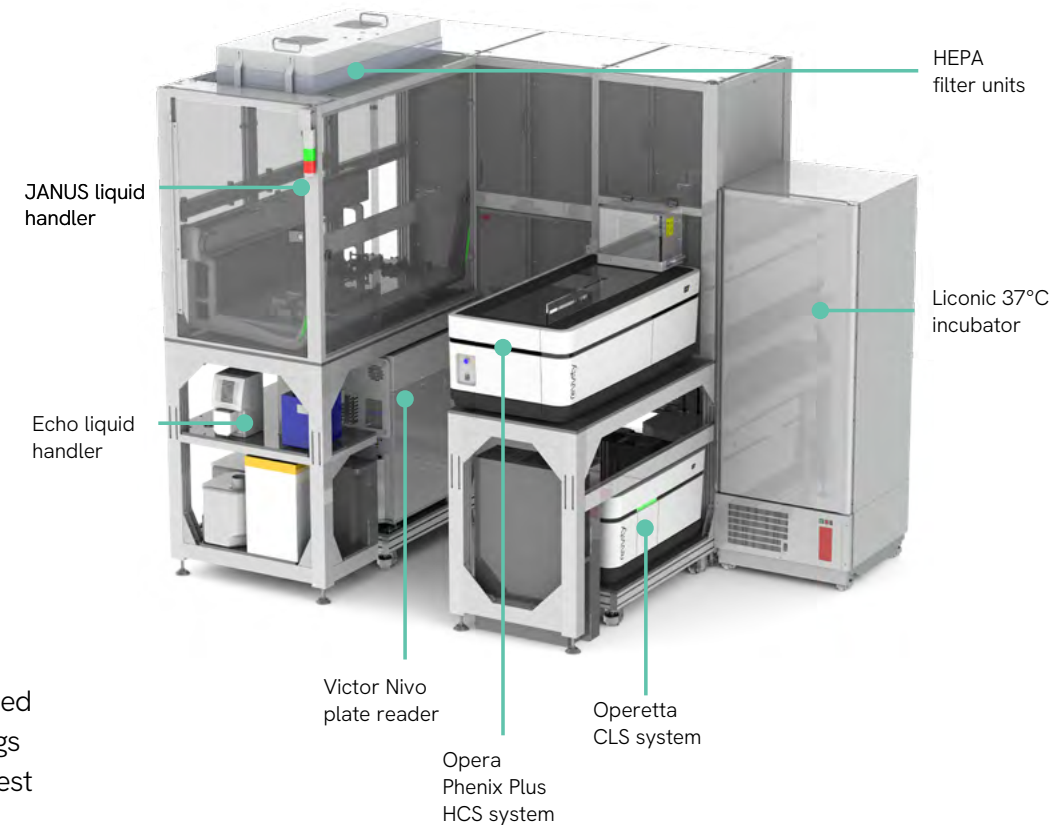
To establish functional drug testing of multiple treatment options in patient-derived cancer organoids within clinically relevant time frames. Need to fit into a very small laboratory.

The build:

Custom-built explorer G3 organoid/3D workstation with HEPA-filtered enclosure for culture, non-contact compound dispensing, multi-mode detection, and live cell high-content imaging.

The solution:

Within 3 years, Mount Sinai School of Medicine have tested 200 patient-derived samples for drug sensitivity. After organoid expansion, they can test 338 drugs with 6-point dose-response curves in triplicate over 14 days. They can also test drug combinations to identify agents that cooperate.



Nathan
Queens
Flexibili
experim
"Need T



Meet our customers



Case study: Cruk Beatson Institute Glasgow, UK

Dr. Lynn McGarry,
High-Content Imaging Lead

The goal:

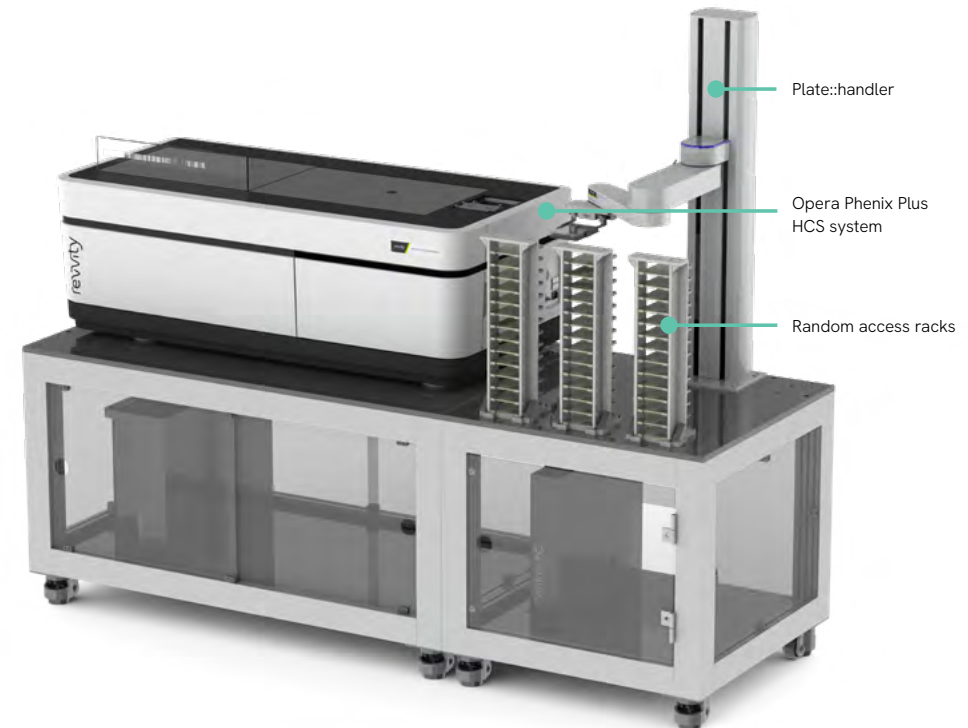
Perform high-quality confocal imaging at high throughput. Need to handle large numbers of plates.

The build:

Opera Phenix combined with plate::handler and random-access racks.

The solution:

The Beatson Institute can run high-throughput HCS screens in 2D and projects in 3D in 384 well format. In 2D, they have processed up to 800 plates. In a colorectal cancer project with 3D organoids, they analyzed batches of 12 plates to identify novel drugs or novel drug combinations.



Nathan
Queens
Flexibili
experim
"Need T

LEARN MORE

LEARN MORE

LEARN MORE

LEARN MORE



Click the yellow button to learn more about each component.

The Components

1.

Automate the formation and analysis of organoids and spheroids, providing flexibility and customization

5.

Extract quantitative multi-parametric data from organoids at the single-cell level

4.

Analyze organoid health and maturation during the growth phase or as endpoint

Incubate samples

Incubate samples at 4°C and 37°C

Move plates

3.

Perform media exchanges and compound additions, handle hydrogels and generates dome cultures

2.

Efficiently schedule and manage protocol steps, including dynamic and static scheduling

Wash plates

Protect samples

Seal and peel your plates

Centrifuge

Efficiently spin down liquids in plates

Analysis

7.

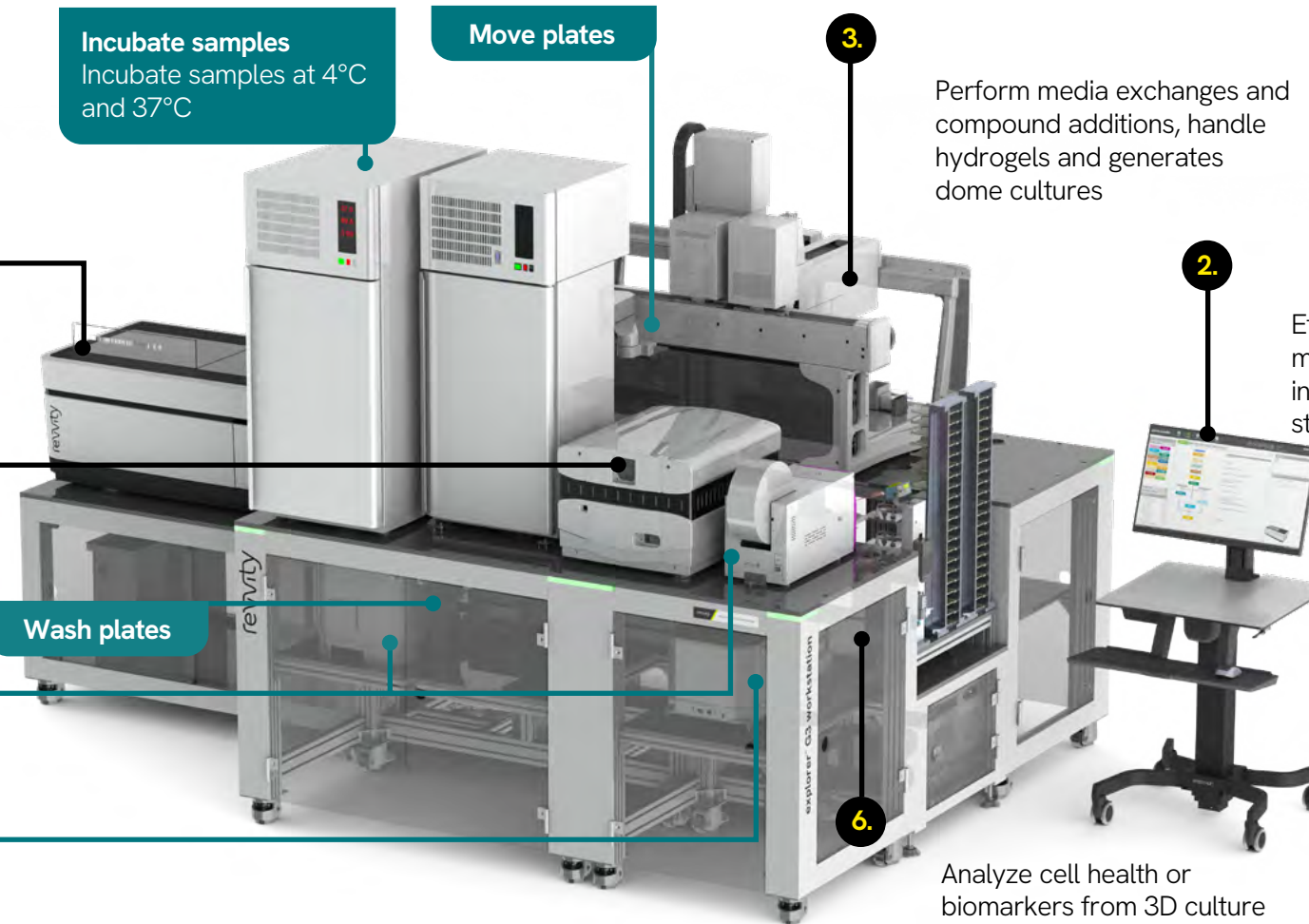
8.

6.

Analyze cell health or biomarkers from 3D culture supernatants

9.

10.



Click the yellow button to learn more about each component.

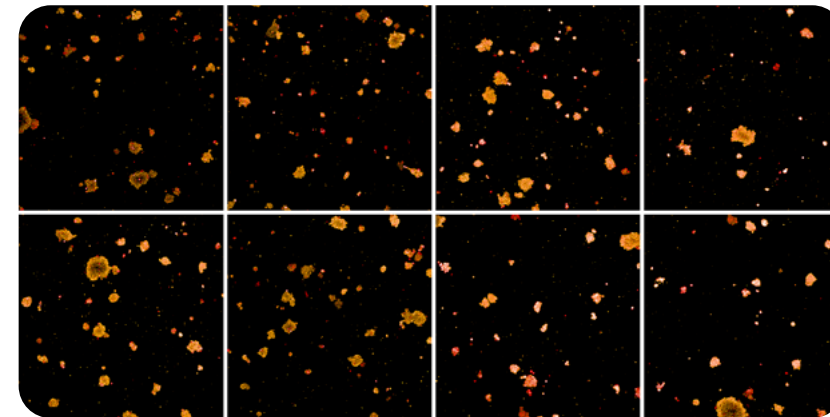
1 Organoid workstation

explorer G3 organoid/3D workstation

Everyone wants more hours in their day. You'll gain back valuable time with our automated organoid platform that operates 24/7, streamlining routine lab work.

Our explorer G3 organoid/3D workstation is a flexible, modular workstation that automates the formation and culture of organoid and spheroid models, followed by image-based phenotyping and marker analysis using multimode detection.

The workstation is customizable according to your applications. All key instruments and software are provided by Revvity, so you can be sure of a cohesive and seamless workflow.



liquids in centrifuge plates

supernatants

9.

Enabling reagents

10.

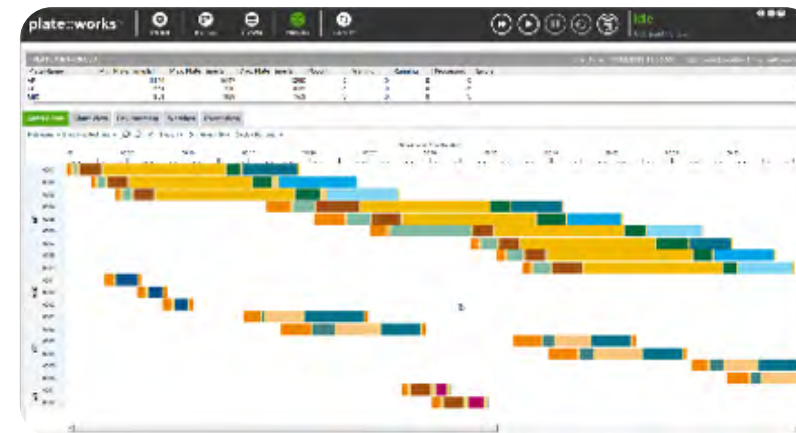
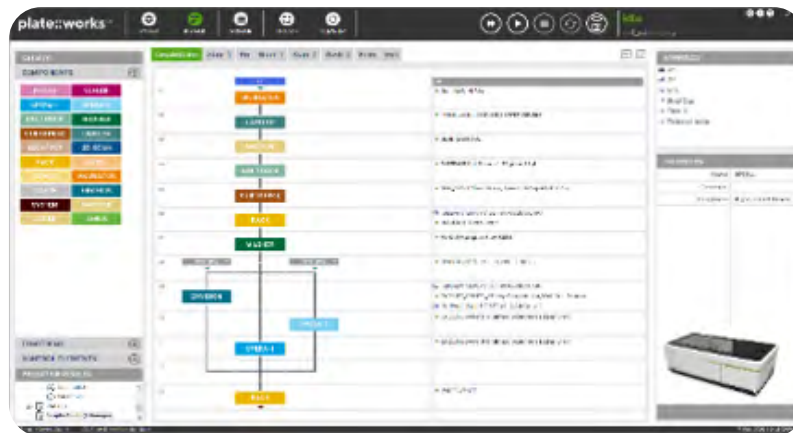
Reliable consumables

Click the yellow button to learn more about each component.

2 Schedule protocols

Plate::works scheduling & control software

Now you can standardize your processes, ensuring consistent protocols and reducing human bias.



Increase throughput and efficiency with parallel methods and sample tracking, and use the workstation at capacity. You can create workflows simply by using the intuitive drag-and-drop interface for instrument icons.

liquids in centrifuge plates

supernatants

9.

Enabling reagents

10.

Reliable consumables

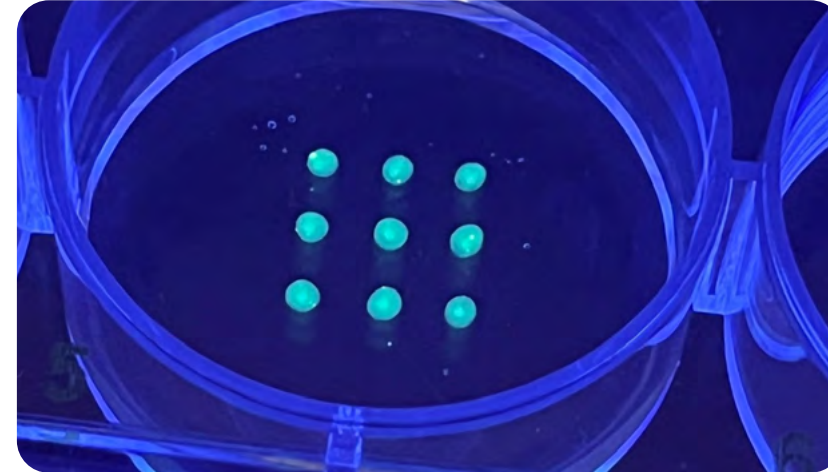
Click the yellow button to learn more about each component.

3 Move liquids

JANUS liquid handler

To err is human. You can now minimize errors and create reproducible cultures by pipetting defined volumes with automated liquid handling.

The JANUS liquid handler enables you to reliably automate media exchanges and compound additions, handle hydrogels such as matrigel with a cold block, and generate dome cultures.



liquids in centrifuge plates

supernatants

9.

Enabling reagents

10.

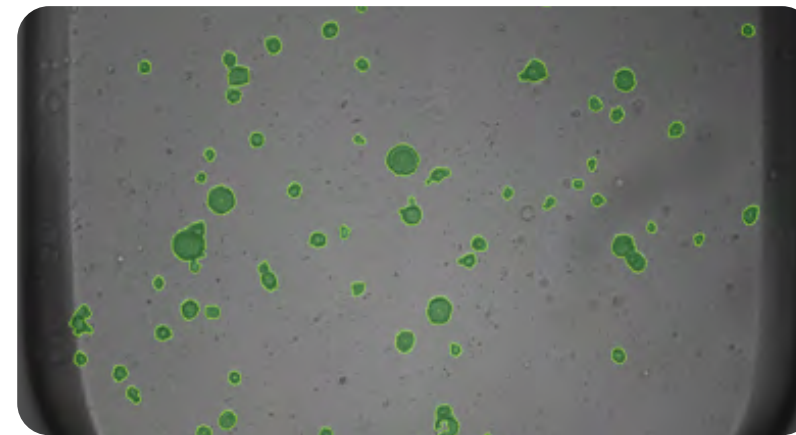
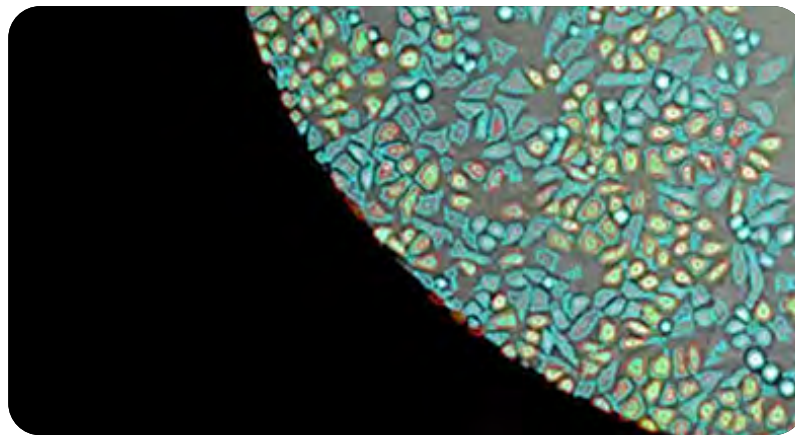
Reliable consumables

Click the yellow button to learn more about each component.

4 Monitor organoids

Celigo image cytometer

You can trust these images now more than ever. With whole well imaging you never miss your cells or organoids.



Accurately count your cells and analyze organoid health and maturation during the growth phase or as the endpoint.

liquids in centrifuge plates

supernatants

9.

Enabling reagents

10.

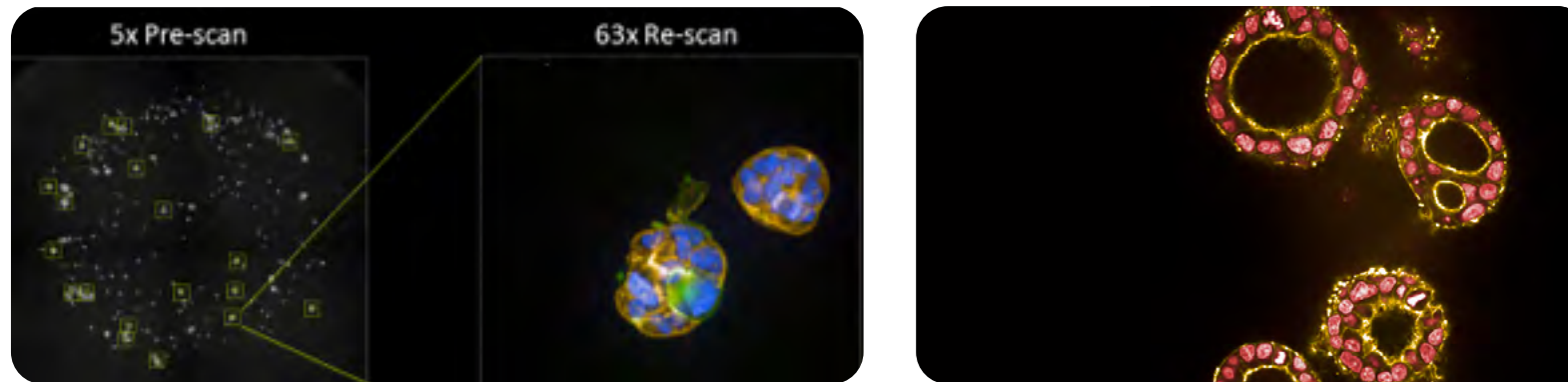
Reliable consumables

Click the yellow button to learn more about each component.

5 Confocal 3D imaging

Opera Phenix Plus high-content imaging system

See what you have been missing. Hardware designed to capture every phenotypic detail.



The Opera Phenix Plus enables you to identify the position of organoids for imaging at higher resolution and extracts quantitative multi-parametric data from organoids at the single cell level.

liquids in centrifuge plates

supernatants

9.

Enabling reagents

10.

Reliable consumables

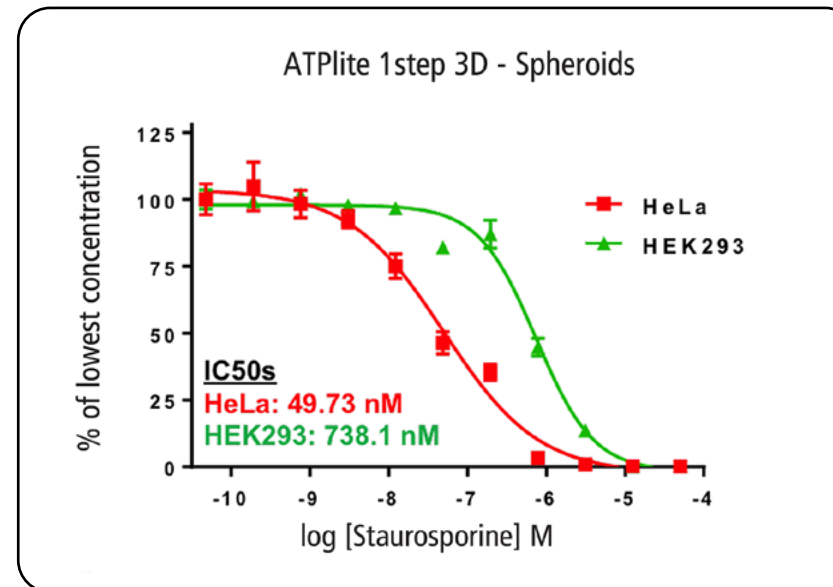
Click the yellow button to learn more about each component.

6 Detect analytes

Multimode plate reader & detection reagents

Ready to fast-track your research? Our powerful microplate readers produce better results - every time.

Get swift and reliable cell health detection for 3D cultures by measuring ATP-based luminescence with a one-step addition.



liquids in centrifuge plates

supernatants

9.

Enabling reagents

10.

Reliable consumables

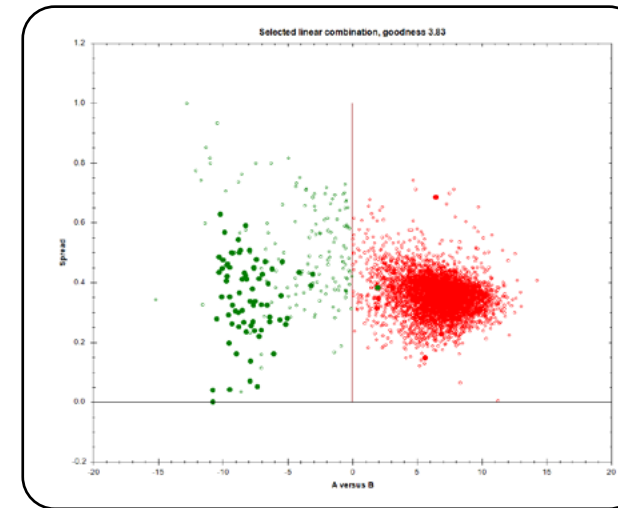
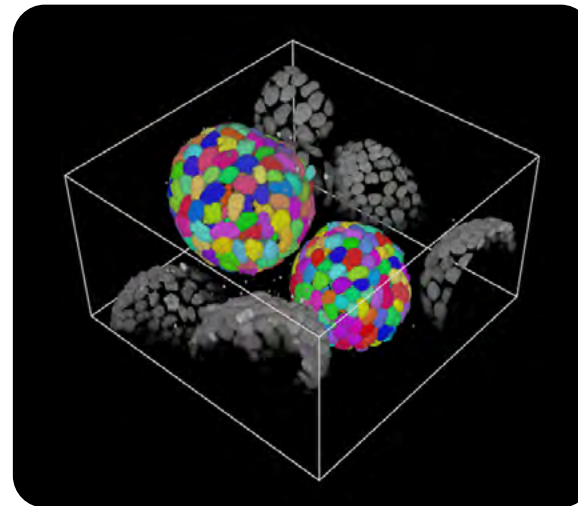
Click the yellow button to learn more about each component.

7 Image analysis

Harmony image analysis software

From pixels to numbers, extract quantitative phenotypic information from your high-content images.

Analyze complex cellular models in 3D, reliably discriminate phenotypes, and transform biological data into knowledge.



liquids in centrifuge plates

supernatants

9.

Enabling reagents

10.

Reliable consumables

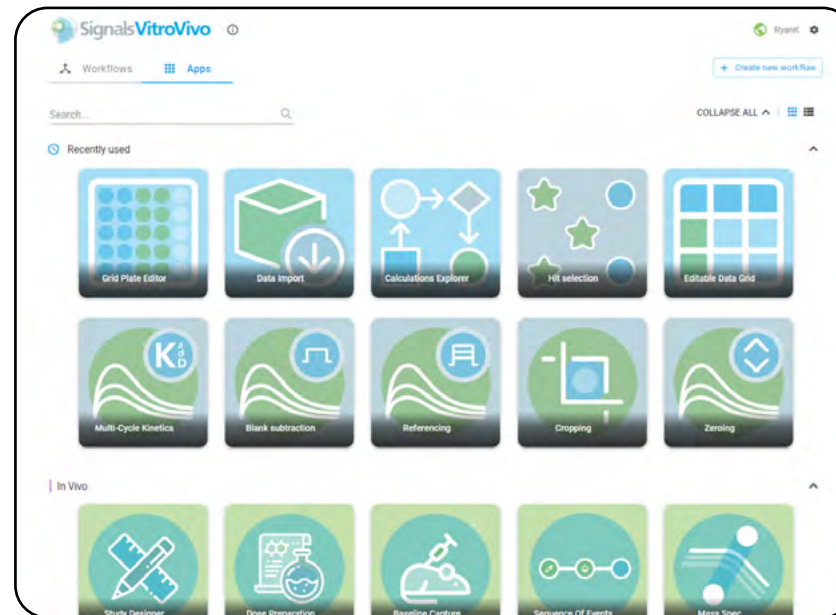
Click the yellow button to learn more about each component.

8 Data analysis

Signals VitroVivo data analysis software

Our unified data analysis software guides you all the way — from numbers to conclusions.

You can quickly process, analyze, share, and store the vast volumes of data generated by high-content screening and cellular imaging of 3D objects to get answers sooner. Intuitive apps are available for all assay instrument data from HTS, HCS, SPR, and *in vivo* in Signals VitroVivo® software.



liquids in centrifuge plates

supernatants

9.

Enabling reagents

10.

Reliable consumables

Click the yellow button to learn more about each component.

9 Enabling reagents

Achieve human-relevant results with reliable, ready-to-use reagents.



Fluorescent probes and kits - optimized for HCS

- Cell painting kits
- Organelle dyes
- Functional dyes
- Secondary antibodies



Hydrogels - automation compatible

- Animal free
- Reproducible
- Stable at room temperature
- Tunable stiffness

liquids in centrifuge plates

supernatants

9.

Enabling reagents

10.

Reliable consumables

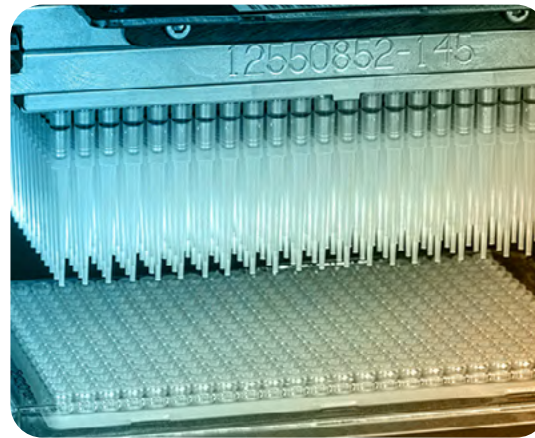
Click the yellow button to learn more about each component.

10 Reliable consumables

Microplate pipet tips and reservoirs

Rely on carefully designed and produced consumables for maximum accuracy and precision.

ULA-coated microplates for the reliable generation of organoids or spheroids. Plus, precise disposable tips and reservoirs or throughs for on-deck storage of liquids - choose the best option based on your specific application needs.



liquids in centrifuge plates

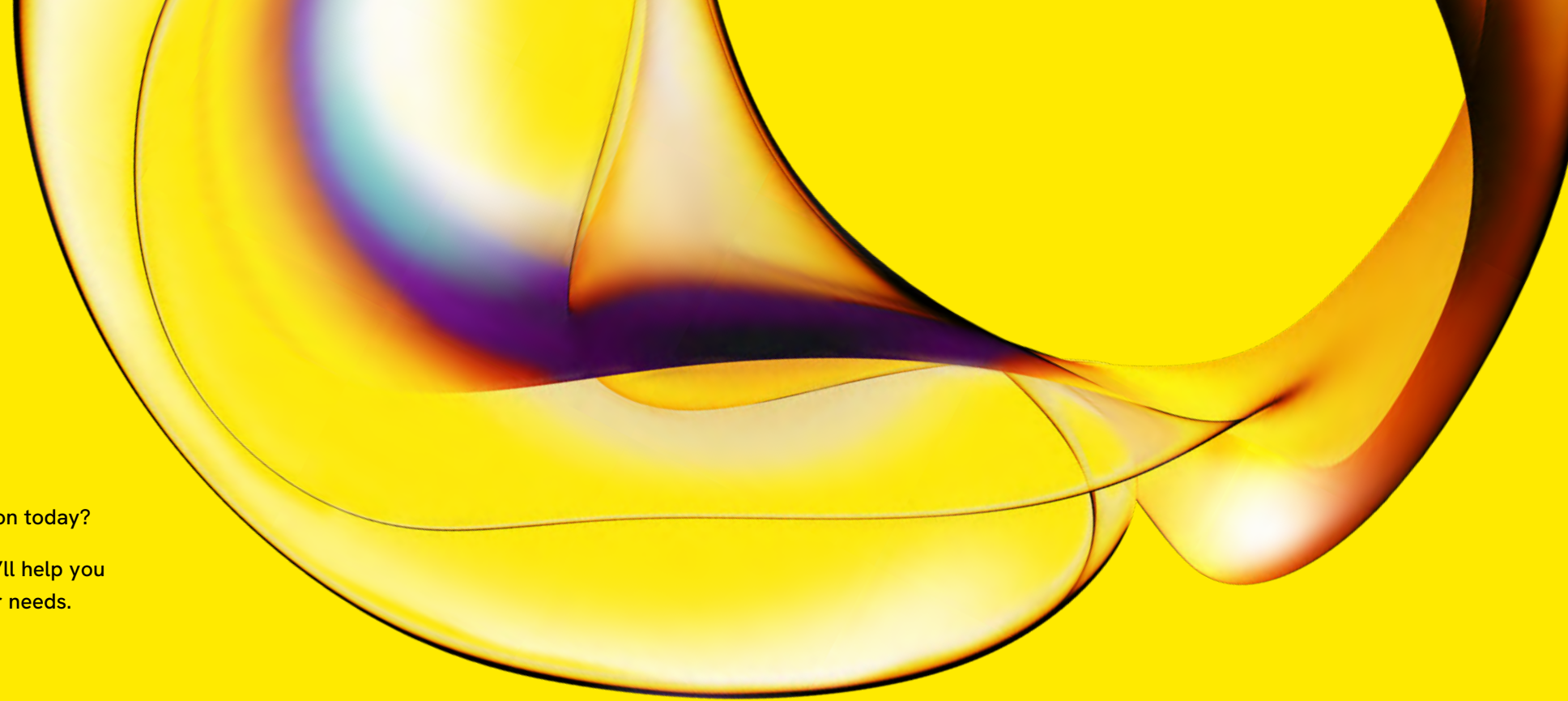
supernatants

9.

Enabling reagents

10.

Reliable consumables



Ready to start building your workstation today?

Share your challenges with us, and we'll help you create the right solution to match your needs.

www.revivity.com

revivity

Revvity, Inc.
940 Winter Street
Waltham, MA 02451 USA
www.revivity.com

For a complete listing of our global offices, visit www.revivity.com
Copyright ©2024, Revvity, Inc. All rights reserved.

1338207 (1271254)