

Grow

Monitor and feed

Scale



CellXpress.ai

Automated Cell Culture System

The future of cell culture



The future of cell culture backed by data-driven science.

CellXpress.ai Automated Cell Culture System automates 3D biology, improves workflows, and makes assays more reliable and reproducible.

CellXpress.ai™ Automated Cell Culture System is an AI-driven cell culture innovation hub that automates processes, improves workflow, and makes assays more reliable and reproducible with machine learning-assisted monitoring, feeding, imaging, and scheduling.

This revolutionary system gives your team total control over demanding feeding and passaging schedules—eliminating time in the lab while maintaining a 24/7 schedule for growing and scaling multiple stem cell lines, spheroids, or organoids.

The CellXpress.ai cell culture system can give your lab the confidence in experimental outcomes to make key decisions sooner, achieve milestones faster, and get to clinic earlier with lower attrition rates. All of it backed with the assurance of a full event log to confirm on-time feedings and critical task execution with complete digital microscopy records.

Key features



Automate your cell culture processes.

Total control over demanding feeding and passaging schedules reduces hands-on time in the lab.



Improve your screening workflows.

24/7 operation maximizes productivity for growing and scaling multiple stem cell lines, spheroids, or organoids.



Develop reliable, reproducible assays.

A machine learning-assisted solution standardizes the development process to deliver consistent, unbiased, and biologically relevant results at scale.

Key capabilities



- **Scale up complex cell culture workflows.**
Actionable imaging and turnkey protocols for reliable media exchange, monitoring, and passaging. Automated cell culture and image analysis workflows run 24/7 – even when your lab is closed.
- **Evaluate & make decisions earlier.**
Answer critical questions sooner easily identifying outliers at the well, plate, or experiment level to help detect variability sources. Save reagents by removing these plates or wells from downstream processing early in the drug discovery process.
- **Reduce human error.**
Improve productivity and optimize hands-on time with image-based, deep-learning decision-making. Remove variability, maintain sterility, and increase confidence in success with automated cell handling.
- **Track the complete cell journey over time.**
A unified software environment makes it easy to develop traceable and reproducible cell cultures specific to your desired assay endpoint.

- **Standardized protocols.**
Reliable and consistent automation speeds the development process. Real-time feedback alerts users to milestones or events and generates automated tasks to resolve them.
- **Turn data into decisions.**
Solve complex image analysis problems utilizing advanced artificial intelligence (AI) to transform images into results. User-friendly workflows help you get answers faster from 2D, 3D, and time lapse experiments.

HEPA filter helps **keep contaminants from entering the system**

Automated feeding to **reduce the need for human interaction.**

AI-assisted decision making for **reliable and reproducible samples**

Expansion port allows **additional instruments to be integrated for workflow flexibility**

Bulk and on-deck media to **support a variety of cell culture protocols**

Incubator offers different capacity options to **fit your workflow volume**

Integrated imager to **monitor your cell culture over time**

The workstation is a large, white, modular machine with a blue base. It has a top section with a HEPA filter, a middle section with an expansion port, and a bottom section with an incubator. A callout box on the right side points to a media reservoir. The machine has a control panel on the right side with a screen and buttons. The brand name 'Molecular Devices' and 'CellXpress.ai' are visible on the machine.

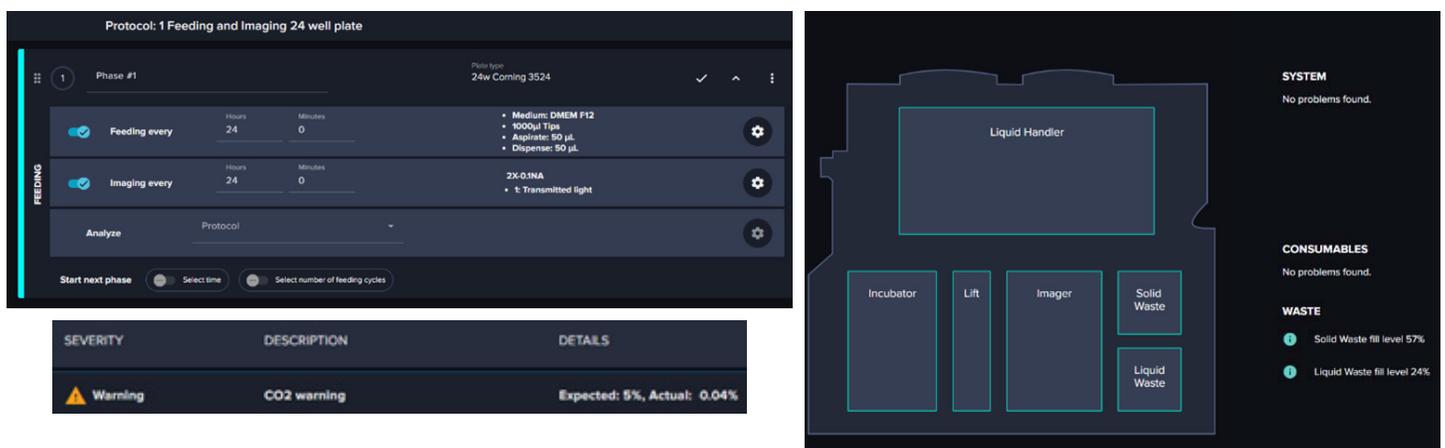
Complex biology simplified

An approachable, truly hands-off automated solution built by scientists, for scientists.

The CellXpress.ai cell culture system was designed with the biologist's point of view in mind. With the intuitive protocol wizard, users avoid complex scripting. Instead, you are able to build your workflows with an easy-to-use interface that follows the logical flow of the cell culture process.

The intuitive system dashboard gives you peace of mind to know that your culture run is operating as expected. A single software environment ensures that all the systems are operating at peak performance. No need to initialize individual instruments to ensure they are communicating with each other, simply walk up and use the system.

Error handling and reporting are integral to the system, so you can receive alerts should anything unexpected occur.

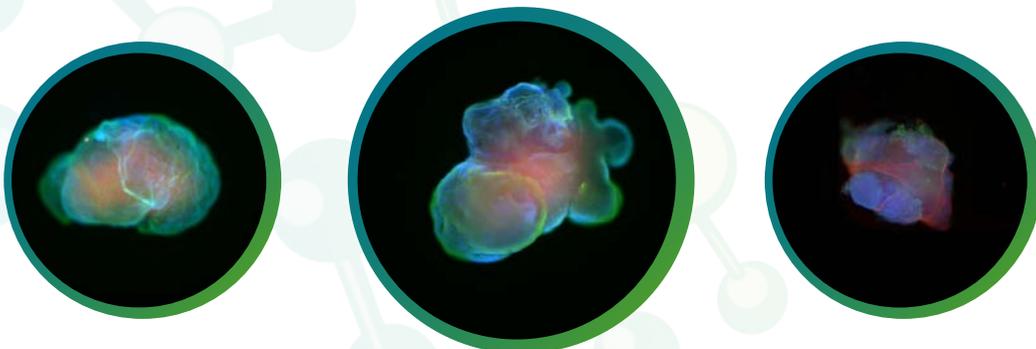


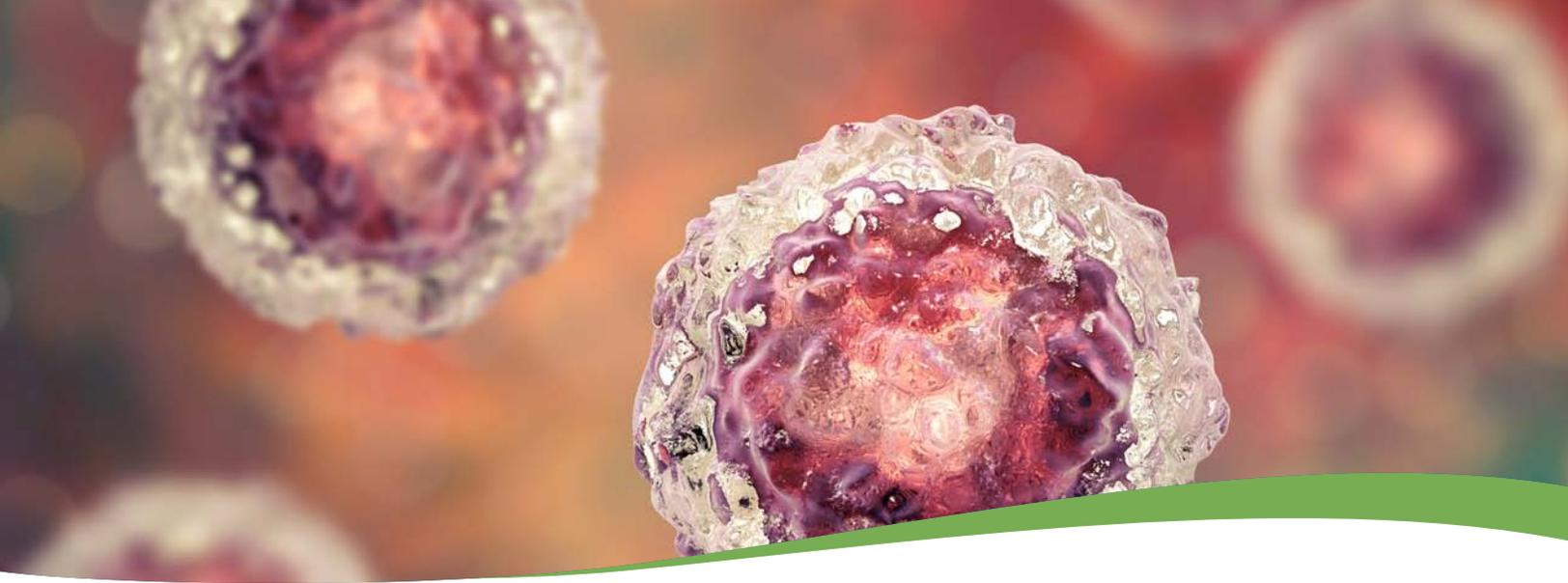
Screenshots from the CellXpress.ai cell culture system demonstrating unparalleled ease-of-use in protocol building. Status updates keep the users informed of critical events.

Relevant models

Access more biologically relevant models and ensure reproducibility—at scale

The CellXpress.ai cell culture system is a complete solution that standardizes the cell culture process—from maintenance, monitoring, and incubation, through imaging, analysis, and data processing—to deliver consistent, unbiased, and biologically-relevant results at scale.



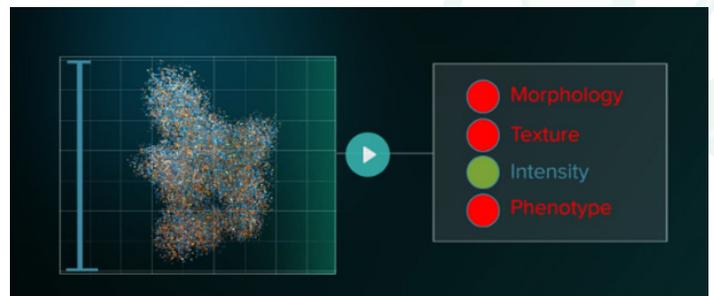
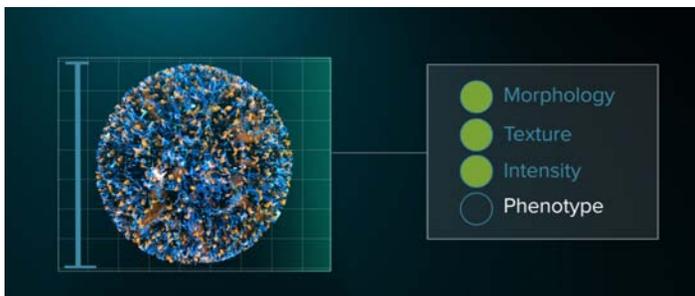


Reliable data

Unified software environment with data-driven visualization tools for traceable, reliable cell culture specific to your desired assay endpoint.

Track the cell journey downstream from the growth, expansion, differentiation, and maturation of complex models. With the CellXpress.ai cell culture system, you can visualize the parent/child relationship and trace any differences or variability back to the source. Achieve a new level of workflow traceability and replace ambiguity with data-driven science by recording what and when events occur in the cell culture process.

Built for 24/7 operation, you never have to worry about missing a feeding or passaging step. CellXpress.ai cell culture system provides workflow repeatability through automation and applies imaging-guided AI decision-making to ensure cell culture feeding and passaging events happen at the right time. In addition, event alerts keep you informed so you always know the status of your cell culture.



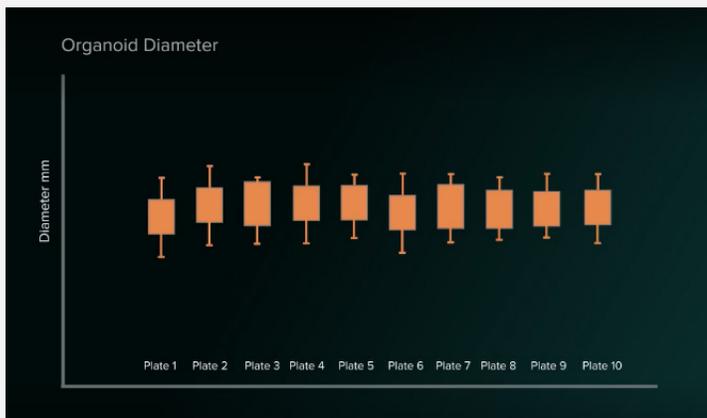
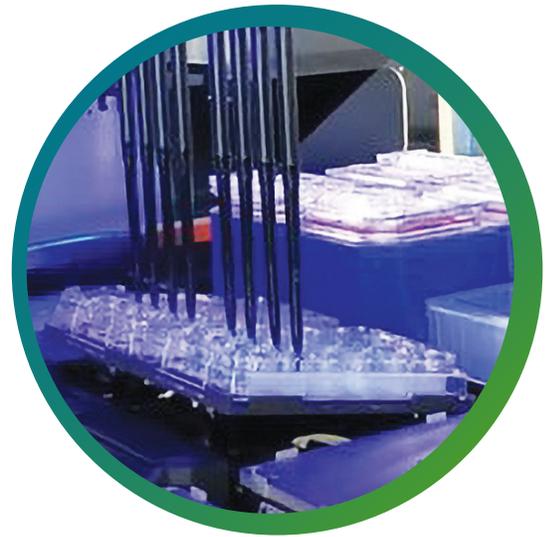
Machine learning-based decision-making allows users to distinguish between culture wells that are progressing as intended and those that aren't. User alerts based on error or results-based conditions keep you advised of your cell culture status.

Reproducible results

Powerful collaboration capabilities, leveraging built-in and custom protocols that can be easily executed, exported, and shared.

During protocol development, you get the flexibility of decision-making triggered by the operator or through the use of machine learning-powered algorithms. Researchers can then leverage these fully automated workflows to achieve reproducible results across multiple team sites.

- Flexible enough to support a multi-user environment with the ability to run several different protocols simultaneously and scalable to accommodate up to 100+ plates in an experiment.
- Whether starting from stem cells, patient-derived cells, or established cell lines, CellXpress.ai cell culture system can culture and differentiate into your organoid/spheroid model system with consistency and reproducibility for protocols supporting both bulk and low-volume media dispensing.
- From complete turnkey protocols to protocol sub-components, assembling a workflow for even the most complex model system is now easily attainable.



Widget-based GUI interface allows users to build their own experimental dashboard to visualize their results.



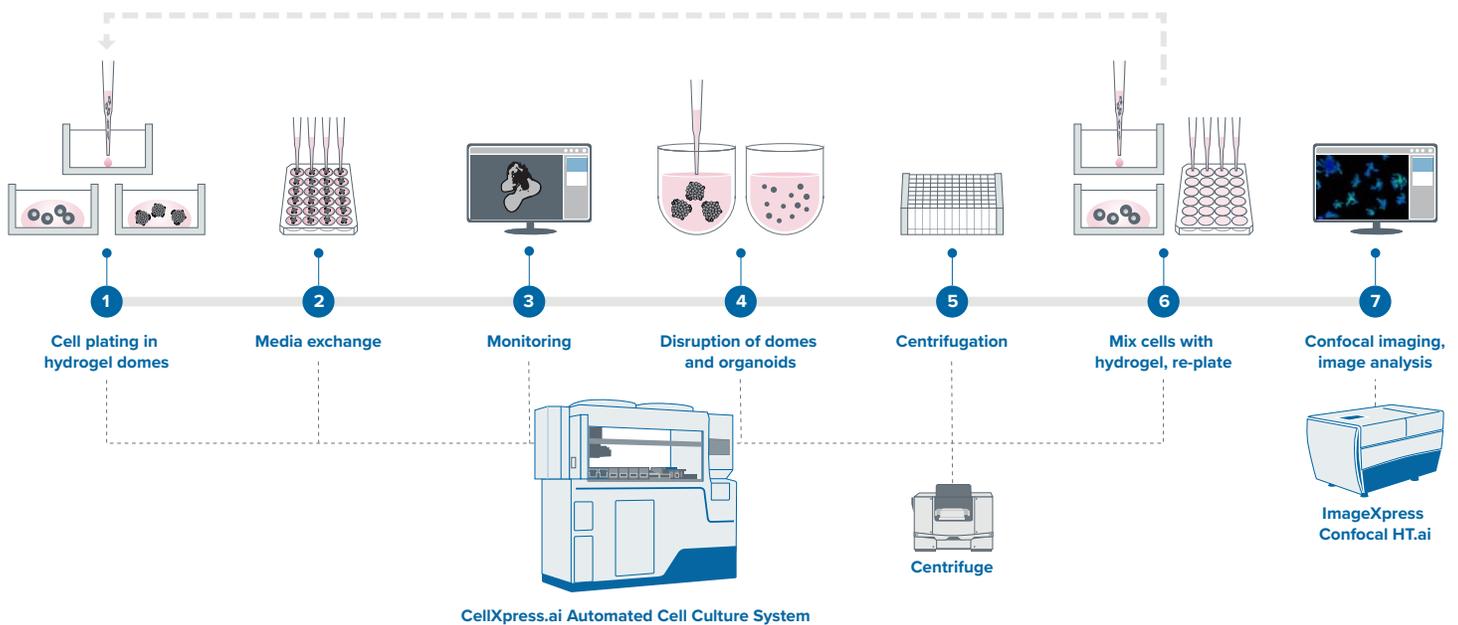
Consistent culture conditions and handling helps ensure reproducible results.

Example workflows

The CellXpress.ai cell culture system is intended to support a variety of model systems in both 2D and 3D and in both matrix and matrix-free environments. The following example workflows represent commonly used organoid culture protocols, including culture of 3D organoids in matrix domes or in the low attachment plates, and iPSC culture protocol.

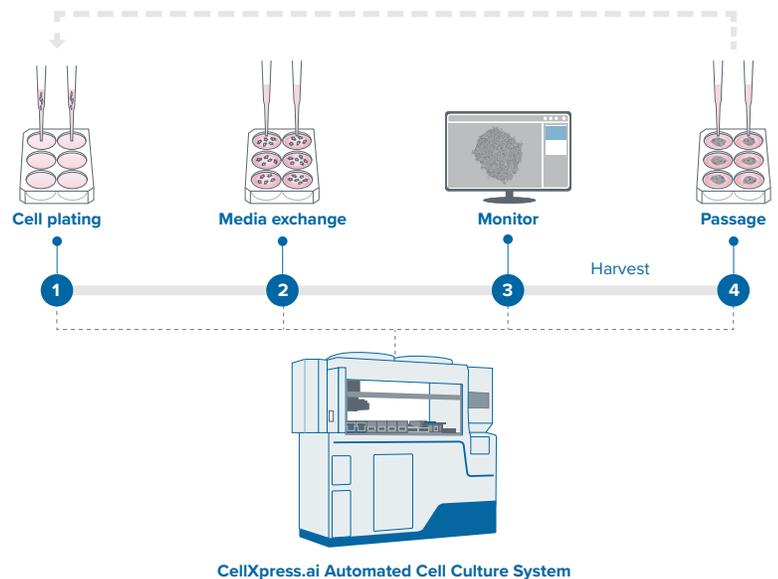
Intestinal workflow

The cell composition and arrangement of the epithelium make intestinal organoids useful for studying intestinal cell biology, regeneration, and differentiation, as well as disease phenotypes including effects of specific mutations, microbiome, or inflammation process.



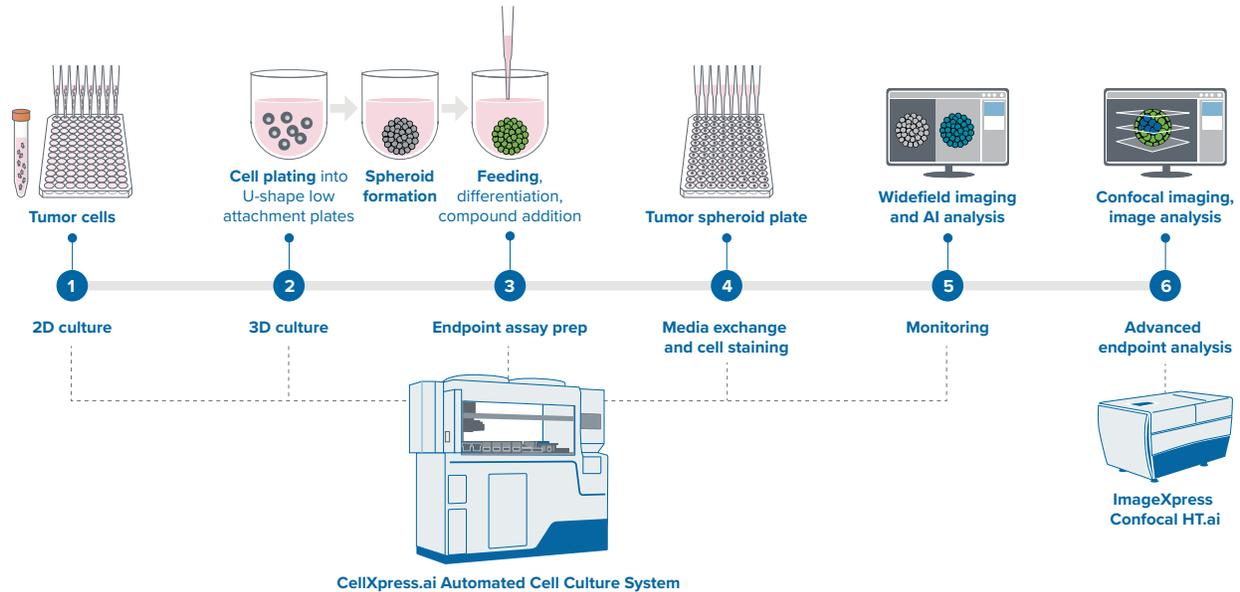
iPSC workflow

The workflows for assays involving stem cells are similar to other cell-based assays, but there are critical differences. Differentiation is often involved in stem cell assays because of the need to start with undifferentiated cells, or because the assay is studying the differentiation process. The CellXpress.ai cell culture system enables the maintenance and expansion of iPSC cell lines with media exchange and automated passaging triggered by imaging/morphology-based criteria, thus ensuring the consistent treatment of your iPSC cell culture.



Tumor spheroid workflow

One of the most significant objectives in cancer research is to understand tumor cell formation. Compared to 2D cell cultures, spheroids mimic solid tumors much more accurately. They help display the physiological changes that differentiate tumor cells from healthy cells. Multicellular tumor spheroid models give deeper insights into the tumor microenvironment, allowing researchers to visualize cell-to-cell interactions, how tumor cells absorb nutrients, and how they proliferate. The below example of a non-matrigel 3D protocol on cancer spheroids shows an automated workflow that includes plating, media exchange, staining, and imaging.



System features and options

Incubator

Capacity (choose)	44 plate max – 2 rack capacity 154 plate max – 7 rack capacity
Decontamination	Automated hydrogen peroxide decontamination
Environmental control	CO ₂ , temperature, and humidity control

Imager

Objectives	2X, 4X, 10X, 20X, 40X
Imaging modes	Transmitted light and up to 6 fluorescent channels
Acquisition mode	Time lapse, Z-stack, optional Digital Confocal*
LED light source	7 LEDs ranging from 365 to 730nm
Available filter cubes	DAPI, CFP, FITC, YFP, TRITC, TXRED, CY5, CY7
Environmental control	Temperature and CO ₂ control
Camera	24 megapixel Camera
Acquisition speed	Typical value of 3.5 mins per 96 well plate - 1 FOV, 1 channel

Liquid handler

Pipette head	Span 8
Deck locations	9 positions: plate cooling, heating, and tilting
Cell culture media	Heated and cooled positions for low-volume and bulk media
Decontamination	Automated on-deck UV decontamination

Waste

Liquid waste	10L liquid waste capacity with volume tracking
Solid waste	60L solid waste capacity with automated lid

System

Transfer ports	2 external plate transfer ports
Enclosure	HEPA filtered with anti-clog sensor
On-system display	15" touchscreen display
External workstation	10 Tb workstation with 27" LED monitor
Size	2250 mm W x 954 mm D x 2155 mm H
Weight	1,042 kg / 1,100 kg
Power consumption	2000W max, 2ea 10A lines
Certifications	CSA, CE

Software

Cell culture protocol manager	Pre-defined and user-defined protocols
Experiment manager	At-a-glance experiment manager
Cell journey	Phase-based cell journey with film-strip viewer
Decision making	Rule-based decision making to advance, stop cell culture
System dashboard	Intuitive dashboard informs the user of immediate or upcoming actions needed
User alerts	Configurable alerts keep the user informed about the state of the cell culture

*CellXpress.ai cell culture system uses AutoQuant 2D Real Time Deconvolution

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