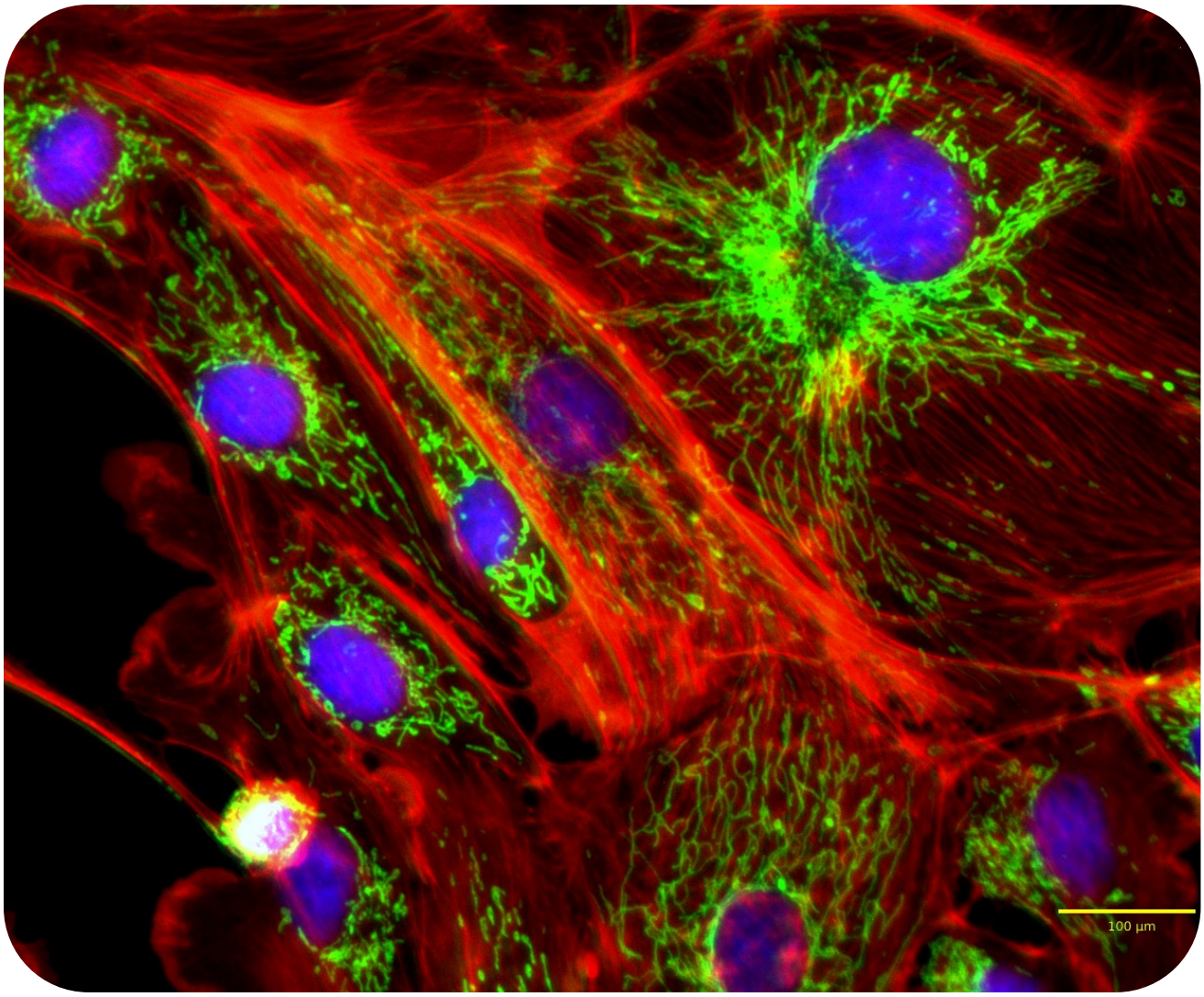

LATEST TECHNOLOGIES: DELIVER NEW INSIGHTS USING LIVE CELL IMAGING AND ANALYSIS

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NON-INVASIVE TRACKING FOR INDIVIDUAL CELLS

Within heterogeneous culture systems, important cellular events are often missed that, if detected, could give a whole new level of biological insight. For example, cell growth is more complex than just cells simply multiplying. They can increase in size without dividing, they can divide asymmetrically, they can grow to a certain size then stop. All these aspects of cell growth are lost with most live cell assays, particularly when using manual tracking and analysis methods.

Phasefocus™, Livecyte eliminates these constraints providing a more accurate and realistic account of treatment driven changes in cell behaviour. Using ptychographic quantitative phase imaging (QPI), Livecyte enables quantitative, label free, live cell imaging and analysis of single and multiple cell types in heterogeneous cell populations. Requiring only low-level illumination, Livecyte provides a non-invasive, gentle experimental environment, minimising interference and phototoxicity, making it suitable for more clinically and physiologically relevant primary, neural and stem cell populations, alongside traditional cell assays.

Livecyte easily produces high resolution, high contrast images from which individual cells can be readily defined and tracked for prolonged periods. The nature of the technique allows the areas of investigation larger than the field of view of the objective lens without the need for any image stitching, while also making it possible to automatically focus your sample post acquisition. This ensures that the microscope is not sensitive to focal drifts during a long-term time lapse, or differing focus positions across an entire well plate. Correlate changes in proliferation, motility and morphology, from every experiment.

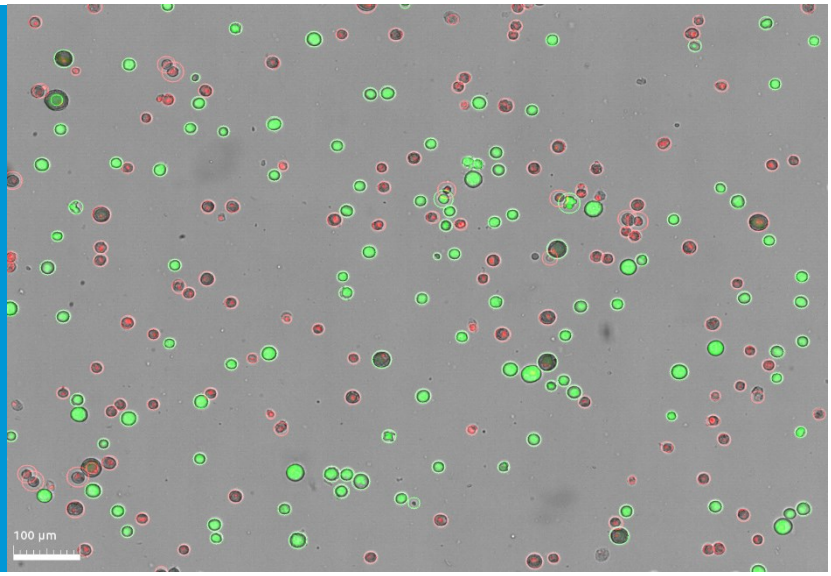
Phasefocus Livecyte:

- **High contrast time-lapse videos** using patented Ptychographic quantitative phase imaging (QPI) technology for label-free assays with or without up to **seven channels of complementary fluorescence.**
- **Automated single-cell tracking** of even the most sensitive cells quickly reveals subtle phenotypic differences in unperturbed cell populations.
- **Easy-to-use Dashboards** present coherent and concise results from up to 96 wells at a time whilst retaining the ability to investigate individual cell behaviour and outlying characteristics.

Livecyte answers questions that no other system can.

Phasefocus was awarded a Microscope Today Innovation Award in 2013 for the technology, and won a second award in 2017 for Livecyte itself. In 2018, researchers from Cornell University set the Guinness World Record for the highest resolution microscope using Ptychography on an Electron Microscope.

ACCURATELY MONITOR CELL CONCENTRATION AND VIABILITY



The biomanufacturing industry is experiencing rapid growth due to improvements in cell therapies, such as CAR-T cell therapy, and increasing bioactive production, which is expected to grow further over the next decade. In response to these demands, biomanufacturers have been expanding the production capacity while maintaining quality and regulatory compliance. The ability to monitor cell growth and health accurately while managing multiple cell batches is critical to ensure a more efficient workflow.

LUNA-FX7™ Automated Cell Counter provides the highest cell counting accuracy suitable for a variety of cell types. Users can analyse up to eight samples simultaneously by using the 8-channel slide, with a maximum counting volume of 5 µL in the single-channel slide (10 times that of conventional cell counters). Using brightfield and dual fluorescent detection, precision autofocus, advanced optics and a clever declustering algorithm, the LUNA-FX7 delivers reliable results for almost every cell type. Its broad cell detection range eliminates the need to dilute or concentrate samples, making the system ideal for diverse cell counting applications including single-cell sequencing and CAR-T cell therapy.

The Bioprocess option in the LUNA-FX7™ reduces unnecessary effort by automating the recording and analysing status indicators such as cell growth and viability, simultaneously for multiple cell culture batches using 3 different counting modes.

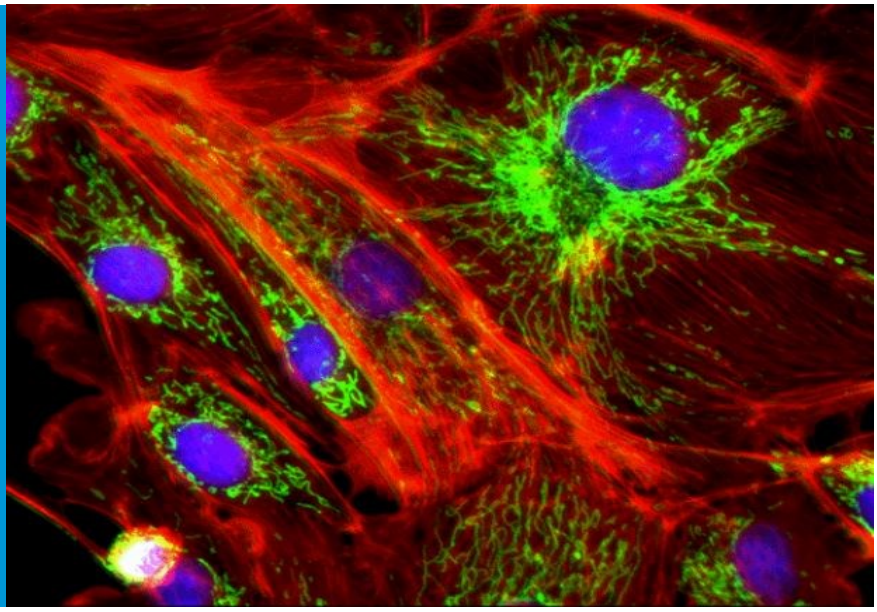
Automated calculations of doubling times, growth curves, and viability status provide information to monitor and forecast bioprocess production timelines reliably and accurately. When combined with the CountWire™ software package, the Bioprocess feature allows team members to monitor multiple culture batches in real-time across multiple facilities.

The LUNA family of automated counters has been awarded a **Platinum seal of quality from SelectScience** in recognition of outstanding feedback received from scientists globally – one of just 6 winners since the awards were launched in 2017!

LUNA FX-7:

- East-to-use, Accurate, High-speed cell counting
- Advanced optics and intelligent declustering algorithm
- High speed precision autofocus
- Multiple slide options (8-, 3-, 2-, 1-chamber formats)
- Data transfer via Wi-Fi, USB device, or Ethernet
- COUNTWIRE software compliant with 21CRF PART11/GMP requirements

HIGH CONTENT IMAGING AND ANALYSIS



Cytotoxicity assays are a crucial step in screening for and developing therapeutic drugs. Most assays designed to measure cytotoxicity in vitro evaluate cell membrane integrity or metabolic activity after exposure, but are typically based on studying a single time point and require disturbing the growth of cells in culture.

Cell confluency is the proportion of a surface covered by adherent cells and is an indication of cell growth and density. The traditional way to measure cell confluency is to estimate cell confluency by the human eye and using a light microscope. This carries several problems, as total cell count estimates are entirely subjective and can vary greatly for the same cell culture at the same (objective) confluency depending on external factors.

The CELENA X High Content Imaging System combines automated, digital brightfield imaging with high content analysis to provide quantitative readouts for assessing and comparing confluency changes over time. This automated, non-destructive method uses brightfield imaging, which avoids the use of fluorescent stains that can have toxic effects in and of themselves over long incubation times. The onstage incubator allows users to quickly and easily set up high-content imaging experiments to measure phenotypes of interest objectively, quantitatively and reproducibly within a precisely controlled environment.
With four-channel fluorescence, brightfield, colour brightfield, and phase contrast imaging modes, together with laser autofocusing and motorised positioning of the XYZ stage, the CELENA X ensures rapid, reproducible and clear images every time. The intuitive user interface makes creating imaging protocols accessible to all users from novice to experienced.

CELENA-X:

- Fully automated plate and slide imaging
- Laser autofocus
- Fluorescence imaging in four channels, bridhtfield, colour brightfield, and phase contrast imaging
- Powerful, easy-to-use user interface and data analysis software
- Customisable high content analysis

The CELENA X is as flexible as it is powerful, with interchangeable objectives and filter cubes to accommodate a wide range of fixed and live cell imaging applications.

RAPID AND EFFICIENT WHOLE TISSUE CLEARING

Tissue clearing techniques have allowed biologists to acquire high-resolution volumetric images without the need to reduce samples to thin serial sections. One major limitation to some techniques is preserving the signal from endogenous fluorescent proteins (FPs). Although recent solvent-based techniques have attempted to address this issue, these methods still can only maintain FP emission for a few days, can require a significant time investment and are limited to small tissue samples.

The X-CLARITY system and reagents for tissue clearing are based on the CLARITY principle and have been developed to standardise, simplify, and accelerate each step of the tissue clearing process. The electrophoretic tissue clearing (ETC) chamber with platinum-plated electrodes and built-in cooling system ensures efficient tissue clearing of large samples at single-cell resolution, without degradation of fluorescent probes due to heat.

X-CLARITY allows a whole mouse brain to clear in just 6 hours while also preserving endogenous FP signals. Applications for the X-Clarity method extend beyond brains, virtually any organ can be cleared, even organoids.

Transparent samples can be labelled using the DeepLabel Antibody Staining Kit, which enhances antibody penetration deep into clarified tissues. A refractive index matching solution (RIMS), reduces light scatter, which in turn increases optical transparency and consequently increases image quality and imaging depth.

X-CLARITY Tissue Clearing System components:

- **Polymeriser,** Sets the infused hydrogel – bolstering the tissue structural components.
- **Electrophoretic Tissue Clearing (ETC) chamber,** Lipids are extracted actively through electrophoresis or passively, leaving behind a stable and transparent tissue-hydrogel hybrid that is chemically accessible for molecular phenotyping.
- **Control Tower** with built-in cooling system for efficient tissue clearing.

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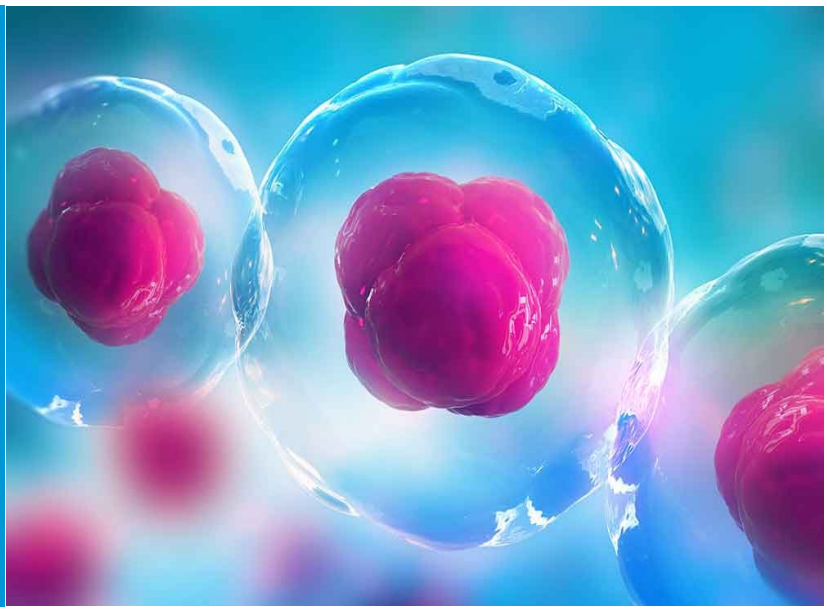
SAFE AND RELIABLE LIVE CELL TRANSPORT



Transporting living complex cells while retaining their full viability and functionality can be challenging. Traditionally, cells and other biological material have been stored and transported at low to cryogenic temperatures. During this process, cells often suffer from exposure to sub-optimal life-sustaining conditions (e.g. temperature, pH, etc) as well as damage due to shear stress and cryoprotectants. Not only does cell viability need to be considered, but inadequate cryopreservation may introduce variations between different batches or could even cause genetic and epigenetic modifications.

Cellbox is the first portable CO2 incubator that enables safe shipping of intact cell/tissue constructs from one facility to another that overcomes these obstacles. Ideal for air and ground transport, Cellbox provides a regulated CO2 environment and can maintain temperatures between 28 and 37° C while also monitoring the health of cells via the Cellbox App.

Specially developed for the transport of sensitive cells and cell cultures, the Cellbox is ideal for:

- iPSC's and iPSC-derived cells, such as sensory neurons, microglia and cardiomyocytes.

Cells can be transported under laboratory conditions, in the Cellbox while avoiding unwanted changes in metabolism, gene expression and protein profiles.

- Long-term cell storage and biobanks can benefit from receiving fresh material and performing the cryopreservation in-house. Recipients can benefit from the Cellbox by receiving thawed and recovered cells from a biobank, ready-to-use.
- Lab-on-a-Chip or Tissue-on-a-Chip products can be seeded with living cells before shipping under laboratory conditions in the Cellbox.

CELLBOX Live cell shipper

- **Portable CO2 Incubator** for convenient transport of cells by car, train, ship or as air cargo
- **Maintains temperature** between 28-38°C
- Provides **regulated CO2 environment**
- **Rechargeable, Li-ION battery** with external 100 – 230V power supply
- **Versatile,** suitable for multi-well plates, T-Flasks, Tubes and other CO2 permeable cell culture vessels
- Data logging and export via **Cellbox App**

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