

PHC Europe:

# Pioneering Innovations in Cell-based R&D process

PHC Europe, renowned for its evergreen product lines of refrigerators, freezers, and cell culture incubators, is expanding its innovation portfolio with a novel product line supporting research and development in the Cell & Gene Therapy (CGT) field and Cell-based R&D.



The flagship product of PHCbi's CGT line is the Live Cell Metabolic Analyzer (LiCellMo), an innovation that enables long-term, continuous, manual sampling-free measurement of glucose and lactate in natural cell culture environments. LiCellMo visualizes real-time changes in glycolysis-based cellular metabolism, providing precise information about in vitro metabolism shifts and cellular statuses.

At the heart of LiCellMo is PHCbi's proprietary sensor technology, developed in-house by PHC's engineering team in Japan. This electrochemical sensor, where glucose dehydrogenase and lactate dehydrogenase are conjugated, detects and records mild currents released during dehydrogenation reactions in the cell culture medium. To date, eight patents covering the sensing technology, its manufacturing, and the LiCellMo system have been issued in various countries, highlighting its uniqueness and originality.

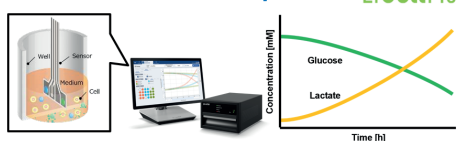
LiCellMo's real-time measurement of glucose and lactate can sustain up to 10 days without

manual sampling, creating a labor-free working environment for researchers and scientists, thereby increasing R&D efficiency. Measurements are taken once per minute, with data smoothed and output every 15 minutes. Additionally, the metabolic rate based on glucose and lactate is calculated automatically. Furthermore, the LiCellMo system is housed in a standard CO2 incubator, ensuring cells remain in their natural growth environment and can be used for further experiments, evaluations, or cell expansion after metabolic data collection.

LiCellMo is a versatile tool for monitoring:

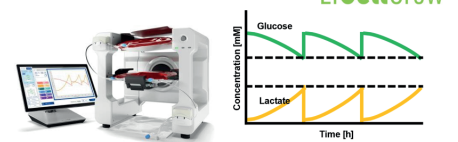
1. Shifts in metabolism pathways (glycolysis VS mitochondrial respiration)
2. Long-term changes in cellular statuses
3. Cell differentiation and activation

## Live Cell Metabolic Analyzer



- Monitoring glucose & lactate continuously
- Usual culture environment
- Evaluating glycolysis directly

## Bioreactor



- Monitoring glucose & lactate continuously
- Closed culture system
- Controlling based on measuring data

Its applications span various fields, including but not limited to metabolism-related research (e.g., diabetes, liver, cardiovascular), oncology and tumor microenvironment studies, immunology, primary cell and stem cell cultivation and differentiation, cell culture medium optimization and testing, process development (e.g., upscaling to bioreactors,

pharmaceutical component screening, and mode of action determination), and sports medicine.

Building on this, PHCbi's engineering team has developed LiCellGrow, an automatic bioreactor controlled via the real-time glucose and lactate measurements mediated by the same sensing technology as LiCellMo. LiCellGrow offers various approaches to control the bioreactor system, such as via the threshold value or the range value of the glucose and lactate measurement, and when necessary replacing the old cell culture medium with the new one. It also allows users to monitor cell conditions based on four critical elements: glucose, lactate, pH, and oxygen concentration.

PHCbi's new CGT product line, grounded in proprietary technology, is poised to provide biomedical scientists with a paradigm-shifting solution for monitoring cell statuses and controlling cell culture growth. While LiCellMo is currently available, LiCellGrow is scheduled for launch in October 2025. We look forward to collaborating with academic and industry partners dedicated to biomedical research and development, with LiCellMo and LiCellGrow efficiently supporting your efforts to advance innovation.

Connect with us for an in-depth discussion and a demo on location:

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<https://www.phchd.com/eu/biomedical/cell-analysis/live-cell-metabolic-analyzer/licellmo>