PHCbi

Life Science
Innovator
Since 1966

LIVE CELL METABOLIC PATHWAY ANALYZER

LiCellMo®

Visualize real-time changes in cell metabolism. Continuous measurement of glucose and lactate in culture medium without manual sampling.

PHC Corporation of North America

www.phchd.com/us/biomedical

Understanding Cell Metabolism

Understanding the metabolic activity of cells is crucial for advancing our knowledge of cell biology. This understanding is vital for a wide range of research areas, including cancer immunotherapy (such as CAR-T cell therapy) and regenerative medicine using stem cells. In the production of cell therapy products, obtaining high-quality data on glucose uptake and lactate production is essential for optimizing metabolic activity. This optimization leads to more efficient manufacturing processes, resulting in higher yields and improved product properties.

The benefits of continuous monitoring over periodic sampling methods

Glycolysis is a key pathway in cellular energy metabolism, involving the uptake of glucose by cells and the production of lactate. Traditionally, analyzing cellular metabolism required point data for glucose and lactate concentrations, obtained from a few samples taken throughout the day. This method provided only limited snapshots of the metabolic state of cells.

LiCellMo revolutionizes this process by continuously analyzing cell metabolism, providing real-time, minute-by-minute visualization of cellular states. Its unique high-precision in-line sensors enable measurement of glucose uptake and lactate production in the culture medium, reflecting the growth and differentiation of cells. Since cell activity can be monitored without manually sampling the medium, the same cells can be used for further evaluation after the assay. This innovative approach offers new opportunities to overcome existing obstacles in metabolic research and achieve groundbreaking discoveries.

Reduce Stress on Cells

LiCellMo allows you to keep cultures in their preferred culture environment providing optimal culturing conditions and reducing cell stress.

Preserve Cell Samples

LiCellMo does not require addition of dyes or reagents to cell cultures, allowing researchers to preserve cells for further evaluation after measurement.

Reduce Chances of Contamination

LiCellMo reduces the number of times samples are handled, so the cell culture remains undisturbed during experimentation and minimizing contamination risk.

Capture Real-Time Metabolic Data

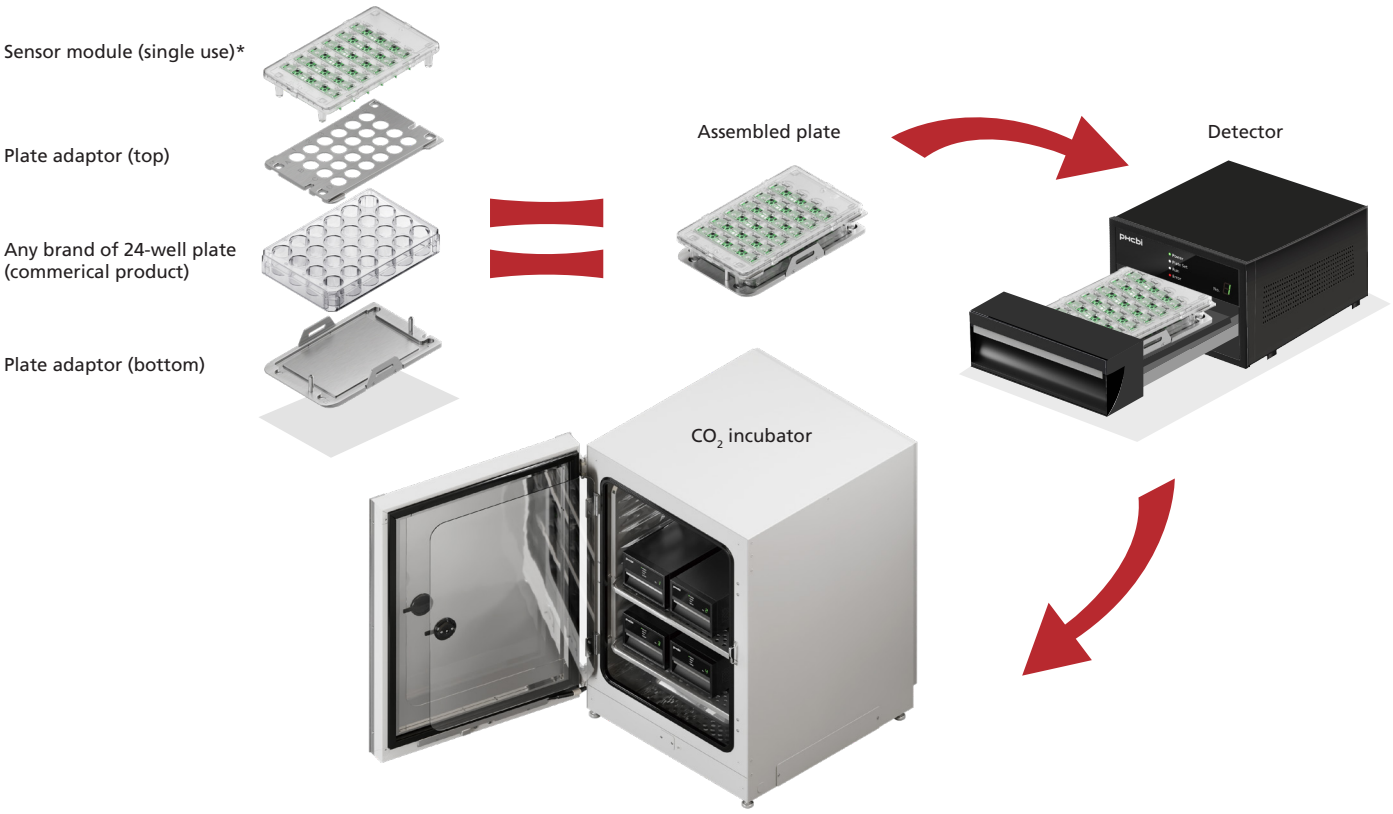
LiCellMo offers uninterrupted, real-time insights into glucose and lactate metabolism, providing minute-by-minute data on metabolic pathways.

Save Time

LiCellMo does not require a researcher on-call after set up as metabolic data will be collected continuously without manual sampling.

How can you continuously monitor cell metabolism?

Before using, insert the detector into the CO_2 incubator. Attach the sensor module and plate adapter to a standard 24-well plate. Once the plate is placed in the detector, you can easily check real-time measurements using the touch-panel controller. This straightforward setup is adaptable for many kinds of laboratory spaces. Plate adapters (compatible with five different commercial 24-well plates) are available for purchase separately without any specific culture media requirements, allowing users to use their preferred equipment and reagents.



* sensor module has a shelf life of 8 months

Continuous monitoring can benefit reasearch like:

Regenerative medicine research: metabolic analysis can help ensure that developing organoids better simulate *in-vivo* metabolic activity.

Disease modeling: metabolic analysis of specially designed cell cultures can provide insight into the metabolic perturbations associated with diseases.

Therapeutic development: metabolic analysis of cell cultures can indicate how they respond to the administration of therapeutic candidates.

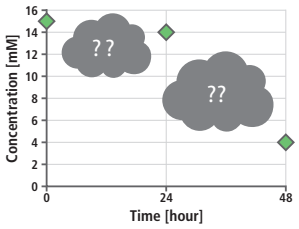
Insights into cellular processes: metabolic analysis can reveal the differentiation state of cells.

About PHC's in-line monitoring technology

The in-line monitoring technology used in LiCellMo builds on the core technology of the blood glucose sensor developed by PHC's diabetes management business which provides high-quality blood glucose monitoring (BGM) systems globally to meet the diverse needs of people living with diabetes mellitus. LiCellMo combines BGM sensor technology with in-line monitoring technology to measure glycolysis as one of the cellular metabolic pathways.

Conventional method

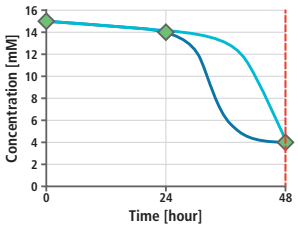
Sampling data



Changes between samplings cannot be seen with point data

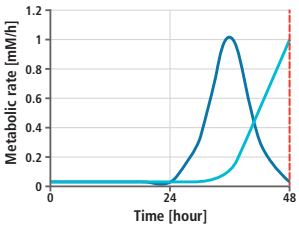
LiCellMo live cell metabolic pathway analyzer

Continuous concentration measurement data



Line data from in-line monitoring

Data on rate of change of concentration



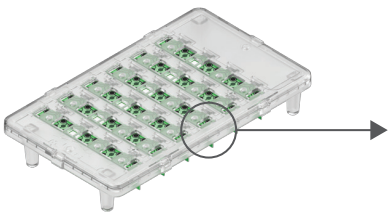
Monitoring from continuous changes in concentration using rate of change as an indicator

LiCellMo helps you visualize the changes between sampling

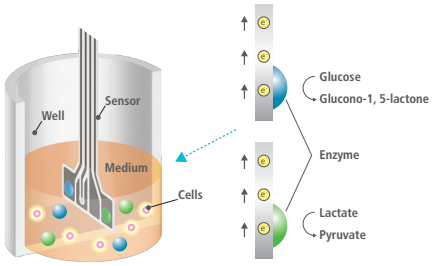
What are electrochemical sensors?

These sensors use electrical changes arising from chemical reactions. The concentration of the analyte is converted into an electrical signal through enzymatic redox reactions and then quantified. The electrochemical in-line sensors used in the LiCellMo carry enzymes that bind specifically to glucose and lactate.

Sensor module



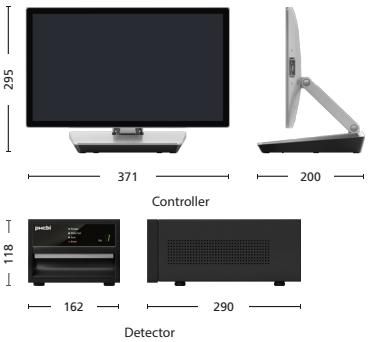
Immersion point of in-line electrochemical sensors in well plate



Specifications

Product Summary	Items monitored	Glucose, lactate (simultaneous continuous measurement of both items)	Controller	External dimensions	Width 371 mm × Depth 200 mm × Height 295 mm
	Main device components	Controller, Detector, Plate adapter (optional product)		Weight	2.5 kg (excluding accessories)
	Main consumables	Sensor module (single use)		Screen	15.6-inch-wide touch panel display
	Compatible plates	24-well plate *Compatible with 5 commercial products		Extendability	Wired connectivity for up to 4 detectors
	Monitoring duration	Maximum 10 days	Detector	External dimensions	Width 162 mm × Depth 290 mm × Height 118 mm
	Measurement range	Glucose: 1–27 mM (0.18–4.86 g/L)		Weight	4.7 kg
		Lactate: 1.5–15 mM (0.14–1.35 g/L)		Installation	Inside CO_2 incubator
				Number of units installable in PHCbi incubators*	MCO-50 series: Max. 1 unit
					MCO-170 series, MCO-171AICD series, MCO-230 series: Max. 4 units (2 units × 2 shelves)

*If installing two detectors on one shelf, use a dedicated reinforced tray (MCO-170RT-PW / MCO-230RT-PW).



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