

BioLector® I

48 Parallel Microbioreactors



High-Throughput
Real-Time Monitoring
Scalability
Automation



High Information Content for fast Selection BioLector® I

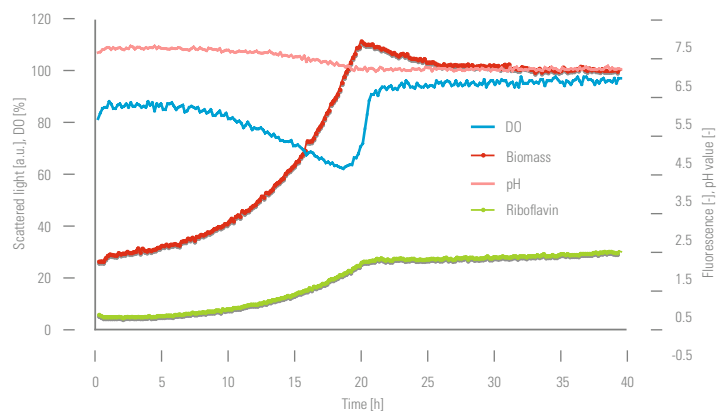
The BioLector® I is the first bench top microfermentation system to perform high-throughput fermentations together with online monitoring of the most common fermentation parameters (biomass, pH, DO and fluorescent molecules).

The system is based on a standard microtiter plate format and operates with non-invasive, optical sensors. Due to the continuous and rigorous shaking during the optical measurements and over the whole experimental time it is ideally suited for aerobic and anaerobic cultures. For the first time, real time culture monitoring at a massive parallel scale becomes possible!

Applications

- Cell line and strain screening
- Media screening and optimization
- Fermentation parameter optimization
- Anaerobic and microaerophilic fermentations
- Synthetic and systems biology
- Statistical design of experiments (DoE)
- Growth characterization
- Protein building kinetics
- High-throughput protein expression
- Enzyme and cell activity tests
- Functional genomics
- Proteomic studies
- Inhibition and toxicity tests
- Quality control

Measurements



Multiparameter-Monitoring in the FlowerPlate®
48 well FlowerPlate®, 1000 µL, 800 rpm, 37 °C

48 Parallel Microbioreactors



Features

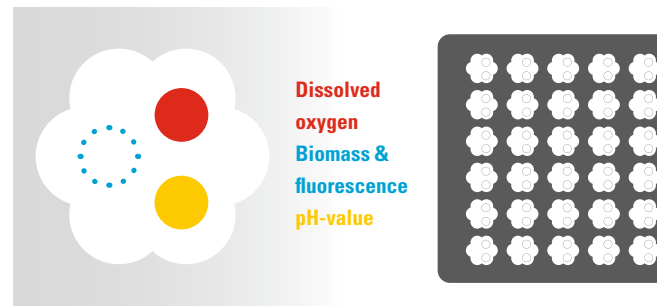
Online Parameters

- Biomass concentration
- pH-value
- Dissolved oxygen (DO)
- NAD(P)H and riboflavins
- Fluorescent molecules (GFP, YFP, DsRed ...)

System Performance

- Working volume of 800 – 2400 μL
- 48 parallel microreactions
- No foaming problems
- Broad range of $k_L a$ values (25 – 600 1/h)
- Continuous gas exchange and oxygen supply
- Equal power input to each reactor
- Defined engineering parameters and scalability
- Controlled gas atmosphere (CO_2 , O_2 and N_2)
- Humidity control (> 75 % rH)
- Temperature control (20 – 50 $^\circ\text{C}$)

Operating Principle



Multiparameter FlowerPlate® with Optodes

Smaller and Smarter

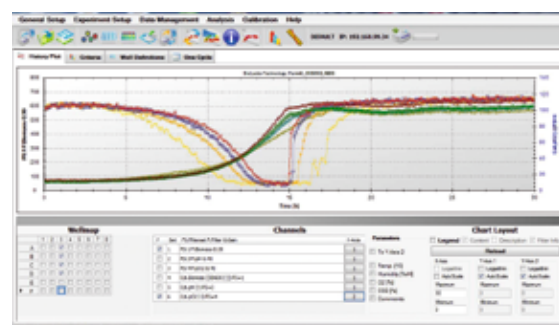


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Advantages

- Real time kinetics out of 48 parallel fermentations
- Microfermentation in standard MTP format
- High-throughput and easy automation
- Broad linear range for biomass (up to 100 g/L CDW, 600 OD)
- Excellent reproducibility (CV < 5 %)
- No edge effects
- Continuous shaking operation (no artifacts)
- Defined mass transfer conditions (no O₂-limitation)
- Easy scale up to lab-fermenters
- Industry leading data analysis software
- Fast and easy data analysis included
- A valuable tool for PAT and QbD

Intelligent Software



Data Analysis with the BioLector Software

Technical Specifications

BioLector® I

SYSTEM

Art.-No. G-BL-100

Operation conditions		Optical measurements	
Plate format	48	Filter configuration	up to 6 different filters
Volume	800 – 2400 µL (depending on microtiter plate)	Wavelengths	365 nm – 800 nm
Temperature	5 °C below room temperature, max. 50 °C	MTP read time	down to 3 min/parameter/48 wells
Gas atmosphere	Only air (optional modules, see below)	Linear range of cell counts	0.2 – 600 OD (0.1 – 100g/L CDW)
Humidity	> 75 % rH		
Orbital shaker	400 – 1500 rpm at 3 mm (diameter)		
Modules		pH / DO Monitoring	
Dimensions (W×H×D)	795 mm × 333 mm × 470 mm	Calibration	Precalibrated plates
Weight	Approx. 40 kg	Measurement range pH	3.0 – 6.0 or 4.5 – 7.5 depending on plate type
Power source	100 – 240 V (50/60 HZ)	Measurement range DO	0 – 100 % oxygen saturation
Interface	Ethernet	Application mode	Disposable technology
Ambient conditions	15 – 40 °C, max. 75 % rH		
Automation	Optionally, the BioLector® can be integrated into the RoboLector® liquid handling systems*		

OPTIONAL MODULES

Art.-No.	Module description	Application	Additional feature	Note
E-AN-200	BL-Module for anaerobic cultivation	Strict anaerobic fermentation + small, controlled gas flow	Gassing with pure N ₂ or CO ₂ or other defined gases, controlled gas flow through mass flow controller (1 – 10 mL/min)	
E-O2-100	O ₂ -upregulation module	Fermentation with O ₂ enriched air	Control of gas atmosphere: 21 – 35 % O ₂	Only one O ₂ sensor can be installed in the device
E-O2-25	O ₂ -downregulation module	Fermentation at O ₂ reduced air, microaerophilic conditions	Control of gas atmosphere: 2 – 21 % O ₂	Only one O ₂ sensor can be installed in the device
E-CO2-10	CO ₂ -upregulation module	Fermentation with CO ₂ controlled gas atmosphere	Control of gas atmosphere: 0 – 10 % CO ₂	
E-AN-201	BL-Preparation: anaerobic cultivation	Preparation for later addition of anaerobic module		Easy integration of anaerobic module on site
E-AN-202	Anaerobic cultivation set	Later addition of: Strict anaerobic fermentation + small, controlled gas flow	Gassing with pure N ₂ or CO ₂ or other defined gases	Anaerobic module for integration on site
E-FRET-100	BL-Option for FRET measurement	FRET measurements in BioLector® (1× excitation / 2× emission fluorescences)	Additional measurement of a second, synchronous emission wavelength	Two photomultipliers installed
E-OP-101-199	LED/Filter Module	Measurement of additional fluorescences in the BioLector®	Measurement at additional wavelengths	Ask your sales manager for available modules
E-OP-900	Notebook for BioLector® System	Notebook for data analysis	Data analysis and visualization on a separate computer	

It is possible to combine all types of modules (AN, O₂, CO₂, FRET) in one device.

ORDERING

Leasing option available

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The Company

m2p-labs is a worldwide leading supplier of microbioreactors.

The company focuses on microreaction and automated solutions for screening and bioprocess development. The microfermentation technology enables customers to conduct experiments with greater efficiency, better quality and lower cost than in any other cultivation platform. More knowledge from small scale leads to more rational and reliable decisions in the development of bioprocesses.



PRODUCT PORTFOLIO

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Systems

The BioLector® microbioreactor is a unique high-throughput fermentation system. In up to 48 parallel cultures the essential fermentation parameters such as biomass concentration, pH and DO as well as fluorescent proteins or substrates can be all monitored online. The advanced BioLector® Pro technology is using proprietary microtiter plates with an integrated microfluidic chip. By using the microfluidic technology the system continuously controls the pH of each culture individually as well as the feeding for fed-batch cultivations. The BioLector® microbioreactors are established systems for bacterial, yeast, fungi, plant and insect cells. All systems are suitable for aerobic, microaerophilic and strict anaerobic cultivations.

Disposables

m2p-labs provides worldwide unique microtiter plates with improved oxygen transfer and excellent mixing properties. Due to its design, the FlowerPlate® supplies microbial cultures even with high oxygen demands with a sufficient amount of oxygen. In addition, the proprietary microfluidic plate uses 16 donor wells for online feeding and pH control. The round well plate delivers moderate oxygen transfer for organisms with lower demand in oxygen or organisms sensitive to shear stress. All plates are available with different optical sensors for different applications.

Automation

The RoboLector® provides an unique automated cultivation platform combining the high-throughput fermentation and the online monitoring capability of the BioLector® with the very accurate and reproducible pipetting of a liquid handling robot. The system is used for media preparations, automated sampling and dosing steps, inductions and fed-batch processing.

www.m2p-labs.com