RoboLector®
Automated Fermentation

High-Throughput
Real-Time Monitoring
Scalability
Automation

The Robotic Solution for your Fermentation
RoboLector®

**The RoboLector® is a proprietary combination of a liquid handling robot and a BioLector®.**
This unique automated fermentation platform integrates the high-throughput fermentation and online monitoring capability of the BioLector® with the precise and accurate liquid handling of a robotic system. Automated fermentations with the RoboLector® allow far more elaborate and complex experiments in the lab than ever before. The platform autonomously prepares media compositions, e. g. from design of experiments (DoE) templates. During the online-monitored high throughput fermentations inducers and feed solutions can be added as well as the pH value adjusted. Each process is triggered and monitored for each well individually, either according to a predefined schedule or by online process signals. Automated sampling into various targets, including a cooling station, facilitates optimal process monitoring and control.

Applications

- Automated sampling
- Automated induction
- Induction profiling
- Synchronized process manipulation
- pH profiling
- Feeding profiling
- Media preparation
- Triggered process manipulation
- Process characterization
- High-throughput protein expression
- Automated upstream processing with microbial cultures

Measurements

Triggered controlled sampling
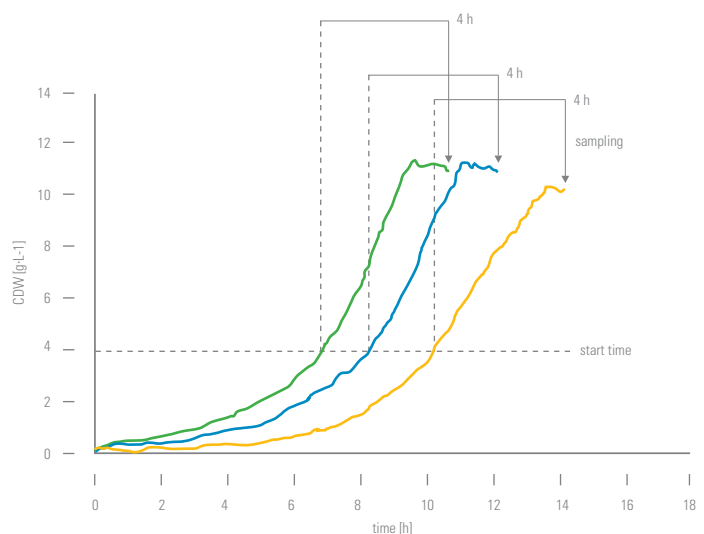
C. glutamicum ATCC 13032 pXMJ 19: SP-Cutinase T=30 °C, 1200 rpm, 3mm, 1 mL media: CG XII, 0.5 mM IPTG

Source: Rohe et al. Microbial Cell Factories 2012, 11:144

Full Process Understanding


Features

Fermentation Modes

- DO or time controlled feeding
- Fed-batch with bolus feeding
- Repeated fed-batch

- Biomass dependent sampling or dosing
- Time dependent sampling or dosing
- pH adjustments

Online Trigger Signals

- Biomass concentration
- pH, DO (using optodes)
- Fluorescent molecules (GFP, YFP, DsRed ...)
- NAD(P)H and riboflavins
- Process or induction time
- Working volume

Operating Principle
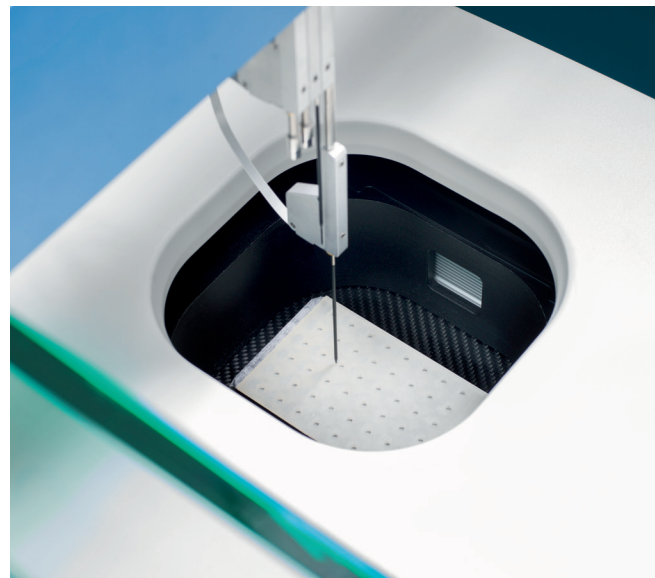
Access of pipetting tips to the shaking microtiter plate in the BioLector®

Precision in Fermentations

RoboLector® | m2p-labs

Advantages

- Automated upstream processing of up to 48 parallel fermentations
- Continuous operation 24 hours/day and 7 days/week
- Plug & Play disposable technology
- Design of experiments (DoE)
- Detailed process understanding in short time
- Excellent pipetting accuracy (< 5 %, 50-950 µl) and reproducibility (CV < 5 %, 50-950 µl)
- Reliable scale up to lab-fermenters
- Fast and easy data analysis
- A valuable tool for PAT and QbD
- Processing units possible (for custom made solutions[1])

Watch the video: www.m2p-labs.com/news-media/videos/

Process Design Software
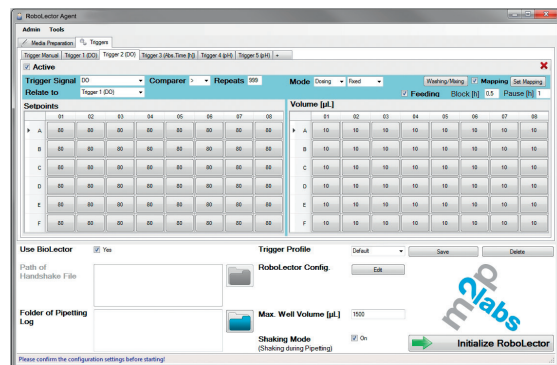
RoboLector® Agent Software for Fermentation Process Design

Technical Specifications
RoboLector®

	RoboLector® L	RoboLector® XL
	Art.-No. G-RL-200/400	Art.-No. G-RL-800
	BioLector® integrated	BioLector® integrated
Operation Conditions BioLector®		
Plate format	48	48
Working volume	800 – 2400 µL	800 – 2400 µL
Temperature, minimum	5 °C below RT (room temperature)	5 °C below RT (room temperature)
Temperature, maximum	50 °C	50 °C
Gas atmosphere	Various, see BioLector®	Various, see BioLector®
Humidity	> 75 % rH	> 75 % rH
Orbital shaker	400 – 1500 rpm at 3 mm (diameter)	400 – 1500 rpm at 3 mm (diameter)
Liquid Handler		
Robotic arms	1	1
Arm type	Liquid handling	Liquid handling
Pipetting channels	2 or 4	8
Pipetting volume		
with disposable tips	20 – 950 µl	20 – 950 µl
with washable tips	10 – 1000 µl	10 – 1000 µl
Liquid level detection	By capacity in conductive liquids	By capacity in conductive liquids
Type of tips	1 disposable tip, 1 washable tip (L-2)	2 disposable tips, 6 washable tips (XL-8)
	1 disposable tip, 3 washable tips (L-4)	
Max. deck positions (SBS footprint)	16	20
Modules		
Dimensions (WxHxD) w. BL I	1625 × 935 × 780 mm	1850 × 935 × 780 mm
Dimensions (WxHxD) w. BL Pro	1830 × 935 × 780 mm	2055 × 935 × 780 mm
Weight (excl. BioLector®)	ca. 84 kg	ca. 102 kg
Power source	100 – 240 V (50/60 Hz)	100 – 240 V (50/60 Hz)
Optional modules	Different racks for reaction tubes, MTP (96, 48) cooling station, magnetic stirrer	Different racks for reaction tubes, MTP (96, 48) cooling station, magnetic stirrer
Software Features		
Media preparation (disposable tips)	✓	✓
DoE import	✓	✓
Signal triggered actions	✓	✓
Dependent trigger	✓	✓
DO-controlled feeding	✓	✓

The RoboLector® is a proprietary combination of a liquid handling robot and the BioLector®.

[1] Optionally, the BioLector® can be integrated into other standard liquid handling systems.

The Company

m2p-labs is an internationally 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 great efficiency and excellent quality at low costs. More knowledge from small scale leads to more rational and reliable decisions in the development of bioprocesses.

PRODUCT PORTFOLIO

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.

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