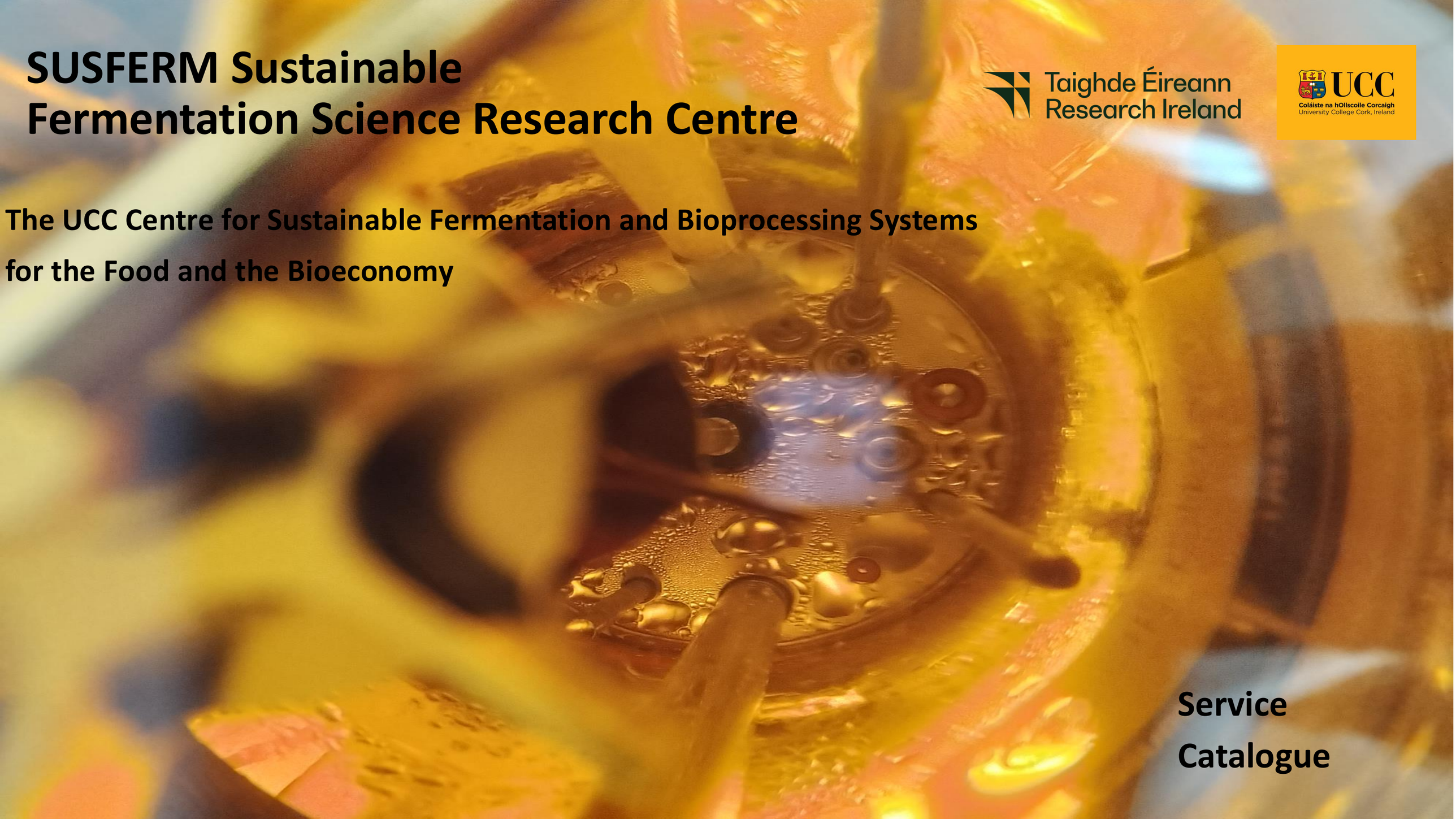
# SUSFERM Sustainable Fermentation Science Research Centre

Taighde Éireann Research Ireland

UCC
Coláiste na hOllscoile Corcaigh
University College Cork, Ireland

**The UCC Centre for Sustainable Fermentation and Bioprocessing Systems for the Food and the Bioeconomy**



## Service Catalogue

Service Catalogue

# Microbial strain screening

**Description :**

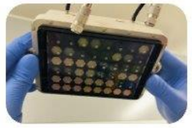
Identify and evaluate the most effective microbial strains for target applications. High-throughput screening techniques (Multi-mode plate reader and incubator, Microbioreactors, BioLectorXT) are applied to assess the performance of a diverse range of microbial candidates, focusing on parameters such as growth rate, yield, and functional properties. This service ensures the selection of optimal strains for target applications.

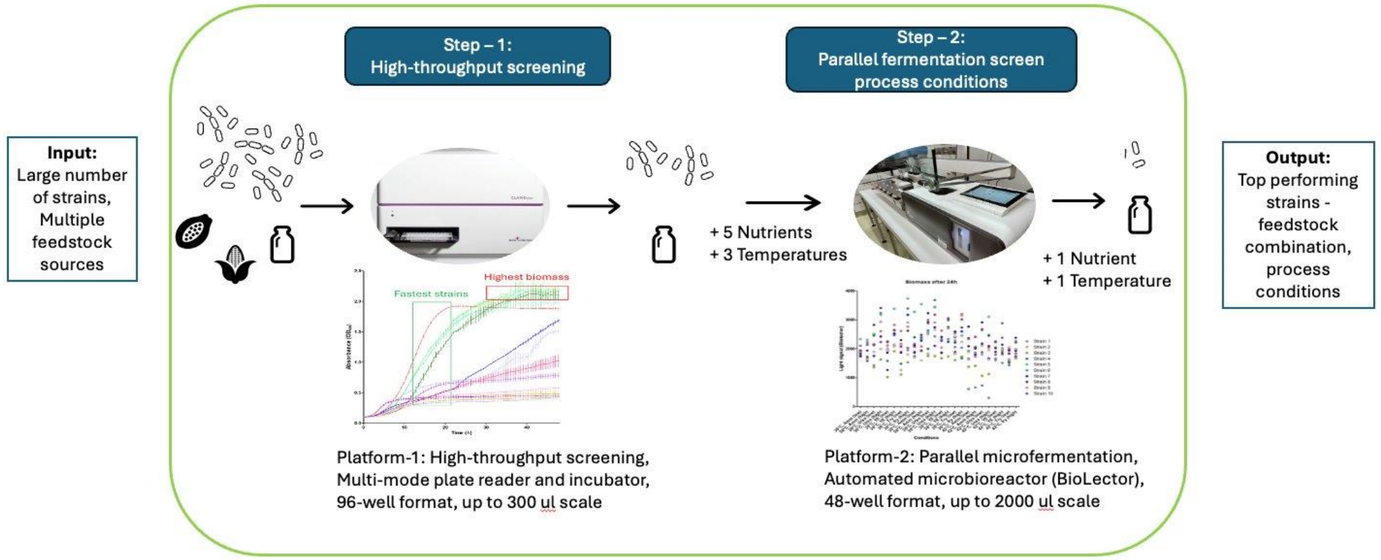
**Service:**

- Strain selection
- Feedstock (Culture media) optimization
- Design culture growth media formulation

**Equipment:**

- Multi-mode plate reader and incubator, Clariostarplus
- Microbioreactor BioLectorXT





Service Catalogue

# Freeze-Drying

**Description :**

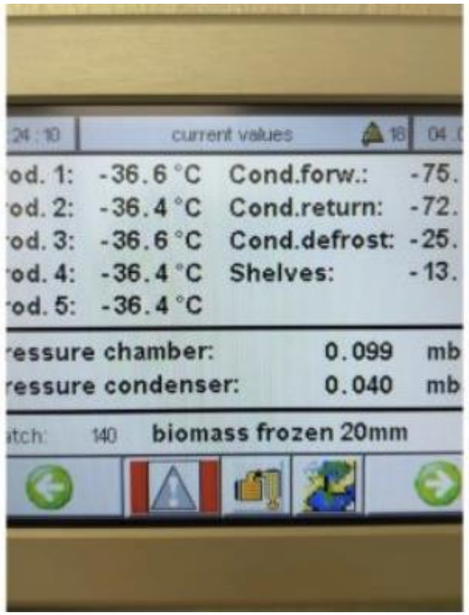
Freeze-dried cultures in powder form are stable, concentrated preparations of microorganisms produced by lyophilization. This process preserves viability and functionality while enabling long-term storage, easy handling, and reproducible reactivation. The SUSFERM provides freeze drying capacity for a wide range of Biotech and Food applications, from 2 Litre up to 20 Litre batch capacity, with condenser capacity up to -80 C.

**Service:**

- Pilot-scale Freeze drying, Zirbus Sublimator

**Equipment:**

- Freeze dryer, Zirbus Sublimator 4 x 5 x 6 (2 to 20 litres batch)




Service Catalogue

# Designing Food-grade Culture media

**Description :**

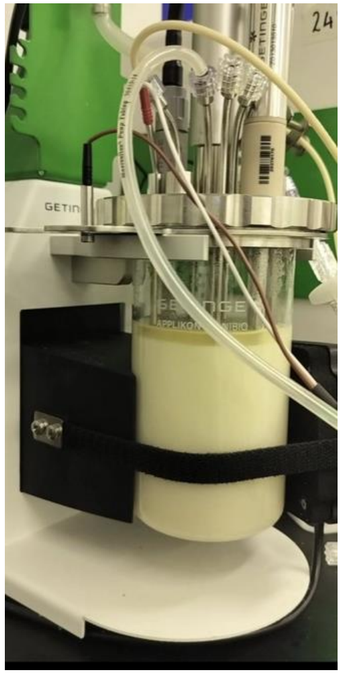
This service supports users in developing food-grade regulatory-compliant, and performance-optimized culture media for biotechnology applications. The service focuses on replacing laboratory-grade components with food-grade industrially relevant formulation, ensuring suitability for scale-up and commercialization.

**Service:**

- Design food-grade culture growth media formulation
- Validate the media at manageable scale (from 400 ml to 4 Litres)

**Equipment:**

- Microbioreactor, BioLectorXT
- Small-scale Bioreactors



Service Catalogue

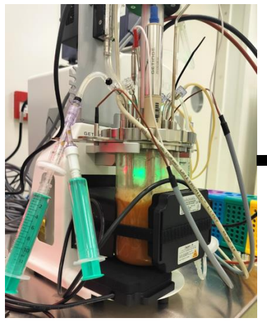
# Bioprocess Workflow Optimisation and scale-up

**Description :**

This service supports users in the development, optimisation, and scale-up of bioprocesses, from small-scale bioreactor systems to pilot-scale operations. It covers the definition of bioprocess strategies, optimisation of key process parameters, and translation of lab-scale processes to pilot-scale bioreactors.

**Service:**

- Bioprocess development and optimisation (small-scale bioreactors)
- Batch and fed-batch strategy optimisation
- Bioprocess scale-up (0.4–5 L → up to 100 L)



**Equipment:**

- Microbioreactor: BioLector XT,
- Small-scale bioreactors: 400 mL to 4 L, myControl Applikon Biotechnology, Sartorius Biostat B
- Pilot-scale bioreactor: Up to 100 L, Sartorius Biostat D DCU

Service Catalogue

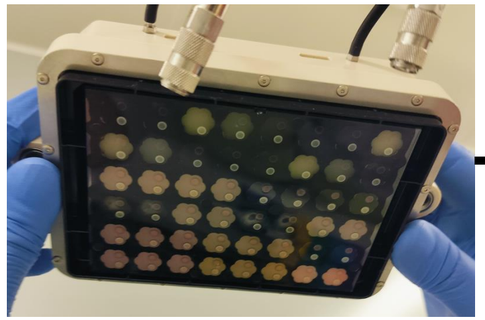
# Optimization and Validation of cultivation medium

**Description :**

This service supports users in the optimisation and validation of cultivation media for enhanced biomass growth and target product formation. Media optimisation is performed using automated microfermentation and small-scale parallel bioreactor platforms, followed by validation under relevant bioreactor conditions at manageable lab and pilot scales.

**Service:**

- Media optimisation (DoE, data-driven) to improve fermentation performance
- Media validation under bioreactor conditions



**Equipment:**

- Microbioreactor: BioLector XT
- Small-scale bioreactors: 400 mL to 4 L, Applikon Biotechnology, Sartorius Biostat B
- Pilot-scale bioreactor: Up to 100 L, Sartorius Biostat D DCU

Service Catalogue

# Develop and validate scale-down model for large scale bioprocesses

**Description :**

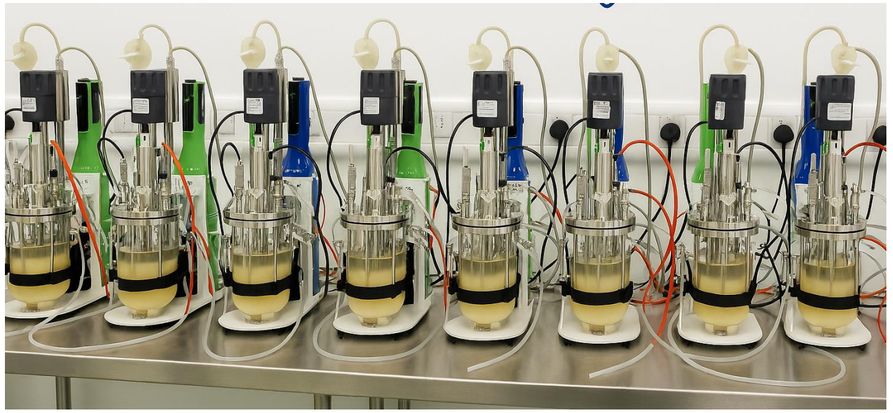
This service provides the development and validation of a scale-down fermentation model using the parallel bioreactor systems in SUSFERM. The scale-down model enables controlled investigation of large-scale bioprocess conditions at smaller scale. The service supports academic and industrial users in understanding process robustness, scale-related heterogeneities, and microbial performance under industrially relevant conditions.

**Service:**

Develop scale down models for bioprocess in large scale industrial bioprocess to investigate relevant parameters for optimisation in smaller scale.

**Equipment:**

Small-scale Bioreactors, 400 ml to 4 Litres,
myControl Applikon BioTechnology



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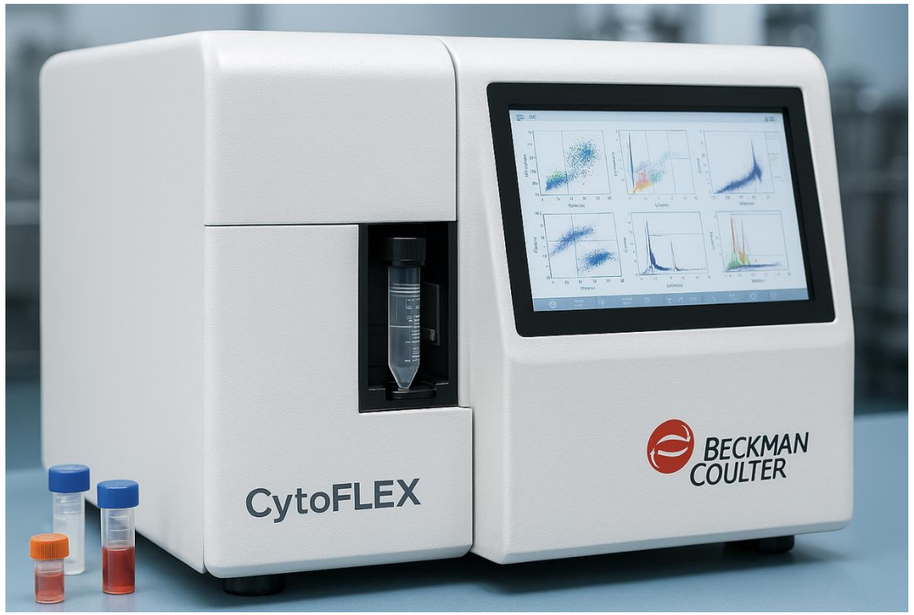
# Microbial viability and vitality analysis

**Description :**

This service provides high-resolution, single-cell analysis of microbial populations relevant to food biotechnology and the bioeconomy sector. Using the **CytoFLEX flow cytometer**, users can rapidly assess cell viability, stress responses, metabolic heterogeneity, and population dynamics throughout fermentation processes.
The service supports R&D teams looking for detailed physiological insights to optimize strain performance, fermentation efficiency, and product yield.




**Service:**

Microbial viability and vitality analysis
Fluorescence-based reporter screening (GFP, RFP, metabolic reporters)

**Equipment:**

Beckman Coulter CytoFLEX Flow Cytometer

Service Catalogue

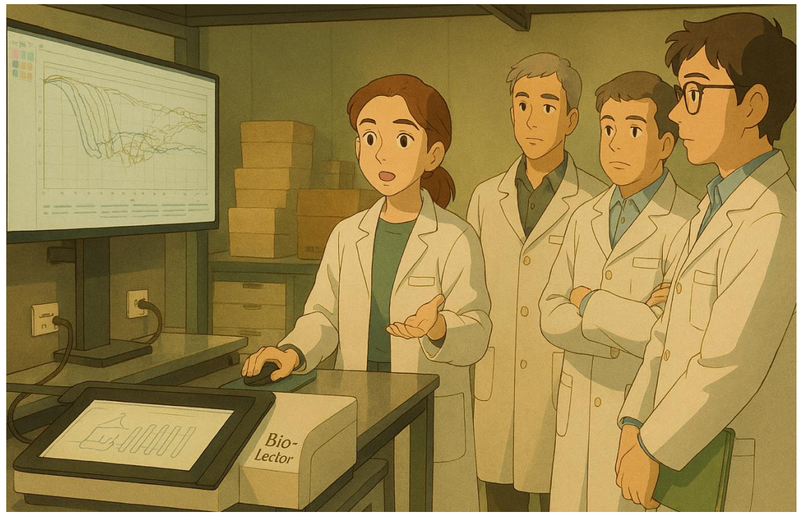
# Specialised Trainings focused on hands-on and practical skills

**Description :**

This service provides training with foundational knowledge of microbial fermentation for food, biotech, and bioeconomy applications. It introduces core principles including microbial growth kinetics, bioprocess parameters, sterility, and media preparation and analytical techniques. The trainings are designed to meet participants from diverse backgrounds and career stages.

**Trainings:**

High throughput-screening using Automated Microbioreactors
Bioreactors-in-action
Scale-up and Technology transfer




**Equipment:**

Microbioreactor: BioLector XT

Small-scale Bioreactors, 400 ml to 4 Litres,

myControl Applikon BioTechnology