PRESENTED BY

iMEAN



Digital Modelling & In-Silico Optimization for Industrial Bioprocesses

2 AND 3 DECEMBER 2026

BIOKET MASTER CLASSES | BIOECONOMY FOR CHANGE

MASTERCLASS | 2 DAYS

ABOUT BIOKET MASTERCLASSES

Advanced expertise. Practical application. Industrial impact.

BIOKET Masterclasses are designed to deepen technical knowledge and accelerate the practical application of key enabling technologies across the bioeconomy. They connect science, industry and real operational environments through high-level learning experiences led by experts directly involved in industrial processes and technology development.

The in-person format provides an immersive learning experience, allowing participants to explore methodologies in depth, engage with specialists, discover pilot-scale facilities and connect theoretical knowledge with real industrial applications.

The BIOKET approach

Move beyond theory. Understand how technologies work in practice, how they are scaled, and how they can be implemented effectively in an industrial context.

What participants can expect

- Applied technical learning built around industrial challenges.
- Direct exchanges with specialists and technology providers.
- Industrial case studies, demonstrations and pilot-scale perspectives.
- Tools and knowledge to support process optimization and faster decision-making.
- A learning environment connecting innovation, scale-up and operational excellence.

BIOKET Masterclasses are part of BIOKET's broader international platform for advancing the bioeconomy through technology, collaboration and industrial deployment.

international.bioeconomyforchange.eu
BIOKET Bioeconomy Key Enabling Technologies platform
info@bioket.bio

ABOUT IMEAN

Unlocking the potential of living organisms through computational biology

For more than seven years, iMEAN has been developing and commercializing biomodeling solutions for all sectors of the life sciences, combining expertise in systems biology, bioinformatics and computational modelling.

The company has developed a unique modelling platform for industrial companies seeking to integrate cutting-edge technology into their R&D programs. With more than 130 modelling projects completed for its clients, iMEAN has built a unique perspective on the challenges and performance levers associated with integrating modelling into R&D.

Its advanced in silico models, or digital organisms, provide a comprehensive view of cellular processes and support the integration and analysis of biological data.

iMEAN's tools also take into account the biotic and abiotic conditions of bioprocesses and enable the development of multi-scale models involving multiple organisms, including consortia and microbiomes.

Through these capabilities, iMEAN helps researchers and industrial companies transform biological data into actionable insights and optimize their R&D strategies.

Key areas of expertise

- Genome-scale metabolic and regulatory modelling
- Systems and synthetic biology
- Metabolic engineering
- Bioinformatics and biostatistics
- Integration and analysis of omics data
- Multi-scale and multi-organism modelling

https://imean-biotech.com/
iMEAN
contact@imean-biotech.com

COMMON CORE

Theory + Hands On



DETAILED PROGRAM - DAY 1 - DECEMBER 2

08:30 - 09:00 AM	**Registration and Welcome**
09:00 - 10:30 AM	**Theoretical Module 1 – Part 1** • Why Use Modeling in R&D? – Introduction to the Main Concepts • Challenges in biotechnology R&D: understanding and harnessing the complexity of living systems. • The key stages of digitalization in biology and an educational overview of the main types of mathematical models. • Strengths and weaknesses of AI models vs. mechanistic models.
10:30 - 10:45 AM	**Break**
10:45 AM - 12:00 PM	**Theoretical Module 1 – Part 2** • Modeling Metabolism and Bioprocesses – Introduction to the Main Concepts • Introduction to metabolic modeling: genome-scale metabolic networks (construction – curation – validation of predictive capabilities). • Exploration of the properties of living organisms using metabolic models. • Bioprocess simulations.
12:00 - 1:30 PM	**Lunch**

COMMON CORE

Theory + Hands On



DETAILED PROGRAM - DAY 1 - DECEMBER 2

1:30 - 3:15 PM	**Practical Module 1 – Part 1** • Hands-on Practice Based on Case Studies • Introduction to exploring metabolic properties (identifying microorganisms' production capabilities and their nutritional requirements) • Introduction to simulating the metabolic behavior of living organisms (predicting microorganism growth and predicting optimal production of compounds of interest)
3:15 - 3:30 PM	**Break**
3:30 - 4:30 PM	**Practical Module 1 – Part 2** • Hands-on Practice Based on Case Studies • Introduction to industrial process simulation (designing in silico experiments to mimic industrial processes, simulation parameterization, and analysis of results). • Identifying optimization levers through modeling.

SPECIALIZED TRACK

Operational Track - Engineers, Project Managers, Experts



DETAILED PROGRAM - DAY 2 - DECEMBER 3

08:30 - 09:00 AM	**Registration and Welcome**
09:00 - 10:15 AM	**Operational Track Module – Part 1** • Introduction to Advanced Simulation Methods and Hands-on Practice – "Burden" Model • Introduction to the impact of cellular crowding, i.e. the limited volume within cells—the "Burden effect"—on cellular physiology and methods for modeling it. • Process simulations using cellular crowding models (Burden effect).
10:15 - 10:30 AM	**Break**
10:30 AM - 12:00 PM	**Operational Track Module – Part 2** • Introduction to Advanced Simulation Methods and Hands-on Practice – Regulation • Introduction to the impact of regulatory networks, i.e. cellular signaling cascades, on cellular physiology and methods for modeling them. • Bioprocess simulations incorporating regulatory networks.
12:00 - 1:30 PM	**Lunch**

SPECIALIZED TRACK

Operational Track - Engineers, Project Managers, Experts



DETAILED PROGRAM - DAY 2 - DECEMBER 3

1:30 - 3:15 PM	**Operational Track Module – Part 3** • Introduction to OMICS Data Integration Methods and Hands-on Practice • Introduction to methods for integrating large-scale data such as OMICS data. • Bioprocess simulations incorporating OMICS data.
3:15 - 3:30 PM	**Break**
3:30 - 4:30 PM	**Operational Track Module – Part 4** • Introduction to Modeling the Population Dynamics of Microbial Communities • Introduction to the challenges involved in modeling microbial communities and methods for modeling them in the context of bioprocesses. • Simulation of microbial communities in the context of bioprocesses.

SPECIALIZED TRACK

Executive Track - CXOs and Managers



DETAILED PROGRAM - DAY 2 - DECEMBER 3

08:30 - 09:00 AM	**Registration and Welcome**
09:00 - 10:15 AM	**Executive Track Module – Part 1** • Modeling and Simulation: Technology Building Blocks for Addressing R&D Bottlenecks • Presentation of the most advanced technology building blocks and an outlook on upcoming innovations and their applications for unlocking R&D programs. • Practical case study on integrating modeling into R&D programs.
10:15 - 10:30 AM	**Break**
10:30 AM - 12:00 PM	**Executive Track Module – Part 2** • R&D Laboratory Digitalization Strategy and Data Valorization • Presentation of the main principles of laboratory digitalization and its key challenges. • What is the value of data?
12:00 - 1:30 PM	**Lunch**

SPECIALIZED TRACK

Executive Track - CXOs and Managers



DETAILED PROGRAM - DAY 2 - DECEMBER 3

1:30 - 3:15 PM	**Executive Track Module – Part 3** • Case Study: Integrating Modeling into R&D Strategy + Practical Case of Digital Strategy Integration • Co-development of a list of concrete bottlenecks encountered throughout the different stages of bioprocess R&D. • Co-development of modeling solutions to help address bottlenecks throughout the different stages of R&D: Why, Where, When and How?
3:15 - 3:30 PM	**Break**
3:30 - 4:30 PM	**Executive Track Module – Part 4** • Case Study: ROI Calculation Across the Entire Biotechnology R&D Roadmap • Design of an R&D roadmap based on concrete bioprocess development cases, from idea to industrialization. • Co-development of modeling solutions across the entire R&D roadmap; calculation of the ROI of modeling and the value created by data.

PRACTICAL INFORMATION

Training Venue
Imean
135 avenue de Rangueil, INSA Bâtiment 50
31077 Toulouse Cedex 4

Participants are free to choose the hotel that best suits their preferences and convenience. However, we have listed below a selection of recommended hotels:

Recommended Hotels: list available soon

Important Information
Accommodation and any related expenses are not included in the Masterclass registration fee. Participants are responsible for arranging and paying for their own accommodation.

Training language: English

The detailed program may be adjusted by the training team to optimize the learning experience.

CONTACT

Johan De Coninck
International Development Director
j.deconinck@bioeconomyforchange.eu

Renata Abreu
International Development Manager
r.abreu@bioeconomyforchange.eu

international.bioeconomyforchange.eu
BIOKET Bioeconomy Key Enabling Technologies platform
info@bioket.bio

Digital Modelling & In-Silico Optimization for Industrial Bioprocesses

MASTERCLASS | 2 DAYS | 2 AND 3 DECEMBER 2026

BIOKET MASTER CLASSES | BIOECONOMY FOR CHANGE