



Bioindustry 4.0 : Leveraging advanced digital solutions to empower the European bioindustry sector

Lilian FAVACHO RODRIGUES | Bioeconomy For Change | AFT 2026 | 30 June 2026



**Funded by
the European Union**

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union. Neither the European Union nor the granting authority can be held responsible for them.

Présentation B4C

Introduction



**Lilian FAVACHO
RODRIGUES**
Competitive Intelligence
Consultant



Audrey MAGNIN
Responsable innovation
Molécules & Matériaux
biosourcés



l.favachorodrigues@b4c.org



06 12 73 32 11



a.magnin@b4c.org



06 15 08 46 21





LE RÉSEAU DE LA BIOÉCONOMIE



Compétitivité



Connexion



Climat



Citoyen

www.bioeconomyforchange.eu





B4C IN A FEW WORDS

KEY FIGURES & AVAILABLE TOOLS



A network covering the entire bioeconomy

500 members | **5 Innovation Communities**
2 Public Affairs Communities



High-quality events

45 events per year | **4 000 participants**
(total for 2024)



Project support

Over 520 projects supported
(since 2005) | **€3 billion in investments**



A Bioeconomy monitoring platform

3 600 + registered users | **24 000 resources**



A promoter of the bioeconomy

Active at national and European level | **Presence in key strategic decision-making bodies**



International recognition

2 000 international contacts | **25+ countries with established connections**

A UNIQUE ECOSYSTEM

ACCELERATE YOUR PROJECTS AND FIND THE RIGHT PARTNERS



A diverse network of stakeholders covering the bioeconomy value chains

18%

Large companies / Mid-cap firms

19%

SMEs

33%

Microenterprises & Startups

15%

Academia & Research

11%

Federations, Institutions, Consultancies

4%

Other stakeholders (banks, investors, venture capital firms, etc.)

Non-exhaustive list
Data as of Dec. 1, 2025



[Explore the full network](#)

STAKEHOLDER ENGAGEMENT

B4C as a partner in EU projects

Contribution to **20 EU Funded projects since 2009, including 11 BBI-CBE JU**

- at **different TRL** : *Research & innovation actions ; Innovation actions DEMO and FLAGSHIP; coordination and support actions*
- on **several bioeconomy topics** : *bio-based materials, organic acids, food and feed ingredients, green solvents, DSP, etc.)*

Communication & Dissemination

- **Stakeholders engagement** : mobilisation of our network (FR and EU), calls for interest and partnerships
- Management of **website** and **social networks**
- **Communication materials** : visual identity, promotional documents, motion design videos, interviews, press releases, newsletter, etc.
- Showcase and representation in EU **events** and **conferences**

Exploitation: Market studies, replicability studies, industrial workshops, Advisory Board

10 Ongoing Projects



Past projects



Smart Digital Solutions for a Sustainable European Biotech Industry

Bioindustry 4.0 brings together **academia** and **industry**: 25 partner organizations and **6 major European research infrastructures**...



...to make **bioprocess design and control** faster, cheaper, and more sustainable.



Bioindustry 4.0 wants to support a **smart industry** approach to biomanufacturing, which can accelerate the R&D phase and reduce its cost, as well as **de-risk bioprocesses** before scale-up to commercial scale.

The project seeks to support the adoption of advanced digital tools by the European biotech sector by developing:

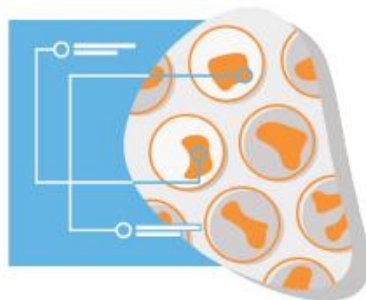
Innovative
measurement devices
for online monitoring



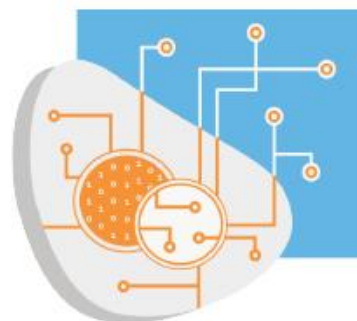
Data fabric



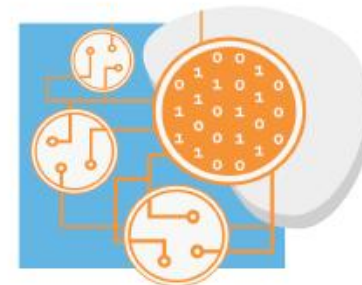
Strain discovery and
support systems



Digital shadows
for bioprocess design



Digital twins for
bioprocess control

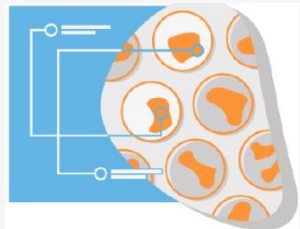


Bioindustry 4.0 is designed to help to make smart biomanufacturing reality



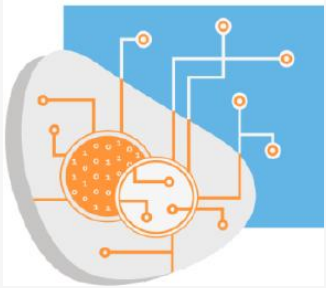
Data fabric – A **standardized** and **secure data platform** that enables organizations to structure, share, and access **high-quality datasets** across **multiple locations**, providing AI-ready data for developing tools such as digital twins and other data-driven bioprocess solutions.

Advanced process analytical technology (PAT) devices – **Novel sensor technologies** that enable **real-time, in-line monitoring** of bioprocesses, providing **continuous process data** to improve process understanding and support automated process control.



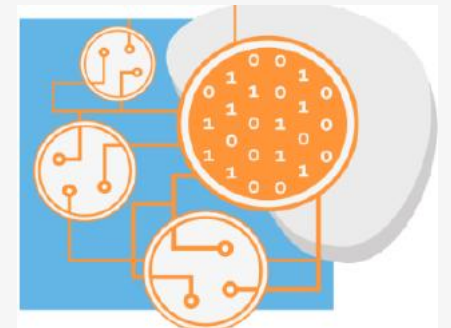
Strain discovery tool and decision support system – **Novel tools** that enable **large-scale searching** and **analysis** of standardized microbial strain data. The **strain discovery tool** integrates data from multiple culture collections into a unified format, enhancing strain identification and comparison, while the **decision support system** helps users select optimal strains for specific applications and supports strain engineering effort.

Bioindustry 4.0 is designed to help to make smart biomanufacturing reality



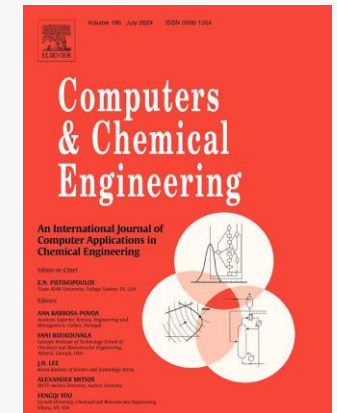
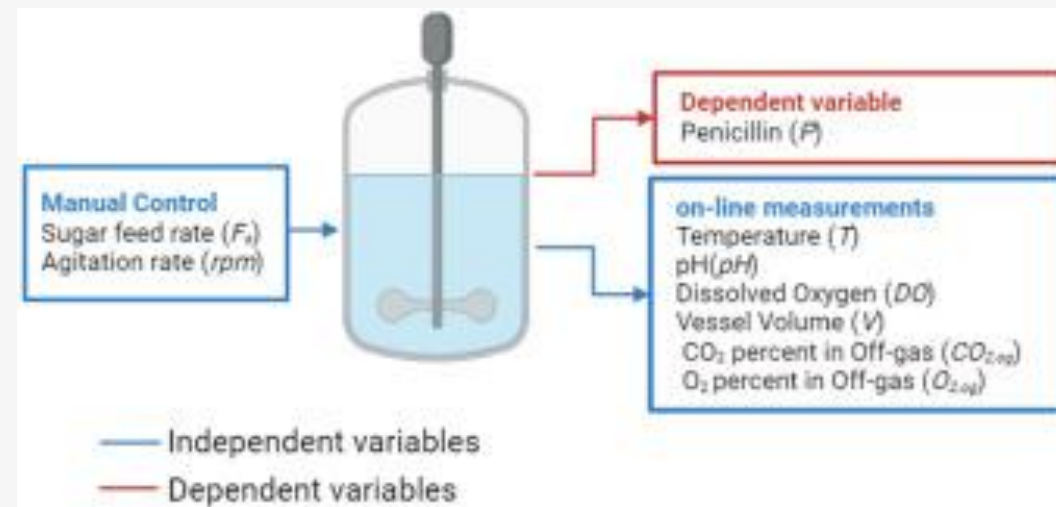
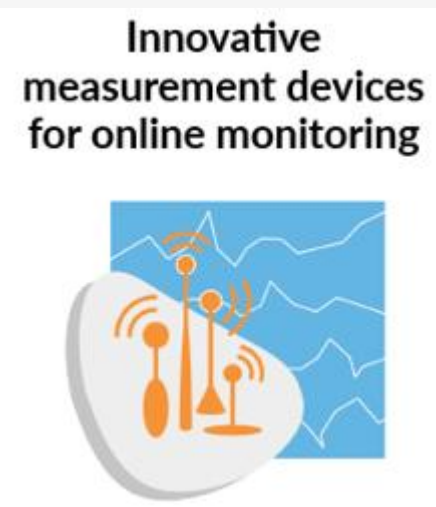
Digital shadows for bioprocess design – Advanced data-driven models that combine biological and physical knowledge with experimental datasets to **simulate bioreactor behavior**, helping R&D teams better understand processes, optimize designs, and generate new insights.

Digital twins for bioprocess control – Real-time virtual models of bioprocesses that combine **bioreactor models**, **AI**, and **sensor data** to enable process **monitoring**, **optimization**, and **automated control**, paving the way for autonomous and quality-by-design biomanufacturing.



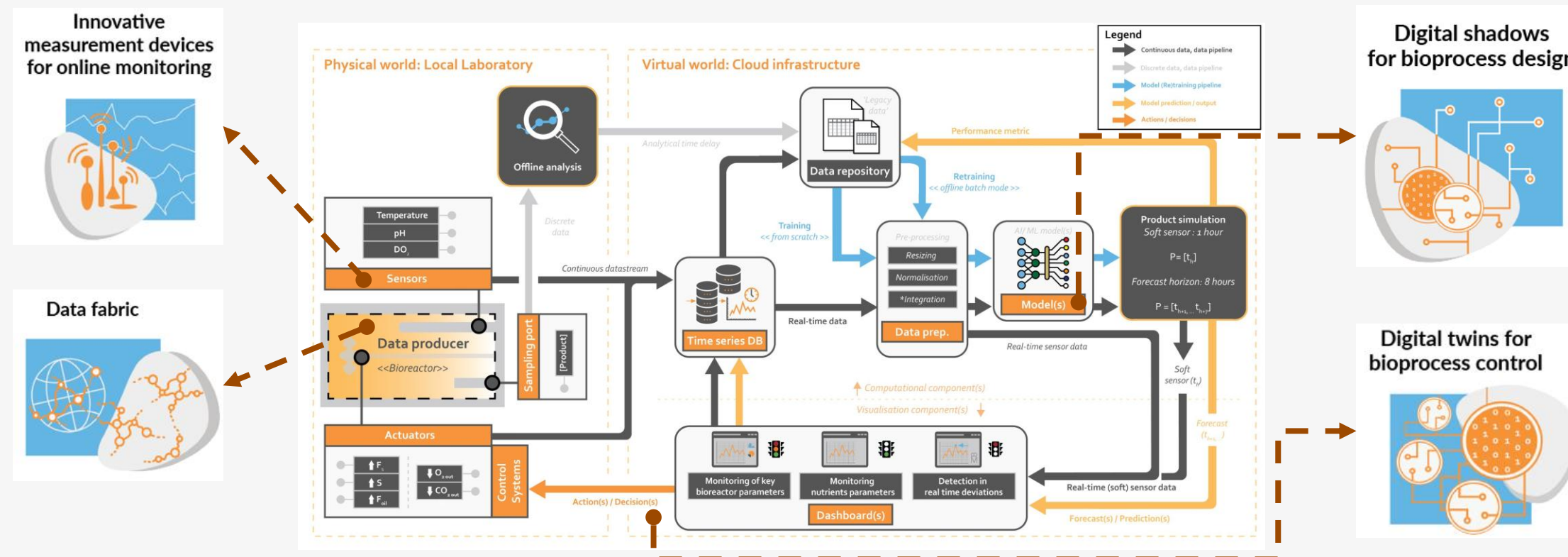
Achievements

- “Soft sensors based on interpretable learners for industrial-scale fed-batch fermentation: Learning from simulations”



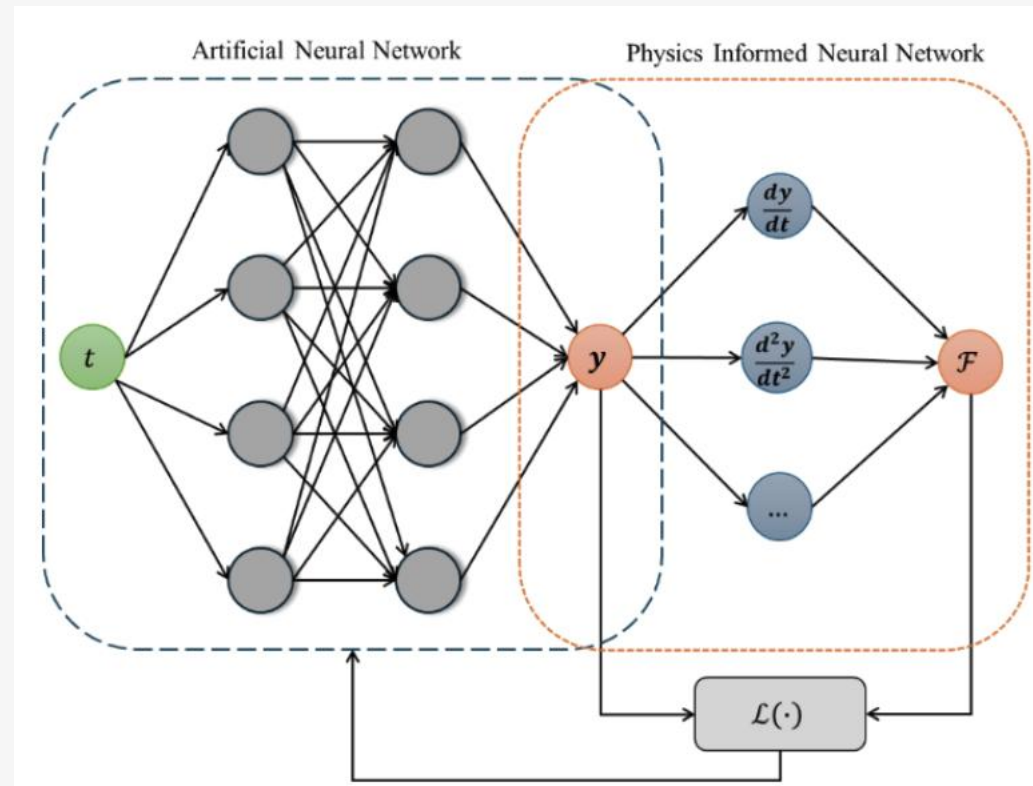
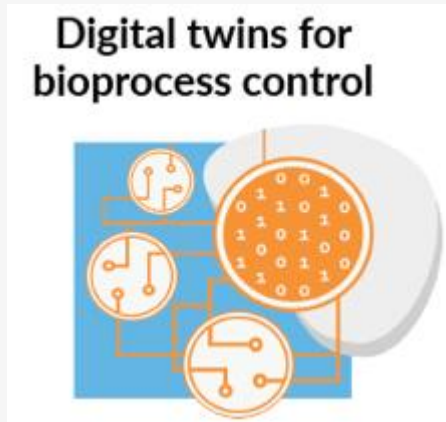
Achievements

- « Towards a machine learning operations (MLOps) soft sensor for real-time predictions in industrial-scale fed-batch fermentation »



Achievements

- “A Physics-Informed Approach to Dynamic Modeling and Parameter Estimation in Biotechnology”



Achievements



MIRRI MICROBIAL ERIC
RESEARCH INFRASTRUCTURE
EUROPEAN RESEARCH INFRASTRUCTURE CONSORTIUM



**StrainsBook, Strain Discovery Interface and
Bioindustry 4.0 - WP6**

**Strain discovery and
support systems**



Integrated data from multiple culture collections (MIRRI database)



~ 6,000

strains available



~ 150 physiological features added

*(assimilation, fermentation, growth
properties, etc.)*

Do you want to contribute to the services developed ?



24-25 September 2026
Espaces Vanel - Médiathèque de Toulouse

The event will bring together European research projects, technology developers, industrial biotechnology stakeholders and end users to discuss **how AI, automation, digital twins and data-driven tools can support the next generation of competitive and sustainable biomanufacturing.**

Beyond presenting results from the BIOS and Bioindustry 4.0 projects, the objective is to engage directly with industry and discuss a key question: how can these technologies become truly useful, adoptable and valuable for companies?

The programme will include:

- plenary sessions on AI, automation, digital twins and bioprocess monitoring;
- industrial use cases and success stories;
- a dedicated discussion on AI & Digitization - Industry & Investment;
- collaborative workshops between academic and industrial participants.

Share your interest





**Retrouvez-nous sur
bioeconomyforchange.eu**

