INDUSTRIAL BIOTECHNOLOGY INNOVATION AND SYNTHETIC BIOLOGY ACCELERATION

EU-IBISBA is an emerging ESFRI-approved (2018), distributed European research and innovation infrastructure that will support industrial biotechnology and synthetic biology. In doing so, it aims to promote the transition to a circular bioeconomy in Europe.

Currently, EU-IBISBA is being developed by partners from nine European member states. Their common ambition is to create an array of services that will enhance the operation of each partner’s research facilities, offer researchers access to best-in-class research infrastructure and supply industry with a reliable intermediary for end-to-end bioprocess development.

INDUSTRIAL BIOTECHNOLOGY IS A KEY ENABLING TECHNOLOGY (KET) OF THE BIOECONOMY.

Accounting for the key status of industrial biotechnology, this area merits special focus and more common effort. Biocatalysis provides unique capability to convert complex biobased resources into a whole range of valuable products, but the full potential of industrial biotechnology as a manufacturing technology has not yet been reached. To achieve this, the R&I phases that convert concepts into pre-industrial processes must be accelerated and the resulting bioprocesses need to be increasingly robust, reliable and resilient.

EU-IBISBA’s mission is to promote Industrial Biotechnology as a mature manufacturing technology to support the growth of the circular bioeconomy.
MEMBER STATE SUPPORT

Led by France, the EU-IBISBA partnership is currently composed of research operators (RTOs, universities etc) from 9 EU member states. As EU-IBISBA moves towards its preparation phase, the partnership remains open. Infrastructure operators across Europe are welcome to contact us for more information on how to become involved.

NETWORK SERVICES

As a pan-European coordination entity, EU-IBISBA will provide the networking tools to research facilities in different EU countries.

- A one stop shop for R&I infrastructure services, creating pan-European visibility and a simplified interface for users.
- Business IT tools providing facilities with the means to share knowledge assets, execute and monitor community business operations and audit projects.
- Assembly and integration of research infrastructure services, leading to new integrated service offers.
- Co-developed assets (e.g. business practices) that ensure the interoperability of the network.

BENEFITS OF NETWORKING

The current organisation of research leads to uncoordinated duplication at both strategic and operational levels across Europe, and even within single countries. From an economic standpoint, this is wasteful and hampers the ability of existing facilities to offer research services due to lack of critical mass, standardisation, interoperability and reproducibility.

Networking individual infrastructure facilities is a viable way to create synergy and cross-fertilisation among experts from different scientific theme areas, diminish duplication and cut costs.

Networking provides opportunities to improve existing services and create new ones. Naturally, these benefit from the improved capacity of the facilities to work with one another, developing and adopting standard business practices and common norms.
INDUSTRIAL BIOTECHNOLOGY GAME CHANGERS

Industrial Biotechnology is at a crucial point in its development. This technology family is supported by numerous sub-areas of life sciences research, with synthetic biology being an important one. This new technology is a potential game changer for industrial biotechnology because it promises to bring engineering principles to biology, allowing the creation of robust, reliable and resilient bioprocesses.

For synthetic biology to produce impact on industrial biotechnology a more common focus is needed, combined with the development and acceptance of standards and practices and increased interoperability. Moreover, synthetic biology must integrate into the wider bioprocess development scheme and the whole value chain from raw material to product, combining biocatalyst design with process and value chain conception.

Industrial biotechnology is also inextricably linked to chemical engineering. In this respect, it will benefit from the considerable knowhow previously developed in the petrochemical industry, learning from its principles and how synergies have been built with chemistry. However to achieve this, education must strive to better associate biosciences and chemical disciplines in university curricula and offer suitable advanced training in bioprocess development.

INNOVATION SERVICES

To support the development of synthetic biology and the development of integrated bioprocess development EU-IBISBA will create several innovation services for the industrial biotechnology community.

- Workflows and standards that will improve interoperability and reproducibility.
- A web-based repository for knowledge assets related to industrial biotechnology.
- Knowledge engineering-driven approaches and artificial intelligence for better bioprocess design (e.g. decision support systems and digital twins of bioprocesses).
- Subsidised research infrastructure access for academic researchers wishing to translate research results into pre-industrial innovation.
- Seamless design-build-test-learn cycles of integrated bioprocess development, leading to the delivery of tested bioprocesses (up to TRL5) ready for industry R&I development.

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BUILDING THE FUTURE

Industrial biotechnology is set to play a major role in Europe’s emerging circular bioeconomy. Historically, Europe has strength in this area, producing a number of global company leaders. However, the success of the circular bioeconomy transition will depend on the wider adoption of industrial biotechnology, beyond the elite community of industry specialists.

Several industrial biotechnology hotspots are already visible in Europe, and others will develop in the future. To achieve a rational deployment of the industry across Europe, interregional cooperation is vital to optimise the use of resources, stimulate excellence and innovation and ensure adequate coverage of the continent’s needs. To achieve this, public authorities require the insight of industrial biotechnology specialists to target investment, anticipate on future needs and to interconnect European industrial biotechnology regional players.

SUPPORT SERVICES

EU-IBISBA forms a nexus, connecting and offering a wide range of services to different industrial biotechnology stakeholders.

- A forum for European industry, including individual companies business clusters and industrial consortia.

- A partner for public authorities seeking a pan-European vision and scientific and technology foresight to support territorial investment.

- Information for regional partners and the wider public on industrial biotechnology and how it can help to provide new manufactured products and create added-value in territories using regional resources.

- A focal point for other European infrastructure seeking to offer their services to the industrial biotechnology sector.

- Training on state of the art in industrial biotechnology for both early career stage researchers and for industrial biotechnology professionals.

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