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Universidad de Alcalá

Success Case: Research and Innovation Action (RIA) "FLEXIZYME"

COOPERATE4EU 2.0

GOBIERNO DE ESPAÑA | MINISTERIO DE CIENCIA, INNOVACIÓN Y UNIVERSIDADES | AGENCIA ESTATAL DE INVESTIGACIÓN

ESTA PRESENTACIÓN ES PARTE DE LA ACTUACIÓN GPE2023-001215-P, FINANCIADO POR MCIN/AEI/10.13039/501100011033.

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The topic

HORIZON-JU-CBE-2023-R-03:

Robust and optimised industrial biotech and chemical/industrial biotech processes.

OUTCOMES:

- (Industrial) biotech or chemical/(industrial) biotech processing routes with improved efficiency compared to established routes, or completely new processing routes that are currently unavailable;
- Cost-competitive bio-based products;
- Improvement of the environmental performance of bio-based processes through resource-efficient valorisation of sustainable biomass feedstock, while addressing (i.e. reduction/elimination) pollution issues in production processes;
- Significant improvement environmental performance across the value chain against specified fossil and/or bio-based benchmarks;
- Improved circularity and resource efficiency via practical application of the circular (bio)economy concept;
- Availability of a broader range of bio-based products meeting market requirements.

The topic

HORIZON-JU-CBE-2023-R-03:

Robust and optimised industrial biotech and chemical/industrial biotech processes.

SCOPE

- Identify existing, industrially relevant, bio-based process(es) (upstream and conversion steps) and identify the areas of intervention and bottlenecks to improve process flexibility, robustness, techno-economic feasibility and environmental performance. The proposal should consider the case of developing combined processes using biotech and chemical[1] approaches synergistically in order to optimise process and/or (bio)catalyst design for obtaining bio-based products.

- Incorporate reactor design (e.g. membrane reactors, small-scale reactors, microfluidics), process design, process control and optimisation as well as catalysis optimisation aspects that are relevant to also enable tandem chemical/biotech processes, and where applicable for optimisation of continuous production approaches (batch2continuous).

- Identify, optimize/engineer and test more active and robust microbial hosts and their enzymes, or other (bio)catalysts, against relevant process conditions (including physical and chemical stressors). The projects should also consider integrating the biofoundry and synthetic biology advances

- Ensure and assess productivity, yield, robustness, flexibility of the process.

The project

Construction of a **FLEXI**ble and adaptable **ENZY**Matic biotechnological platform for sustainable industrial production of bio-based FAs from side stream materials

CBE JU contribution: 4,984,163.75 €

Duration: Desde: 1 Junio 2024 hasta: 31 Mayo 2028

Feedstock: fats (vegetable oil, proteins (legumes), and other biomass feedstocks as raw materials

Main products: agricultural products, detergents, cosmetics

Evaluation Score:15/15

Website: https://www.flexizyme.eu/

FLEXIZYME *tiene como objetivo contribuir a la transición hacia procesos industriales biotecnológicos respetuosos con el medio ambiente para la obtención de una variedad de productos bio-basados competitivos en costos, mediante la valorización circular y eficiente de recursos a partir de subproductos sostenibles.*

The project

Construction of a **FLEXI**ble and adaptable **ENZY**Matic biotechnological platform for sustainable industrial production of bio-based FAs from side stream materials

- **El enfoque de innovación interdisciplinario y sistémico de FLEXIZYME tiene como objetivo desarrollar (hasta TRL5) una plataforma biotecnológica versátil, flexible y rentable para la producción primaria de ácidos grasos (FAs) a partir de materias primas ricas en grasas y proteínas. Esta plataforma diseñará y utilizará enzimas avanzadas empleando herramientas bioinformáticas de última generación e inteligencia artificial (IA) para optimizar los procesos, sistemas innovadores de monitoreo de reactores, y abordar los desafíos de escalabilidad e integración de procesos, contribuyendo a un futuro más verde y sostenible para la producción comercial de ácidos grasos.**

- **FLEXIZYME propone producir y validar ácidos grasos (FAs) primarios biotecnológicos de diferentes longitudes de cadena (C10 a C18) en tres de los sectores más relevantes: i) productos cosméticos; ii) detergentes; y iii) agricultura. Además, busca demostrar su compromiso para abordar las necesidades específicas de la industria y fomentar una economía circular.**

The Consortium

Project lead: ITENE

6 RTOs
1 Association

6 SMEs

6 Large Companies

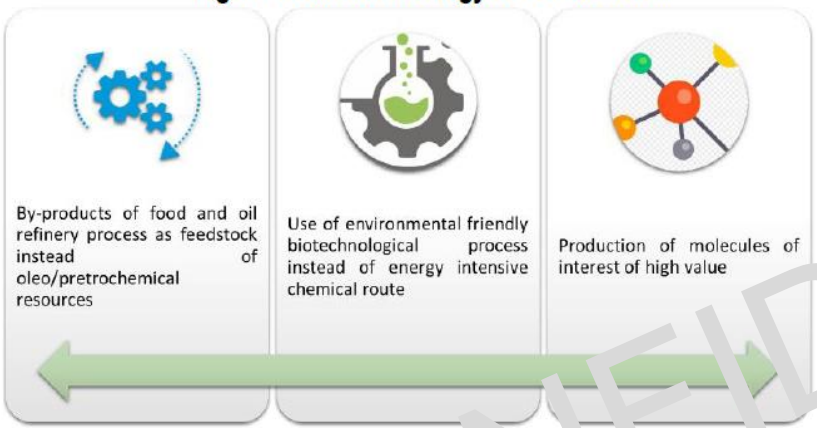
***External Advisory Board:** 1 RTO, 1 SME, 1 Large

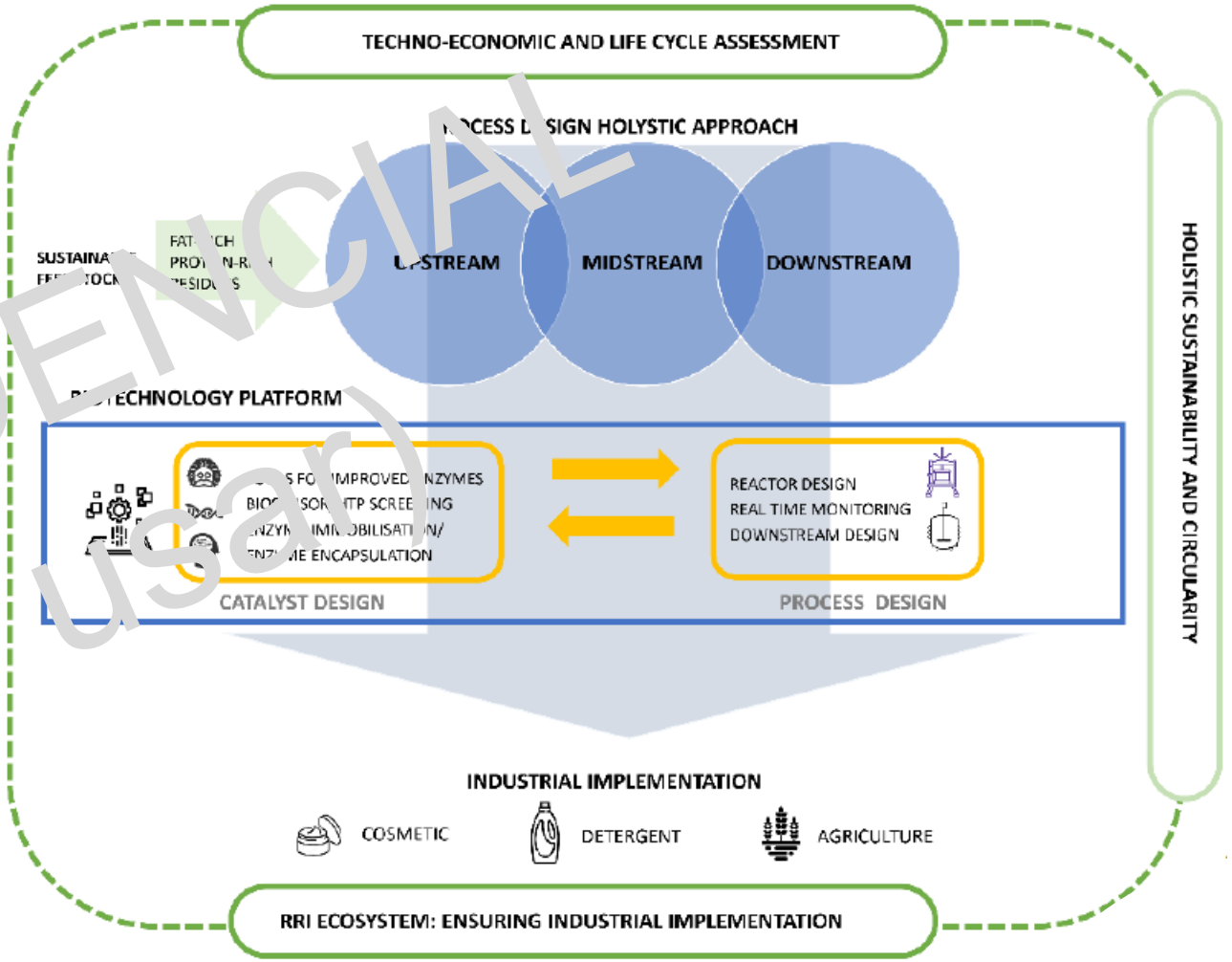
COUNTRY	TYPE
Spain	RTO
Greece	NGO
Netherlands	SME
Netherlands	SME
Netherlands	SME
Italy	SME
Greece	RTO
Spain	RTO
Belgium	SME (Non-P)
Greece	RTO
Italy	RTO
Italy	Large
Greece	SME
Netherlands	RTO
Spain	Large
Spain	Large
Spain	Large
France	Large
France	Large

How the challenge is addressed:

- **Estrategia del proyecto:**

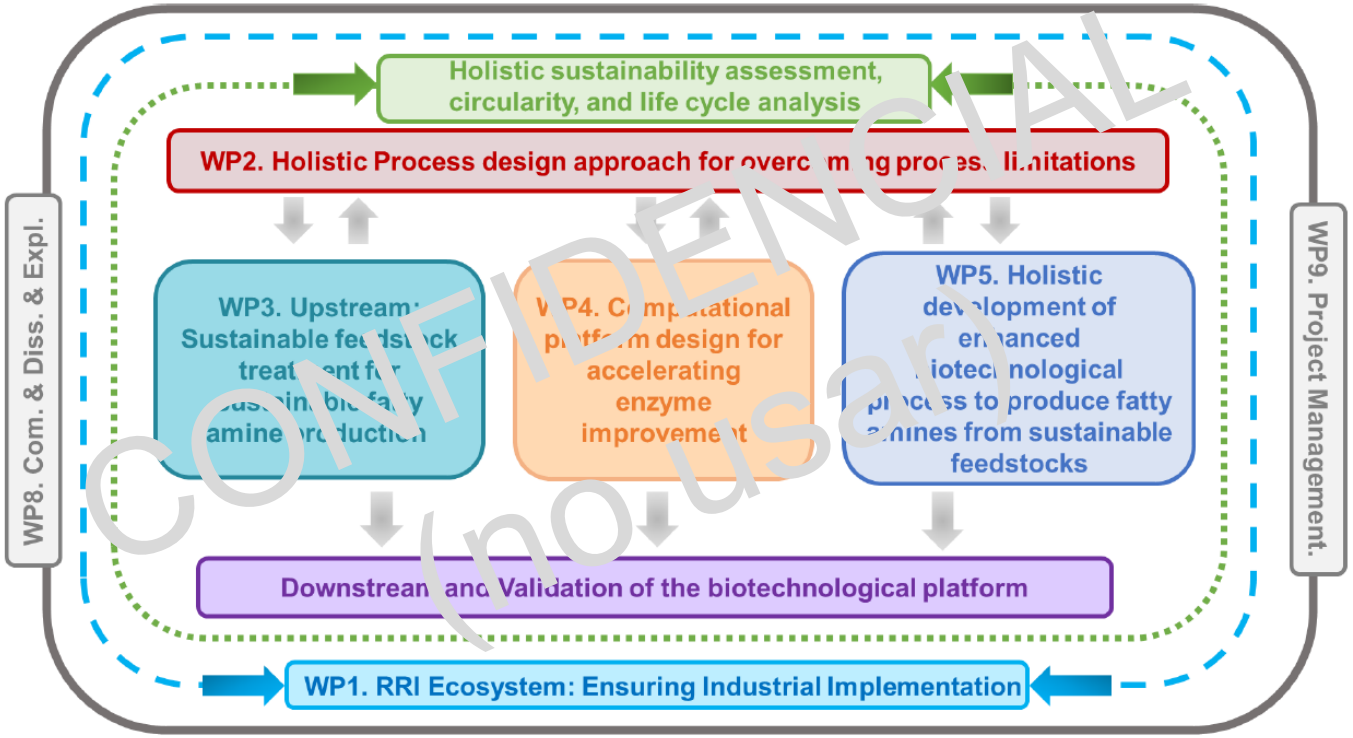
Figure 1. Overall strategy of FLEXIZYME.





Project preparation plan

1. **The Concept Note:** el coordinador tiene la idea principal e identifica los perfiles de socios necesarios.
2. **Búsqueda de socios:** según los perfiles identificados por el coordinador y los socios que se van sumando al consorcio.
3. **Kick Off Meeting:** una vez identificado y confirmado los socios “core” del proyecto, se organizará la KOM para: i) Explicar los detalles del topic ii) Paquetes de Trabajo: acordar la estructura, contenido y liderazgos iii) Establecer fechas límites internas de preparación de las diferentes Y CUMPLIRLAS
4. **WPs Technical Meetings:** organizar reuniones por WP con los socios implicados en ese WP



5. Comenzamos a escribir! (todos los socios)

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Escritura de la propuesta: estructura de la parte B

1. **EXCELLENCE:** objectives, relation to the work program, concept, methodology and ambition.
2. **IMPACT:** users and market characterization, business plan, Market barriers, IPR and regulatory issues, research data management, value chain and communication activities.
3. **IMPLEMENTATION:** work packagers, risks, milestones, management structures and resources to be committed.

Sections 1, 2, 3: Project description.

50 pages limit!

Escritura de la propuesta: estructura de la parte B

1.**Excellence**

1.1 Long-term vision

•Describe your vision of the radically new technology, towards which the project would contribute in the long term.

1.2 Science-towards-technology breakthrough

•Describe in concrete terms the science-towards-technology breakthrough of the project.

•Describe the relevant state-of-the-art and discuss the novelty and ambition of the proposed breakthrough with respect to it.

•Describe the contribution of the science-towards-technology breakthrough to the realization of the envisioned technology.

Escritura de la propuesta: estructura de la parte B

Excellence

1.3 Objectives

•Describe the objectives of your proposed work. Are they concrete and plausible, measurable and verifiable? Are they realistically achievable within the duration of the project?

•Explain the appropriateness of the high-risk research approach for achieving the high gain objectives set in your project.

•Describe and explain the overall methodology, including the concepts, models and assumptions that underpin your work. Explain its suitability to deal with the considerable scientific and technological uncertainties of the project's objectives and how appropriate it is to enable alternative directions and options. Refer to any important challenges you may have identified in the chosen methodology and how you intend to overcome them.

•Describe how the gender dimension (i.e., sex and/or gender analysis) is considered in the project's research and innovation content. If you do not consider such a gender dimension to be relevant in your project, please provide a justification.

•Describe how appropriate open science practices are implemented as an integral part of the proposed methodology. Show how the choice of practices and their implementation are adapted to the nature of your work, in a way that will increase the chances of the project delivering on its objectives. If you believe that none of these practices are appropriate for your project, please provide a justification here.

•Research data management and management of other research outputs: Applicants generating/collecting data and/or other research outputs (except for publications) during the project must provide a short description on how the data/ research outputs will be managed in line with the FAIR principles (Findable, Accessible, Interoperable, Reusable).

Escritura de la propuesta: estructura de la parte B

Excellence

1.4 Interdisciplinarity

- Describe the proposed interdisciplinary approach engaging contributions from different scientific and technological disciplines.

- Explain to what extent the combination of disciplines brings new scientific collaborations and how it contributes to the achievement of the proposed breakthrough.

Escritura de la propuesta: estructura de la parte B

2.**Impact**

2.1 Long-term impact

•Provide a narrative explaining how the project's results are expected to make a difference in terms of impact, beyond the immediate scope and duration of the project. The narrative should include the components below, tailored to your project:

(a)Describe the transformative positive effects that the envisioned new technology, if achieved in the long term, would have on our economy, environment and society. How significant these transformative effects are?

(b)Describe any requirements and potential barriers - arising from factors beyond the scope and duration of the project - that may determine whether the desired outcomes and impacts are achieved. These may include, for example, other R&I work within and beyond Horizon Europe; regulatory environment; targeted markets; user behaviour. Indicate if these factors might evolve over time. Describe any mitigating measures you propose, within or beyond your project, that could be needed should your assumptions prove to be wrong, or to address identified barriers.

Escritura de la propuesta: estructura de la parte B

2.**Impact**

2.2 Innovation potential

•Describe the exploitation measures to facilitate future translation of research results into innovations.

•Specify your strategy for the management of intellectual property, foreseen protection measures, such as patents, design rights, copyright, trade secrets, etc. How adequate are they to support exploitation?

•Explain the measures the consortium will implement for involving and empowering key actors (such as excellent early-career researchers or promising high-tech SMEs, including start-ups) that have the potential to take the lead in translating research into innovations.

2.3 Communication and dissemination

•Describe the dissemination and communication measures that are planned, and the target group(s) addressed (e.g., scientific community, end users, financial actors, public at large) for raising awareness about the project's outcomes.

Escritura de la propuesta: estructura de la parte B

3. Quality and efficiency of the implementation

3.1 Quality of the consortium

- Describe the expertise of the consortium members. Explain how it provides all the necessary knowledge, how it supports the proposed interdisciplinary approach, and how it matches the project's objectives and tasks. Explain the role of each consortium member and its complementary contribution. If appropriate, show how this includes expertise in social sciences and humanities, open science practices, and gender aspects of R&I.

- Describe how the partners will have access to critical infrastructure needed to carry out the project activities.

- **Other countries and international organisations**: If one or more of the participants requesting EU funding is based in a country or is an international organisation that is not automatically eligible for such funding (entities from Member States of the EU, from Associated Countries and from one of the countries in the exhaustive list included in Annex 3 of the EIC Work Programme are automatically eligible for EU funding), explain why the participation of the entity in question is essential to successfully carry out the project.

Escritura de la propuesta: estructura de la parte B

3.**Quality and efficiency of the implementation**

3.2 Work plan and allocation of resources

Please provide the following:

- brief presentation of the overall structure of the work plan;
- timing of the different work packages and their components (Gantt chart or similar);
- graphical presentation of the components showing how they inter-relate (Pert chart or similar).
- detailed work description, i.e.:
  - a list of work packages (table 3.2a);
  - a description of each work package (table 3.2b);
  - a list of deliverables (table 3.2c);

Escritura de la propuesta: estructura de la parte B

3.**Quality and efficiency of the implementation**

3.2 Work plan and allocation of resources

- a list of milestones (table 3.2d);
- a list of critical risks, relating to project implementation, that the stated project's objectives may not be achieved. Detail any risk mitigation measures. You will be able to update the list of critical risks and mitigation measures as the project progresses (table 3.2e);
- a table showing number of person months required (table 3.2f);
- a table showing description and justification of subcontracting costs for each participant (table 3.2g);
- a table showing justifications for ‘purchase costs’ (table 3.2h) for participants where those costs exceed 15% of the personnel costs (according to the budget table in proposal part A);
- if applicable, a table showing justifications for ‘other costs categories’ (table 3.2i);
- if applicable, a table showing in-kind contributions from third parties (table 3.2j)

BUDGET ELIGIBLE COSTS – up to 10 millon euros (approx. 5 M € per project)

Research and innovation action (RIA) : up to **100%** of the eligible costs
(profit and non-profit legal entities).

Main differences with the other pilar II programme - RIA

Number of pages 50

EXCELENCE

- **Importance on the feedstock origins** food first principle
- **Do not significant harm principles**
- **Assessment of the environmental performance**
  - Identification of the environmental critical issues
  - *Ex-ante* estimation of the environmental sustainability performance (LCA)

IMPACT

- **Present a business model (preliminar idea)**

OTHER

BIC certificates are not requiered

Take into consideration the SIRA

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Circular Bio-based Europe Joint Undertaking

Bio-based Industries Consortium

Co-funded by the European Union

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