

# 5B POLYMERS

**Synthesis of Bio-based and Biodegradable polymers from monomers from renewable Biowastes via Biocatalysis and green chemistry to contribute to the European circular Bioeconomy**



Funded by the European Union



The project 101157840 — Polymers-5B — HORIZON-JU-CBE-2023 is funded by the European Union and supported by the Circular Bio-based Europe Joint Undertaking and its members.



## Key features of the POLYMERS-5B project



Developing novel alternative of bio-based polymers synthesised from bio-renewable monomers.



Consortium of 13 partners led by IST-ID with the Institute for Bioengineering and Biosciences – iBB.



Use of food side streams, wood processing residues as a feedstock.



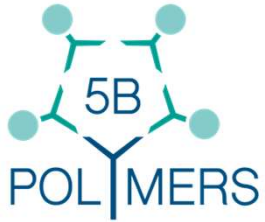
Biocatalysis and Green Chemistry, combined with AI and Machine Learning tools.



The bio-based polymers deliver solutions for textile, automotive, furniture, and polymeric resin markets.



Unlocking a wider range of bio-based products that meet market demands.



## About the project



### **CBE JU contribution:**

€ 5,264.779

### **Duration:**

June 2024 – May 2028

### **Feedstock:**

Food industry side streams  
and Lignin & wood residues

**Main products:** bio-based  
polymers & plastics.



POLYMERS-5B allows for more bio-based products, meeting what the market needs. This will help change the European plastics industry into a strong bio-based system.



For the textile industry, POLYMERS-5B offers significant advantages over standard methods, contributing to improved sustainability, safety, and circularity. This is why we recently joined the ECOSYSTEMEX community.

# 5B POLYMERS

Project partners →

→ Project lead:  
IST-ID (PT)

6 RTOs  
and 1 HES

4 SMEs

2 Large  
Companies



**BOBO CHOSES**

**eurecat**

**ISO CTAG**  
automotive technologies

**IBER-OLEFF**

**Centimfe**  
Technological Center for the Mouldmaking,  
Special Tooling and Plastic Industries

**ISTID**  
**iBB** Institute for  
Bioengineering  
and Biosciences

**idener.ai**

**LI**  
LATVIAN STATE  
INSTITUTE OF  
WOOD CHEMISTRY

**ChiraVision**  
innovative biocatalysis!

**MAX-PLANCK-INSTITUT  
FÜR POLYMERFORSCHUNG**

**FT**  
FACULTY OF  
TECHNOLOGY  
NOVI SAD

**Bonlex Europe**

**NSB  
project**

PARTNERS

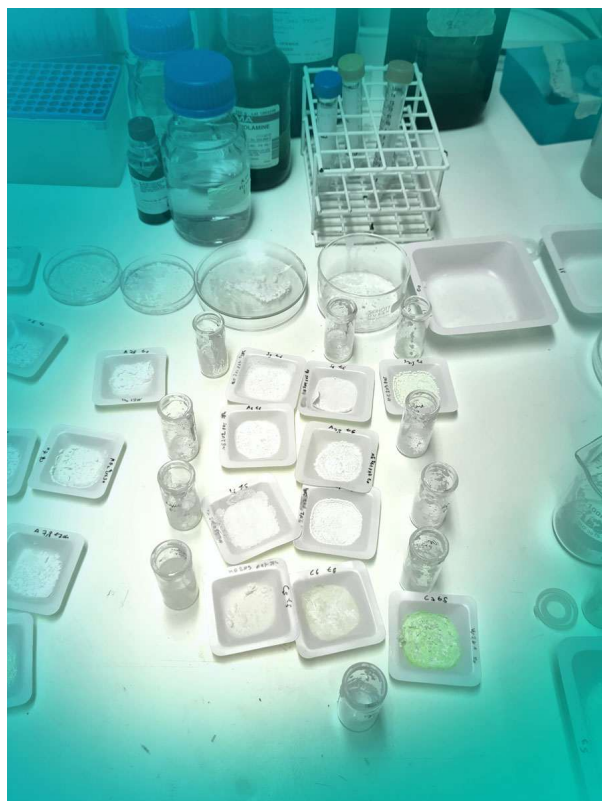
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**Circular  
Bio-based  
Europe**  
Joint Undertaking

**ECOSYSTEM**  
Member Project

**Bio based Industries  
Consortium**



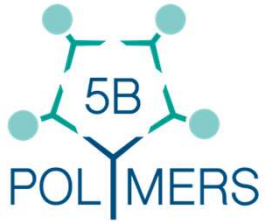
## Context and objectives

Novel alternative bio-based polymers synthesized from bio-renewable monomers sourced from underexploited 2G feedstock, using Machine Learning (ML) tools and Safe and Sustainable by Design (SSbD) approaches.



## Context and objectives

Biocatalysis and Green Chemistry processes to generate novel bio-based polymers targeting improved biodegradability in textile, automotive, furniture and polymeric resin markets.



# The POLYMERS-5B concept



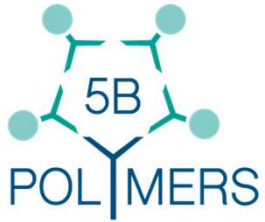
## Feedstock:

### *Underexploited 2nd Generation Biomass*

- Agri-food waste (Tomato & Olive wastes)
- Wood pulp & Lignin derivatives

## Processes & Technologies: *Biocatalysis and Green Chemistry*





# The POLYMERS-5B concept



## Intermediate outputs:

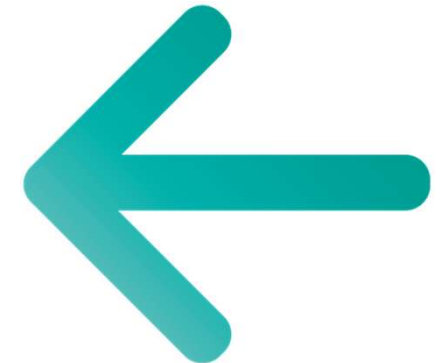
### *Bio-based monomers*

Diacids, diols, diamines, hydroxyacids, amino acids, aromatic & phenolic compounds, fatty acids, oils, furans.

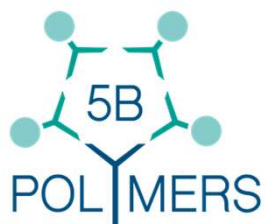
## Final products:

### *Novel bio-based Polymers with functional groups*

- Polyesters & Polyamides
- Polyphenols & mimic properties of other fossil-based polymers (e.g., PET, PUs, ABS)
- Bio-composites & Polymeric Materials



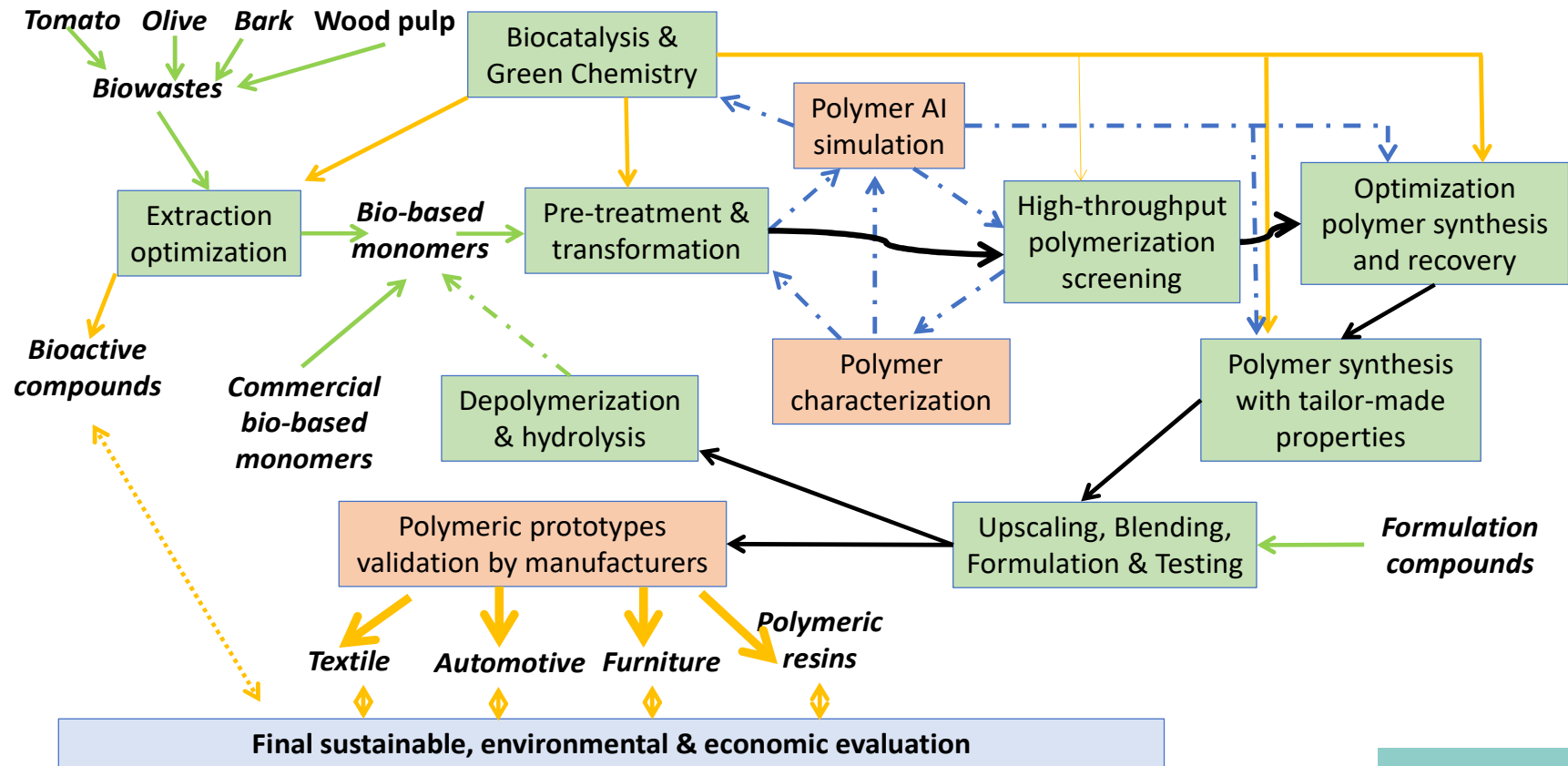


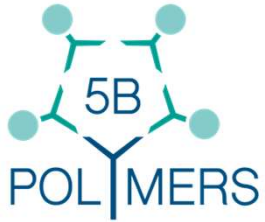


## The POLYMERS-5B concept

### Industries and Applications:

- Textiles: Biodegradable fabrics for clothing, etc.
- Automotive: Sustainable components for car interiors, etc.
- Furniture: Biodegradable furniture components, etc.
- Polymeric Resins: Sustainable resins for various industrial applications.





## Benefits to society and the environment



**Recyclability of new bio-based products**



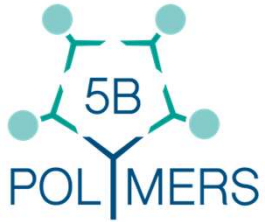
**Biodegradability, lower carbon footprint of the new products**



**Fair transition towards sustainability for all EU's citizens**



**Boosting the demand for new bio-polymers, products & bioactive compounds and creating the conditions for a spin-off**



# POLYMERS-5B technology

Luis Fonseca

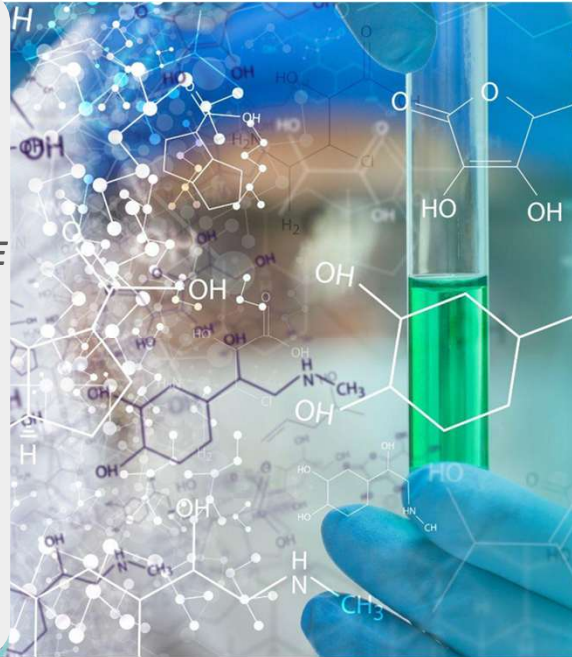
Instituto Superior Técnico (IST)  
Lisbon University,  
Lisbon (PT)

*Department of BioEngineering – DBE*

Institute for Bioengineering and  
Biosciences – iBB

Polymers-5B

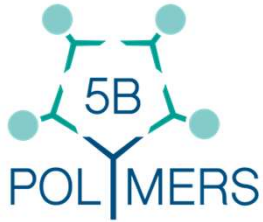
Biocatalysis and Biotransformation  
Research Group ≥



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TECNOLOGY



# Tips and Tricks for Coordinators

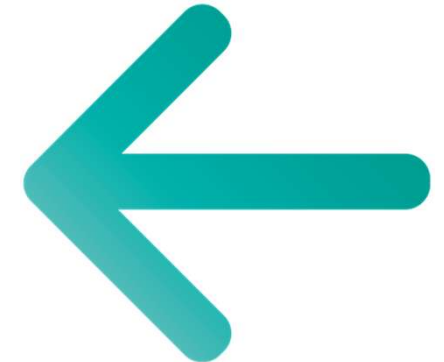
## Consortium Building Phase

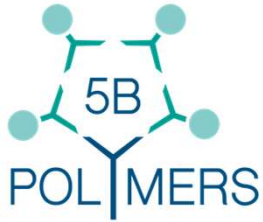


- **Start early:** Building a strong consortium takes time. Begin networking and identifying potential partners well in advance of the call deadline.
- **Define clear roles and responsibilities:** Ensure each partner understands their role and contribution to the project.
- **Seek complementary expertise:** Look for partners with diverse skills and knowledge that complement each other and strengthen the consortium as a whole.

### Additional tips:

- **Attend CBE JU National info days and workshops:** These events provide valuable insights into the AWP 2025.
- **CBE JU Info Day & networking platform:** Take advantage of this networking opportunity! Our coordinator has found relevant partners to finalize the Polymers-5B consortium!





# Tips and Tricks for Coordinators

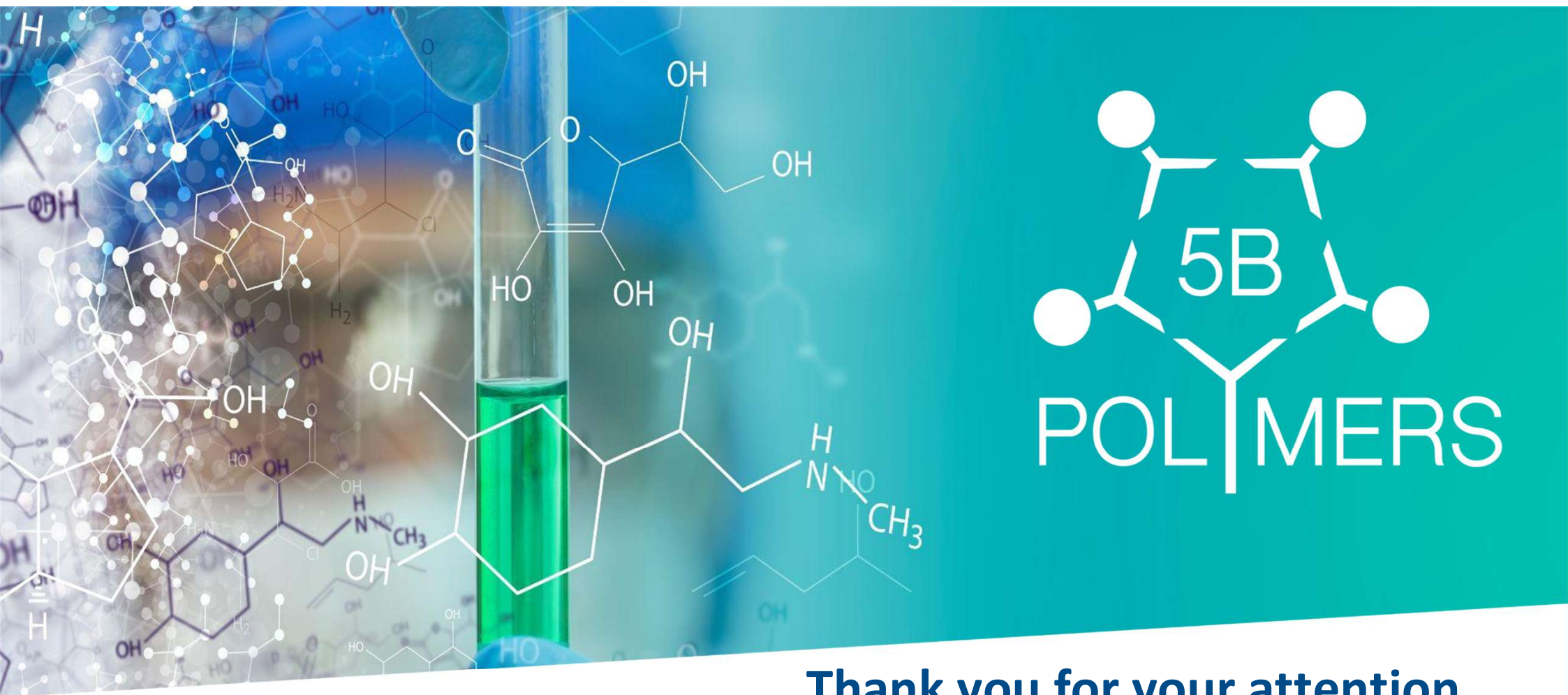
## Proposal Preparation Phase



- **Thoroughly read the call text:** Understand the specific objectives, requirements, and evaluation criteria of the call.
- **Develop a compelling project idea:** The project idea should be innovative, relevant, and aligned with the call's objectives.
- **Structure the proposal clearly:** Use a logical structure and clear language to present the project's objectives, methodology, and expected impact.
- **Address all evaluation criteria:** Ensure the proposal addresses all the evaluation criteria outlined in the call text.
- **Provide evidence of excellence:** Showcase the consortium's expertise and track record in the relevant field.
- **Demonstrate impact:** Clearly articulate the project's potential impact on society, the economy, and/or science.

Additional tips:

**Consult with CARE4BIO > National Contact Points (NCPs):** NCPs provide guidance and support to applicants throughout the proposal preparation process.



**Thank you for your attention**

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