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A research project funded under the EU H2020 programme, developing enzymes for environmental-friendly products

Welcome from the OXIPRO Project Coordinator, Dr. Gro Bjerga

### Welcome to our 3rd Newsletter

This latest edition of OXIPRO's Newsletter, brings you up-to-date news on key developments from our project and beyond.

OXIPRO's research developments are going from strength to strength in this phase of our project, and so we hope you find this issue of interest and we [welcome your feedback](#).



We also invite you to collaborate with us: to create change and to shape OXIPRO's developments and the future of enzyme applications. How can you do this? Simply [register via our website](#) to stay up-to-date with our activities and to take part in our events.

## News Summary

In recent developments, the European Commission has been working on a [revision for its REACH regulation on chemicals](#), which was expected by the end of this year. Last week, however, there appeared to be a delay as the EC's new vice-president of the EU's environmental policies, Maroš Šefčovič, stated that it would be tabled "when it's ready" ([see article](#)), prompting speculation it has been shelved.

Meanwhile, the EC has initiated a '[safe and sustainable by design](#)' (SSbD) framework to guide the innovation process for chemicals and materials. OXIPRO partners are working on the implications of these initiatives and are following the developments closely.



In other news, enzyme optimisation by engineering, an approach OXIPRO is undertaking for many of its enzymes, is contributing to a more sustainable and cleaner future. Last week, a comparison of **optimised PET degradation enzymes** for biorecycling of plastic and textiles was reported [here](#). In addition to outlining a standardised method for testing such enzymes, this development shows promising results. Through research and development, performance has been optimized to generate more efficient enzymes that may in future be used for **end-of-life management in PET biorecycling plants**.

News from our project partners include the announcement of a breakthrough in [enzyme immobilization for textile bleaching and laundry](#), enhancing the performance of peroxide generation close to the fabric during a laundry cycle.

It is evident now that enzymatic treatments have gained popularity in the textile industry as environmentally friendly and energy conserving alternatives.



In further updates, we are [opening the door to using fish proteins](#) in protein shakes and meal replacements by the application of OXIPRO's tailored enzymes. By finding and developing enzymes with specific properties that enable by-products from fish farming and fisheries to be utilized in a better way, biotechnologists are helping reduce biomass waste and supporting a circular economy.



OXIPRO partners continue to share our [automated enzyme engineering approaches](#) and [new enzyme discoveries](#) with the community for others to work on greener processes and products for the world.

And now for the rest of the news....

## Research Highlights

### New RUG Publication: Discovery and structural characterization of a thermostable bacterial monoamine oxidase

In a significant research development, the [OXIPRO team at the University of Groningen \(RUG\)](#) has recently managed to quickly produce and test such oxidative biocatalysts. Taking advantage of this, the team, led by [Marco Fraaije](#), has discovered a monoamine oxidase (MAO) that is very robust, and active on a range of amines.

[Read on...](#)

### Universitat Autònoma de Barcelona Announces Breakthrough in Enzyme Immobilisation for Textile Bleaching and Laundry

The OXIPRO team at the Universitat Autònoma de Barcelona ([UAB](#)) have identified a carbohydrate binding module in the CBM3 family as a very good candidate for improving the immobilization properties of NAG oxidase when fused together in the OXIPRO [Textile Innovation Case](#).

[Read on...](#)

### Tailored enzymes open new possibilities for improving the smell of fish protein powders

In a new study, NORCE researchers show that a chemical which causes fish protein powder to smell fishy can be removed, opening the door to using these proteins in protein shakes and meal replacements.

"Our ambition is to design an enzyme process which seafood producers can use to make their business more profitable, and to keep as much of the biomass as possible food-grade, says researcher Rasmus Ree at NORCE".

[Read on...](#)

## From Spain across to Japan - OXIPRO Partners Take Part in Global Events

- OXIPRO partners [GECCO](#) and [CALYXIA](#) are getting geared up for engagement at **high-profile events taking place this Autumn in Spain and Germany**. [Read on...](#)
- OXIPRO partner **Barcelona Supercomputing Centre (BSC)**, together with its spinoff [Nostrum Biodiscovery](#), have just co-hosted an **exhibition stand and presented** at [BioJapan](#) (October 11th-13th 2023), having recently returned from [BioSpain](#), where they presented the OXIPRO project and its transformative developments. [Read on...](#)
- [GECCO](#) and [University of Groningen \(RUG\)](#) were both present in full force at the high-profile **Netherlands Biotechnology Congress (NBC)** held on 29 September 2023 at Corpus Conference Centre in Oegstgeest. **Lars Santema** – a member of [Marco Fraaije's Group at RUG](#) – successfully delivered a pitch talk on his poster and **won the poster pitch award**. [Read on...](#)

- OXIPRO partner [BSC](#) has delivered its first **workshop on Computational Enzyme Bioprospecting and Engineering**, organized alongside sister project [FuturEnzyme](#). The event provided a comprehensive overview of the principles and techniques used in this exciting field, including the latest advancements and techniques in **protein engineering using computational methods such as bioprospecting, molecular simulations, and artificial intelligence**. [Read on...](#)
- The OXIPRO project consortium recently gathered in Barcelona, Spain, for the **annual project meeting**. Hosted close to the largest football stadium in Europe, Camp Nou, the event enabled project partners to **'keep their eyes on the ball', share ongoing work and recent highlights** and **'set a game plan'** for future work. Our next meeting will be in Athens in June 2024, hosted by our partner [Rolco](#). [Read on...](#)



## Translating Science into Policy - addressing EC REACH amendments

A significant outcome of our work is the translation of research output into evidence-based recommendations for policymakers.

Our first Policy Brief, formulated together with our sister projects, described how enzyme solutions in targeted consumer sectors can significantly reduce greenhouse gases and increase product sustainability.

You can [read more about it](#) and download it [here](#).



The next Policy Brief, which is currently underway, will look at the EC proposal to amend the REACH Regulation to extend the use of the generic risk assessment (GRA) approach (i.e., [restrictions under Art. 68 \(2\) of REACH](#)) to respiratory sensitizers in consumer and professional uses.

This raises major concerns for the enzyme sector. Given these regulatory challenges, OXIPRO partners and our sister projects will be reinforcing our outreach to decision-makers and stakeholders to emphasise the importance and added value of enzymes in an EU bio-based and sustainable economy. We will soon be holding an internal workshop to focus on this topic.

## Behind the Scenes at OXIPRO

There is a beehive of activity across multidisciplinary teams from 15 organisations across Europe, all closely working together. Periodically, we profile our partner organisations on our [website news page](#).

Here we bring you the most recent profiles from our pages:

- [Calyxia](#): **Enhancing Enzyme Application with Eco-friendly Technology**

- **Taking Textiles to a Whole New Sustainable Level – [Meet Zorluteks](#)**
- **Introducing the OXIPRO Team at [GECCO](#)**
- **Meet the OXIPRO Partners at [UAB](#)**
- **Introducing our Partners: [VTT Finland](#)**
- **Spotlight on the [University of Groningen](#): Supporting our Early Career Researchers**

## Collaborating with our Sister Projects

OXIPRO partners continue to work closely with partners in our three sister projects to tackle common problems and contribute to the call's expected outcomes. **Our sister projects are:**

- [EnXylaScope](#)
- [FuturEnzyme](#)
- [Radicalz](#)



Find out more about the recent output from our enzyme cluster's joint undertakings:

- [Enzyme Cluster Projects Present Innovations in Enzyme Research in Europe.](#)
- [Enzyme Cluster Projects Review the Consequences of Climate Change and How Enzymes Can Counteract](#)

You can also read more about our activities and developments in our joint newsletter - **The Active Site**

- [Latest edition the Enzyme Cluster's Joint Newsletter \*\*The Active Site #6\*\*](#)
- [Subscribe to The Active Site](#)

## And finally...

We hope you've found this issue of OXIPRO'S news of interest.

Please [register via our website](#) to stay up to date with our developments and to take part in our events.

We hold stakeholder consultations with representatives from different fields who assist us in filling knowledge gaps and identifying requirements.

If you want to know how we engage those interested in OXIPRO, we've taken a "scientific approach" and [published our guide](#) on how to develop a stakeholder engagement plan.



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## About OXIPRO

OXIPRO is a four-year initiative funded under the EU's Horizon 2020 programme and brings together a multidisciplinary team of researchers and stakeholders from 15 entities across Europe to focus on the development of novel enzymes for environment-friendly consumer products.

The OXIPRO partners are developing and deploying an efficient oxidoreductase foundry using cutting-edge bioinformatics and biotechnology, and by broadening the range of industrial oxidoreductases for more sustainable processes, this initiative will ultimately contribute to the transition to environment-friendly products, with detergents, textiles, sunscreens, and nutraceuticals.

Through the integration of computational workflows and state-of-the-art biotechnological technologies, OXIPRO will expedite the lab to market journey, while shortcutting downstream implementation and ensuring market uptake. This will be supported by ecosystem intelligence generated throughout the

project as well as engagement with research, policy, societal and industrial actors in co-creation and interactions to maximise output and enable faster and systemic innovations.

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To join the OXIPRO Community and receive project updates, [please register here](#)

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