

HORIZON
2020

New enzymatic oxidation/oxyfunctionalization technologies for added value bio-based products

Fact Sheet

Project Information

EnzOx2

Grant agreement ID: 720297

[Project website](#) 

DOI

[10.3030/720297](https://doi.org/10.3030/720297) 

Project closed

EC signature date

27 July 2016

Start date

1 November 2016

End date

31 October 2019

Funded under

SOCIETAL CHALLENGES - Food security, sustainable agriculture and forestry, marine, maritime and inland water research, and the bioeconomy

Total cost

€ 5 000 000,00

EU contribution

€ 3 000 000,00

Coordinated by

AGENCIA ESTATAL CONSEJO
SUPERIOR DE
INVESTIGACIONES CIENTIFICAS



Spain

Objective

Sustainable production of chemical building blocks and other added value products from plant biomass is required for a bio-based economy. However, the biomass biorefineries should benefit not only from the use of renewable feedstocks but also from greener and more efficient bio-chemical technologies. Previous projects have

shown the potential of oxidative enzymes in the production of some added value compounds from biomass components. Of special interest are still unexplored oxidation/oxyfunctionalization reactions (of sugar and lipid compounds) by microbial oxidoreductases, including new (self-sufficient) heme-thiolate peroxygenases. In this context, EnzOx2 plans to develop a 100% biochemical conversion of bio-based 5-hydroxymethylfurfural (HMF) into diformylfuran, a platform chemical, and 2,5-furandicarboxylic acid (FDCA), a plastic building-block. Oxidases (flavo and copper/radical) and peroxygenases will be used to perform the three-step oxidation of HMF to FDCA in a co-substrate and side-product free, one-pot conversion. On the other hand, highly (regio/stereo) selective hydroxylation of plant lipids (such as fatty acids, terpenes and steroids) by peroxygenases will be optimized for cost-effective production of flavours and fragrances (F&F), active pharmaceutical ingredients (APIs) and others. ENZO2 aims to solve some main bottlenecks in these industrial processes by the use of bio-chemical tools (new/engineered enzymes and optimized biotransformations), to be later validated at the pilot/flagship scale. To attain this objective the consortium includes: i) two world leaders in industrial enzymes (Novozymes) and F&F (Firmenich); ii) two chemical SMEs producing HMF and chiral APIs (AVA-Biochem and Chiracon); iii) two specialized biotechnology SMEs (JenaBios and CLEA); iv) one technology centre in the Plastics sector (AIMPLAS); and v) three CSIC institutes and two universities (Dresden and Delft) with expertise in enzyme reactions and bioprocess implementation.

Fields of science (EuroSciVoc)

[natural sciences](#) > [chemical sciences](#) > [electrochemistry](#) > **[electrolysis](#)**

[natural sciences](#) > [biological sciences](#) > [biochemistry](#) > [biomolecules](#) > **[lipids](#)**

[natural sciences](#) > [chemical sciences](#) > [catalysis](#) > **[biocatalysis](#)**

[natural sciences](#) > [biological sciences](#) > [genetics](#) > **[genomes](#)**

[natural sciences](#) > [biological sciences](#) > [biochemistry](#) > [biomolecules](#) > [proteins](#) > **[enzymes](#)**



Programme(s)

[H2020-EU.3.2. - SOCIETAL CHALLENGES - Food security, sustainable agriculture and forestry, marine, maritime and inland water research, and the bioeconomy](#)

MAIN PROGRAMME

[H2020-EU.3.2.6. - Bio-based Industries Joint Technology Initiative \(BBI-JTI\)](#)

Topic(s)

Call for proposal

[H2020-BBI-PPP-2015-02](#) 

[See other projects for this call](#)

Sub call

H2020-BBI-PPP-2015-2-1

Funding Scheme

[BBI-RIA - Bio-based Industries Research and Innovation action](#)

Coordinator



AGENCIA ESTATAL CONSEJO SUPERIOR DE INVESTIGACIONES CIENTIFICAS

Net EU contribution

€ 1 306 000,00

Total cost

€ 1 814 000,00

Address

CALLE SERRANO 117

28006 Madrid

 **Spain** 

Region

Comunidad de Madrid > Comunidad de Madrid > Madrid

Activity type

Research Organisations

Links

[Contact the organisation](#)  [Website](#) 

[Participation in EU R&I programmes](#) 

[HORIZON collaboration network](#) 

Participants (12)



TECHNISCHE UNIVERSITAET DRESDEN

Germany

Net EU contribution

€ 450 000,00

Address

HELMHOLTZSTRASSE 10

01069 Dresden

Region

Sachsen > Dresden > Dresden, Kreisfreie Stadt

Activity type

Higher or Secondary Education Establishments

Links

[Contact the organisation](#) [Website](#)

[Participation in EU R&I programmes](#)

[HORIZON collaboration network](#)

Total cost

€ 600 000,00



JENABIOS GMBH

Germany

Net EU contribution

€ 244 000,00

Address

LOBSTEDTER STRASSE 80

07749 Jena

SME

Yes

Region

Thüringen > Thüringen > Jena, Kreisfreie Stadt

Activity type

Private for-profit entities (excluding Higher or Secondary Education Establishments)

Links

[Contact the organisation](#) [Website](#)

[Participation in EU R&I programmes](#)

Total cost

€ 325 000,00



FIRMENICH SA

 Switzerland

Net EU contribution

€ 0,00

Address

ROUTE DES JEUNES 1

1227 Geneve 

Region

Schweiz/Suisse/Svizzera > Région lémanique > Genève

Activity type

Private for-profit entities (excluding Higher or Secondary Education Establishments)

Links

[Contact the organisation](#)  [Website](#) 

[Participation in EU R&I programmes](#) 

[HORIZON collaboration network](#) 

Total cost

€ 118 750,00



AVA BIOCHEM BSL AG

 Switzerland

Net EU contribution

€ 0,00

Address

ROTHAUSSTRASSE 61

4132 Muttenz 

SME 

Yes

Region

Schweiz/Suisse/Svizzera > Nordwestschweiz > Basel-Landschaft

Activity type

Private for-profit entities (excluding Higher or Secondary Education Establishments)

Links

- Contact the organisation Website
- Participation in EU R&I programmes
- HORIZON collaboration network

Total cost

€ 609 000,00

THIRD-PARTY

AVALON INDUSTRIES AG

Switzerland

Net EU contribution

€ 0,00

Address

BAARERSTRASSE 20
6300 ZUG

Region

Schweiz/Suisse/Svizzera > Zentralschweiz > Zug

Activity type

Private for-profit entities (excluding Higher or Secondary Education Establishments)

Links

- Contact the organisation
- Participation in EU R&I programmes
- HORIZON collaboration network

Total cost

€ 100 000,00

THIRD-PARTY

AVA CO2 SCHWEIZ AG

Switzerland

Net EU contribution

€ 0,00

Address

BAARERSTRASSE 20
6300 ZUG

SME

Yes

Region

Schweiz/Suisse/Svizzera > Zentralschweiz > Zug

Activity type

Private for-profit entities (excluding Higher or Secondary Education Establishments)

Links

- Contact the organisation
- Participation in EU R&I programmes
- HORIZON collaboration network

Total cost

No data



NOVOZYMES A/S

Denmark

Net EU contribution

€ 0,00

Address

Krogshoejvej 36
2880 Bagsvaerd



Region

Danmark > Hovedstaden > Københavns omegn

Activity type

Private for-profit entities (excluding Higher or Secondary Education Establishments)

Links

- Contact the organisation
- Website
- Participation in EU R&I programmes
- HORIZON collaboration network

Total cost

€ 200 000,00



TECHNISCHE UNIVERSITEIT DELFT

Netherlands

Net EU contribution

€ 400 000,00

Address

STEVINWEG 1

2628 CN Delft 

Activity type

Higher or Secondary Education Establishments

Links

[Contact the organisation](#)  [Website](#) 

[Participation in EU R&I programmes](#) 

[HORIZON collaboration network](#) 

Total cost

€ 533 000,00



CHIRACON GMBH

 Germany

Net EU contribution

€ 250 000,00

Address

BIOTECHNOLOGIEPARK TGZ 1

14943 Luckenwalde 

SME 

Yes

Region

Brandenburg > Brandenburg > Teltow-Fläming

Activity type

Private for-profit entities (excluding Higher or Secondary Education Establishments)

Links

[Contact the organisation](#)  [Website](#) 

[Participation in EU R&I programmes](#) 

[HORIZON collaboration network](#) 

Total cost

€ 333 000,00



CLEA TECHNOLOGIES BV 

 Netherlands

Net EU contribution

€ 0,00

Address

DELFTECHPARK 34
2628 XH Delft 

SME 

Yes

Region

West-Nederland > Zuid-Holland > Delft en Westland

Activity type

Private for-profit entities (excluding Higher or Secondary Education Establishments)

Links

[Contact the organisation](#)  [Website](#) 

[Participation in EU R&I programmes](#) 

[HORIZON collaboration network](#) 

Total cost

No data



AIMPLAS - ASOCIACION DE INVESTIGACION DE MATERIALES PLASTICOS Y CONEXAS

 Spain

Net EU contribution

€ 150 000,00

Address

VALENCIA PARC TECHNOLOGIC CALLE GUSTAVE EIFFEL 4
46980 Paterna 

SME 

Yes

Region

Este > Comunitat Valenciana > Valencia/València

Activity type

Research Organisations

Links

[Contact the organisation](#)  [Website](#) 

[Participation in EU R&I programmes](#) 

[HORIZON collaboration network](#) 

Total cost
€ 200 000,00



UNIVERSIDAD DE SANTIAGO DE COMPOSTELA

 Spain

Net EU contribution

€ 200 000,00

Address

COLEXIO DE SAN XEROME PRAZA DO OBRADOIRO S/N
15782 Santiago De Compostela 

Region

Noroeste > Galicia > A Coruña

Activity type

Higher or Secondary Education Establishments

Links

[Contact the organisation](#)  [Website](#) 

[Participation in EU R&I programmes](#) 

[HORIZON collaboration network](#) 

Total cost
€ 267 250,00

Last update: 17 August 2022

Permalink: <https://cordis.europa.eu/project/id/720297>

European Union, 2025