

HORIZON
2020

Sustainable industrial processes based on a C-C bond-forming enzyme platform

Fact Sheet

Project Information

CARBAZYMES

Grant agreement ID: 635595

[Project website](#) 

DOI

[10.3030/635595](https://doi.org/10.3030/635595) 

Project closed

EC signature date

13 March 2015

Start date

1 April 2015

End date

31 March 2019

Funded under

INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies – Biotechnology

Total cost

€ 9 251 355,00

EU contribution

€ 8 202 966,00

Coordinated by

TECHNISCHE UNIVERSITÄT
DARMSTADT

Germany

Objective

C-C bond forming reactions are at the heart of industrial organic synthesis, but remain largely unexplored due to long development timelines and the lack of broad biocatalytic reaction platforms. CARBAZYMES addresses these challenges by assembling an interdisciplinary and intersectoral consortium as a powerful synergistic tool to promote innovation in the field of biocatalytic C-C bond formation at large scale, and thus the global competitiveness of the European chemical and pharmaceutical industry. The proposed consortium, with 50% industrial participation, represents academia but also commercial interests in different stages of the research-to-market process. This top-down approach, together with a life-cycle

innovation approach ensures an industrial drive to the project.

Clearly aligned with the scope of topic BIOTEC3-2014, CARBAZYMES will pursue the biocatalytic synthesis (spanning TRLs 5-7) of 4 APIs and 3 bulk chemicals – corresponding to market needs detected by the industrial partners in the Consortium. This will be accomplished through an inter-disciplinary approach which includes: i) a broad platform of 4 types of unique C-C bond-forming enzymes, mostly lyases; ii) the capacity to rapidly evolve enzymes to operate under industrial conditions by means of novel enzyme panels and massive screening methods; iii) application of microreactor technology for bioprocess characterization; iv) demonstration actions comprising technical (up to 100L) and economic viability studies carried out by industrial partners.

CARBAZYMES unmistakably aims to have social and economic impact by addressing markets worth bn €, developing enzyme evolution technologies beyond the state of the art and creating qualified jobs and technical-scale facilities at the industrial partners' sites. CARBAZYMES will also achieve an environmental impact by enforcing that the developed processes replace more energy and resource intensive processes, thus leading to reduced environmental footprints.

Fields of science (EuroSciVoc)

[engineering and technology](#) > [mechanical engineering](#) > [manufacturing engineering](#)

[engineering and technology](#) > [environmental biotechnology](#) > [bioremediation](#) > [bioreactors](#)

[medical and health sciences](#) > [basic medicine](#) > [pharmacology and pharmacy](#) > [pharmaceutical drugs](#)

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

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



Keywords

[C-C bond forming enzymes](#)

[lyases](#)

[aldolases](#)

[halohydrin dehalogenases](#)

[enzyme engineering](#)

[enzyme panels](#)

[thermostabilization](#)

[microreactor](#)

[technical scale](#)

[cascade reactions](#)

[APIs](#)

[bulk chemicals](#)

Programme(s)

Topic(s)

[BIOTEC-3-2014 - Widening industrial application of enzymatic processes](#)

Call for proposal

[H2020-BIOTEC-2014-2015](#) 

[See other projects for this call](#)

Sub call

H2020-LEIT-BIO-2014-1

Funding Scheme

[IA - Innovation action](#)

Coordinator



TECHNISCHE UNIVERSITÄT DARMSTADT

Net EU contribution

€ 1 469 606,00

Total cost

€ 1 469 606,25

Address

KAROLINENPLATZ 5

64289 Darmstadt

 **Germany** 

Region

Hessen > Darmstadt > Darmstadt, Kreisfreie Stadt

Activity type

Higher or Secondary Education Establishments

Links

- [Contact the organisation](#)
- [Website](#)
- [Participation in EU R&I programmes](#)
- [HORIZON collaboration network](#)

Participants (14)



AGENCIA ESTATAL CONSEJO SUPERIOR DE INVESTIGACIONES CIENTIFICAS

Spain

Net EU contribution

€ 1 145 190,00

Address

CALLE SERRANO 117
28006 Madrid

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](#)

Total cost

€ 1 145 190,00



UNIVERSIDAD AUTONOMA DE MADRID

Spain

Net EU contribution

€ 786 375,00

Address

CALLE EINSTEIN 3 CIUDAD UNIV CANTOBLANCO RECTORADO
28049 Madrid

Region

Comunidad de Madrid > Comunidad de Madrid > Madrid

Activity type

Higher or Secondary Education Establishments

Links

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

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

[HORIZON collaboration network](#) 

Total cost

€ 786 375,00



TECHNISCHE UNIVERSITAET BRAUNSCHWEIG

 Germany

Net EU contribution

€ 677 018,00

Address

UNIVERSITAETSPLATZ 2
38106 Braunschweig 

Region

Niedersachsen > Braunschweig > Braunschweig, 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

€ 677 018,75



RIJKSUNIVERSITEIT GRONINGEN

 Netherlands

Net EU contribution

€ 726 452,00

Address

Broerstraat 5
9712CP Groningen 

Activity type

Higher or Secondary Education Establishments

Links

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

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

[HORIZON collaboration network](#) 

Total cost

€ 726 452,50



SVEUCILISTE U ZAGREBU FAKULTET KEMIJSKOG INZENJERSTVA I TEHNOLOGIJE

 Croatia

Net EU contribution

€ 544 260,00

Address

MARULICEV TRG 19

10000 Zagreb 

Region

Hrvatska > Grad Zagreb > Grad Zagreb

Activity type

Higher or Secondary Education Establishments

Links

[Contact the organisation](#) 

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

[HORIZON collaboration network](#) 

Total cost

€ 544 260,00



BIOCHEMIZE SL

 Spain

Net EU contribution

€ 207 987,00

Address

CARRER MARIE CURIE 8

08005 Barcelona 

SME 

Yes

Region

Este > Cataluña > Barcelona

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

€ 297 125,00



BIO-PRODIGT BV

 Netherlands

Net EU contribution

€ 463 736,00

Address

NIEUWE MARKTSTRAAT 54

6511 AA Nijmegen 

SME 

Yes

Region

Oost-Nederland > Gelderland > Arnhem/Nijmegen

Activity type

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

Links

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

[HORIZON collaboration network](#) 

Total cost

€ 662 481,25



SUSTAINABLE MOMENTUM SL

Spain

Net EU contribution

€ 109 200,00

Address

**AVDA ALCALDE JOSE RAMIREZ BETHENCOURT 17 PLANTA 6 PUERTA B
35004 Las Palmas De Gran Canaria**

SME

Yes

Region

Canarias > Canarias > Gran Canaria

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

€ 156 000,00



INSTITUT UNIV DE CIENCIA I TECNOLOGIA SA

Spain

Net EU contribution

€ 416 325,00

Address

**CALLE ALVAREZ DE CASTRO 63
08100 Mollet Del Valles**

SME

Yes

Region

Este > Catalunya > Barcelona

Links

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

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

Total cost

€ 596 750,00



ENZYMICALS AG

 Germany

Net EU contribution

€ 380 800,00

Address

WALTHER-RATHENAU-STRASSE 49A

17489 Greifswald 

SME 

Yes

Region

Mecklenburg-Vorpommern > Mecklenburg-Vorpommern > Vorpommern-Greifswald

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

€ 544 000,00



ALBERT-LUDWIGS-UNIVERSITAET FREIBURG

 Germany

Net EU contribution

€ 412 500,00

Address

FAHNENBERGPLATZ

79098 Freiburg 

Region

Baden-Württemberg > Freiburg > Freiburg im Breisgau, Stadtkreis

Activity type

Higher or Secondary Education Establishments

Links

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

Total cost

€ 412 500,00



PROZOMIX LIMITED

United Kingdom

Net EU contribution

€ 384 892,00

Address

STATION COURT 3
NE49 9HN Haltwhistle

SME

Yes

Region

North East (England) > Northumberland and Tyne and Wear > Northumberland

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

€ 549 846,25



EVONIK INDUSTRIES AG

Germany

Net EU contribution

€ 0,00

Address

RELLINGHAUSER STRASSE 1-11
45128 Essen 

Region

Nordrhein-Westfalen > Düsseldorf > Essen, Kreisfreie Stadt

Links

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

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

[HORIZON collaboration network](#) 

Total cost

No data



EVONIK OPERATIONS GMBH

 Germany

Net EU contribution

€ 478 625,00

Address

RELLINGHAUSER STRASSE 1-11
45128 Essen 

Region

Nordrhein-Westfalen > Düsseldorf > Essen, Kreisfreie Stadt

Activity type

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

Links

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Total cost

€ 683 750,00

Last update: 12 September 2023

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European Union, 2025

