

FuturEnzyme Technologies of the FUTURE for low-cost ENZYMES for environment-friendly products

24 M meeting

Hamburg, 06-07.07.2023



Project funded by the European Union's Horizon 2020
Research and Innovation Programme under grant agreement No [101000327]



Work packages description



WP Number ⁹	WP Title	Lead beneficiary ¹⁰	Person-months ¹¹	Start month ¹²	End month ¹³
WP1	Management and Coordination	1 - CSIC	58.00	1	48
WP2	Machine learning enzyme bio-prospecting integrated into an industrial context	2 - BSC	51.00	1	48
WP3	Activity-based bio-prospecting for enzymes	3 - BANGOR	75.00	1	36
WP4	Small-scale enzyme production and characterisation	4 - UHAM	173.00	1	40
WP5	Enhancing enzymes through innovative engineering	9 - FHNW	96.00	3	42
WP6	Development and supply of best enzyme prototypes	16 - EUCODIS	97.90	16	48
WP7	Formulation and manufacturing of consumer products: sustainability and environmental assessments	10 - CLIB	83.00	1	48
WP8	Communication, Dissemination and Exploitation	8 - ITB	70.57	1	48
WP9	Ethics requirements	1 - CSIC	N/A	1	48
Total			704.47		

Lead contact point

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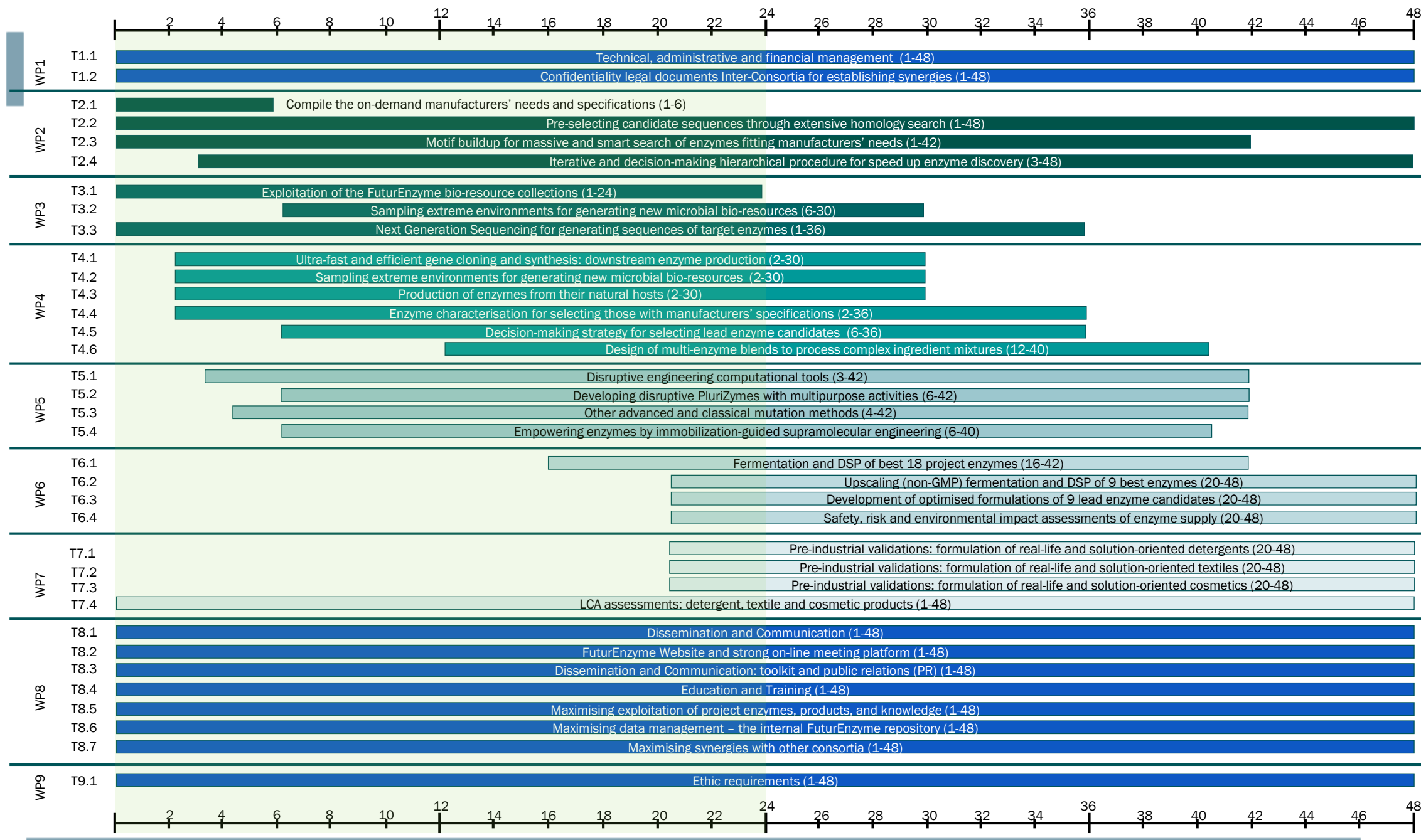
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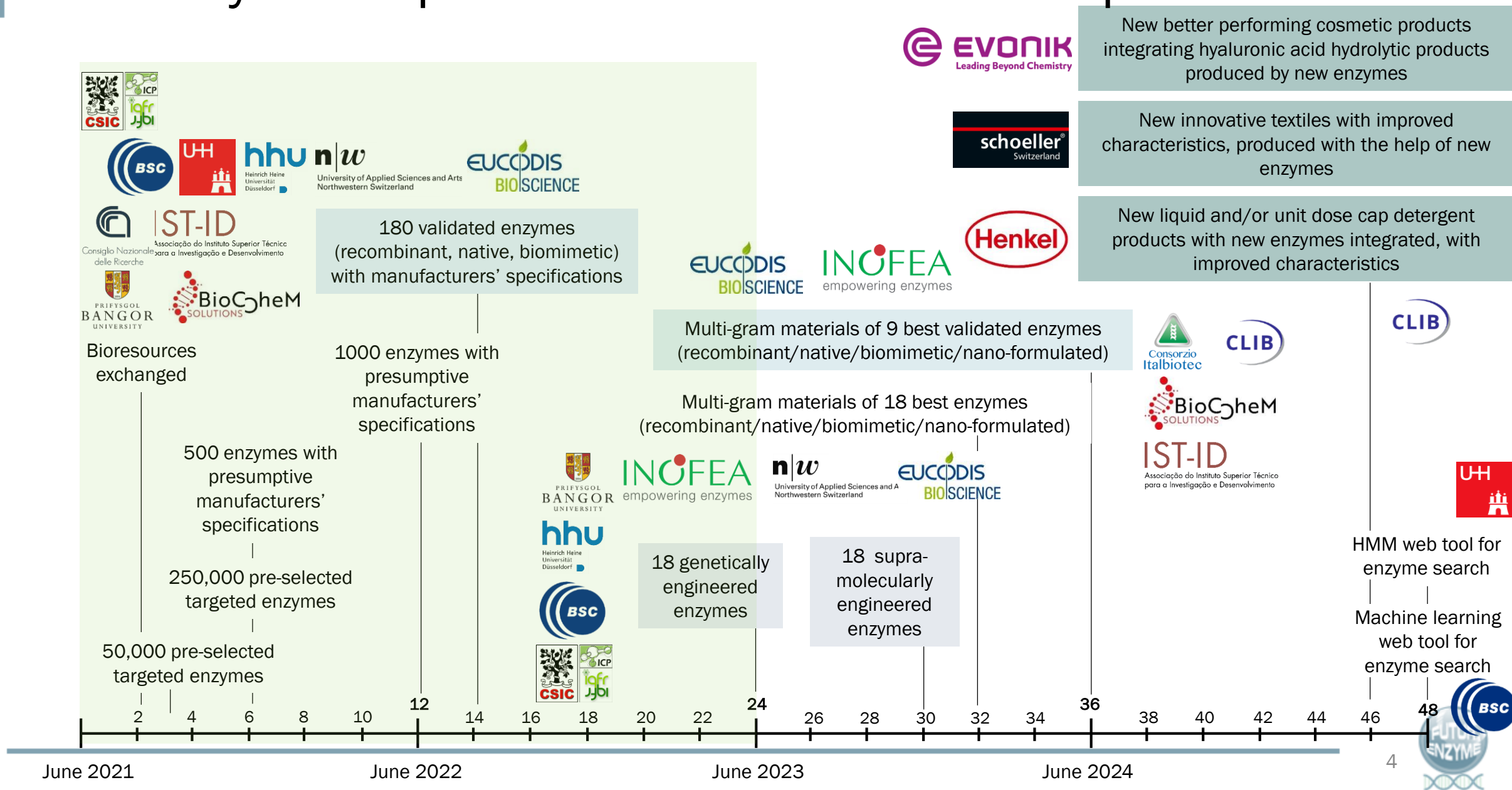
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FuturEnzyme: Important achievements to keep in mind





FuturEnzyme: Important achievements to keep in mind

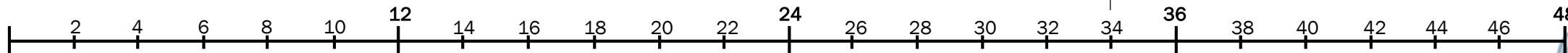


Report informing about the overall success of the new enzymes and enzymatic processes to produce environmentally-friendly consumer products and how they may help producing similar or other products with environmental benefits



Report describing how the integration of best 18 enzymes as ingredients or as parts of production processes result in greener, functional and sustainable products

Report informing about the economic feasibility and sustainability of the new enzyme supply system





WP1 - Managing and Coordination

■ OBJECTIVE

Management of the project; EC-contact/funding issues management; synergies with sister projects; communication with the Advisory Board (AB)

■ TASKS

- Technical, administrative and financial management (M1 - M48) (TASK 1.1)
- Confidentiality legal documents Inter-Consortia for establishing synergies (M1 - M48) (TASK 1.2)



■ WORK DONE

- **Project's organization and management** at all levels
- **Communication with the European Union** (Project Officers), **AB members** and the **3 sister projects**



Deliverables: 35 submitted, all at due time

- D4.4 delivered but reopened with the PO's consent (new due date month 30, November 2023)
- D8.12 delivered but reopened with the PO's consent (new due date month 26, July 2023)



Grant Management

Project Continuous Report



101000327 (FuturEnzyme) RIA
THE FRAMEWORK PROGRAMME FOR RESEARCH AND INNOVATION
HORIZON 2020
Call: H2020-FNR-2020
Topic: FNR-16-2020
Unit: REA/B/03

Summary for publication

Deliverables Ethics, DMP, Other Reports

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Critical Risks

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Disseminat... and Communic...

Intellectual property rights (IPR)

Innovation

SME Impact

Open Data

Gender


ABS Regulation

Deliverables, Ethics, DMP, Other Reports

 For each Deliverable, a single file (max 52MB) can be uploaded

 Show Filters  Clear Filters

 Deliverables

WP No	Del Rel. I	Del No	Title	Description	Lead B	Nature	Dissemin	Est. Del.	Rev. Due Dat	Receipt Date	Approval Date	Status	
WP3	D3.1	D12	Bio-resources prepared and e:	This deliverable will consist in a set of bio-r...	BANG	Other	Confidei	31 Jul 2021		27 Dec 202	17 Apr 2023	Approved	
WP3	D3.2	D13	Standard assays, analytics and	This deliverable will consist in a report detai...	UHAN	Report	Confidei	31 Jul 2021		27 Dec 202	17 Apr 2023	Approved	
WP8	D8.1	D43	FuturEnzyme website	This deliverable will consist in an open websit...	CSIC	Website	Public	31 Jul 2021		26 Jul 2021	17 Apr 2023	Approved	
WP2	D2.1	D6	Manufacturers' needs and spe	This deliverable will consist in a report conta...	CSIC	Report	Confidei	31 Aug 202		27 Dec 202	17 Apr 2023	Approved	
WP4	D4.1	D18	QR barcoding system, availab	To ensure the traceability of all materials and...	CSIC	Other	Confidei	31 Aug 202		06 Aug 202	17 Apr 2023	Approved	
WP8	D8.2	D44	Visual identity guidelines	This deliverable will consist in a series of vi...	CSIC	Website	Public	31 Aug 202		06 Aug 202	17 Apr 2023	Approved	
WP8	D8.3	D45	Plan for using, communication	This deliverable will consist in a report defin...	ITB	Report	Confidei	31 Aug 202		30 Jul 2021	17 Apr 2023	Approved	
WP8	D8.4	D46	Data Management Plan	This deliverable will describe the Data Managem...	CSIC	ORDP: C	Confidei	30 Sep 202		29 Sep 202	17 Apr 2023	Approved	
WP1	D1.1	D1	Project meetings and bodies c	This deliverable will consist in a report summa...	CSIC	Report	Confidei	30 Nov 202		26 Nov 202	17 Apr 2023	Approved	
WP2	D2.2	D7	Set of 250,000 sequences pre	This deliverable will consist in a fasta file c...	CSIC	Other	Confidei	30 Nov 202		27 Dec 202	17 Apr 2023	Approved	
WP8	D8.5	D47	FuturEnzyme repository for d	This deliverable will consist in an internal re...	BSC	Website	Confidei	30 Nov 202		26 Nov 202	17 Apr 2023	Approved	
WP9	D9.1	D64	H - Requirement No. 1	- The procedures and criteria that will be used...	CSIC	Ethics	Confidei	30 Nov 202		26 Nov 202	17 Apr 2023	Approved	
WP9	D9.2	D65	POPD - Requirement No. 2	- The beneficiary must check if special derogat...	CSIC	Ethics	Confidei	30 Nov 202		26 Nov 202	17 Apr 2023	Approved	
WP9	D9.3	D66	NEC - Requirement No. 3	- If applicable, detailed information to demons...	CSIC	Ethics	Confidei	30 Nov 202		26 Nov 202	17 Apr 2023	Approved	
WP9	D9.4	D67	EPQ - Requirement No. 4	- Further information about the possible harm t...	CSIC	Ethics	Confidei	30 Nov 202		26 Nov 202	17 Apr 2023	Approved	

FuturEnzyme

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HOW TO

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WP No	Del Rel. I	Del No	Title	Description	Lead B	Nature	Dissemin	Est. Del.	Rev. Due Dat	Receipt Date	Approval Date	Status	
WP3	D3.3	D14	Set of 100 best clones, 10 isol	This deliverable will consist in a set of selec...	IST IC	Other	Confidei	31 Mar 202		27 Dec 202	17 Apr 2023	Approved	
WP2	D2.3	D8	Set of 1,000 enzymes selecte	This deliverable will consist in a fasta file c...	BSC	Other	Confidei	31 May 202		27 Dec 202	17 Apr 2023	Approved	
WP8	D8.6	D48	Preliminary exploitation plan	This deliverable will consist in a report defin...	CLIB	Report	Confidei	31 May 202		30 May 202	17 Apr 2023	Approved	
WP8	D8.7	D49	FuturEnzyme project leaflet	This deliverable will consist in a series of le...	ITB	Website	Public	31 May 202		20 May 202	17 Apr 2023	Approved	
WP2	D2.4	D9	Set of 180 enzymes for experi	This deliverable will consist in a fasta file c...	BSC	Other	Confidei	31 Jul 202		27 Dec 202	17 Apr 2023	Approved	
WP4	D4.2	D19	The FuturEnzyme Portfolio of	This deliverable will consist in a set of prote...	CSIC	Other	Confidei	30 Sep 202		30 Sep 202	17 Apr 2023	Approved	
WP4	D4.3	D20	Cell-free expression/reportec	This deliverable will consist in a cell-free ex...	UHAN	Other	Confidei	30 Sep 202		27 Sep 202	17 Apr 2023	Approved	
WP4	D4.4	D21	Biomimetic protease producti	This deliverable will consist in a cgreen chemi...	FHNW	Other	Confidei	30 Sep 202		30 Jan 202	17 Apr 2023	Approved	
WP1	D1.2	D2	Initial-term external evaluati	This deliverable will consist in a series of re...	CSIC	Report	Confidei	30 Nov 202		29 Nov 202	17 Apr 2023	Approved	
WP3	D3.4	D15	Sequence, activity, and stabil	This deliverable will consist in the datasets i...	BANG	data set	Confidei	30 Nov 202		30 Nov 202	17 Apr 2023	Approved	
WP4	D4.6	D23	The metadata on expression y	This deliverable will consist in the big datase...	UDUS	data set	Confidei	30 Nov 202		30 Nov 202	17 Apr 2023	Approved	
WP4	D4.7	D24	At least 180 enzymes (recomt	This deliverable will consist in material of th...	CSIC	Other	Confidei	30 Nov 202		30 Nov 202	17 Apr 2023	Approved	
WP5	D5.1	D26	The shortlist of at least 18 en	This deliverable will consist in a report detai...	CSIC	Report	Confidei	30 Nov 202		30 Nov 202	17 Apr 2023	Approved	
WP8	D8.9	D51	Report on public, intra-consor	This deliverable will consist in a report listi...	UHAN	Report	Confidei	30 Nov 202		29 Nov 202	17 Apr 2023	Approved	
WP4	D4.8	D25	Set of high-performing multi-	This deliverable will consist in materials repr...	CSIC	Other	Confidei	31 Jan 202		30 Jan 202	17 Apr 2023	Approved	





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WP1	D1.5	D5	Confidentiality legal documen	This deliverable will consist in confidentialit...	CSIC	Report	Confidei	31 May 202		30 May 2023		Submitted
WP3	D3.5	D16	Set of new bio-resources to s	This deliverable will consist in a set of bio-r...	CNR	Other	Confidei	31 May 202		30 May 2023		Submitted
WP5	D5.2	D27	Set of 18 mutants generated l	This deliverable will consist in 18 mutants gen...	BSC	Other	Confidei	31 May 202		30 May 2023		Submitted
WP5	D5.3	D28	Set of 4 PluriZymes with singl	This deliverable will consist in the delivery o...	BSC	Other	Confidei	31 May 202		30 May 2023		Submitted
WP8	D8.12	D54	Short promo video/comic	This deliverable will consist in at least one s...	CSIC	Website	Public	31 May 202		30 May 2023		Submitted

Milestones: 21 submitted, all of them at due time

- 3 due for this month

Grant Management

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


Open Data 

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ABS Regulation 

Milestones

SAVE

Number	Name	Lead Beneficiary	Delivery Date (Annex I)	Achieved	Delivery Date (actual)	Comments
1	First Consortium General Assembly convened	CSIC	30 Jun 2021		08 jun 2021	The First Consortium General Assembly (kick off... 
29	First version FuturEnzyme website	CSIC	30 Jun 2021		28 jun 2021	The first draft for the FuturEnzyme website was... 
5	Set of 50,000 homology-driven sequences pre-selected	CSIC	31 Aug 2021		31 ago 2021	For the achievement of this milestone, internal... 
30	First version database for data management completed	CSIC	30 Sep 2021		27 sep 2021	This milestone consists in creating the first v... 
6	Set of 500 computational-driven sequences selected	BSC	30 Nov 2021		24 nov 2021	Report/sequences available - this milestone wil... 
9	First round of functional screens completed	IST ID	30 Nov 2021		24 nov 2021	Materials available - this milestone will attes... 
10	First round of sequencing completed	BANGOR	30 Nov 2021		24 nov 2021	Data available - this milestone will attest to ... 
12	First set of 250 enzymes expressed at mg scale	CSIC	31 Mar 2022		30 mar 2022	Report/material available - this milestone atte... 
13	First set of benchmark enzyme materials available	CSIC	31 Mar 2022		30 mar 2022	Report/material available - this milestone atte... 
11	The first sampling campaign completed	CNR	31 May 2022		27 may 2022	This milestone attests the completion of campai... 
14	Characteristics, first 180 enzymes (WP2-top ones)	UDUS	31 May 2022		27 may 2022	This milestone attests for the realisation and ... 



Milestones: 21 submitted, all of them at due time



- 3 due for this month

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Milestones



Number	Name	Lead Beneficiary	Delivery Date (Annex I)	Achieved	Delivery Date (actual)	Comments
15	Characteristics, first 3 multi-enzyme blends	CSIC	30 Sep 2022	<input checked="" type="checkbox"/>	27 sep 2022	Data available - this milestone will attest the...
16	Genetic engineering: first round completed	BSC	30 Sep 2022	<input checked="" type="checkbox"/>	27 sep 2022	Report/material available - this milestone will...
17	Supramolecular engineering: first round completed	FHNW	30 Nov 2022	<input checked="" type="checkbox"/>	29 nov 2022	Report/material available - this milestone attt...
18	First set of PluriZymes	BSC	30 Nov 2022	<input checked="" type="checkbox"/>	29 nov 2022	Report/material available - this milestone atte...
4	First inter-consortia confidentiality agreements	CSIC	31 Jan 2023	<input checked="" type="checkbox"/>	30 ene 2023	Minutes approved, consortia - this milestone co...
19	First set of best enzymes at gram scale	Bio_Ch	31 Jan 2023	<input checked="" type="checkbox"/>	30 ene 2023	This milestone will attest the realisation of t...
20	First set of lead enzymes at multi-gram scale	EUCODIS	31 Mar 2023	<input checked="" type="checkbox"/>	31 mar 2023	This milestone attests the realization of the f...
2	Mid-term review	CSIC	31 May 2023	<input checked="" type="checkbox"/>	30 may 2023	This achieved milestone consists in preliminar ...
7	First version of the HMM online web completed	UHAM	31 May 2023	<input checked="" type="checkbox"/>	30 may 2023	Tool available to consortium - this milestone c...
8	First version of the predictive online web completed	BSC	31 May 2023	<input checked="" type="checkbox"/>	30 may 2023	Tool available to consortium - this milestone c...
22	First round of laundry tests completed	HENKEL	31 Jul 2023	<input type="checkbox"/>		
23	First round of textile tests completed	SCHOELLER	31 Jul 2023	<input type="checkbox"/>		
24	First tests for hydrolysis of hyaluronic acid (HAh)	CSIC	31 Jul 2023	<input type="checkbox"/>		





Next Deliverables (all)

- D4.4 delivered but reopened with the PO's consent (new due date month 30, November 2023)

Del Number	Title	WP number	Lead beneficiary	Description	Type	Dissemination level	Due Date	Month/year
D4.4	Biomimetic protease production system, developed	WP4	9-FHNW	This deliverable will consist in a cgreen chemical-system by which to metamorphose, through the use of catalytic suicide inhibitors, esterases capable to be produced at high yields, into versatile biomimetic proteolytic systems. This deliverable will be accompanied by a report detailing the protocol of design and use, which will be made available in the internal FutureEnzyme repository	Other	Confidential, only for members of the consortium (including the Commission Services)	16 (30)	September 2022 (November 2023)
D4.5	At least 9 enzyme crystal structures	WP4	1-CSIC	This deliverable will consist in a set of crystal structures of best enzyme prototypes. This deliverable will be accompanied by a report detailing the structures and PDB codes and their features and characteristics. This information will be associated to the QR codes linked to each enzyme, which will be made available in the internal FutureEnzyme repository	Other	Confidential, only for members of the consortium (including the Commission Services)	30	November 2023
D5.4	Set of 3 multi-purpose PluriZymes	WP5	9-FHNW	This deliverable will consist in the delivery of 3 PluriZymes with multi-purpose activities. This deliverable will be accompanied by a report detailing the methods used to generate such PluriZymes, the activities they support and the datasets describing their performances and stabilities. This information will be linked to the corresponding QR code associated to each enzyme, which will be made available in the internal FutureEnzyme repository	Other	Confidential, only for members of the consortium (including the Commission Services)	30	November 2023
D5.5	Set of 18 improved enzymes by supramolecular engineering	WP5	11-INOFEA	This deliverable will consist in 18 mutants generated by supramolecular engineering. This deliverable will be accompanied by a report detailing the nano-immobilisation method applied to generate the engineered nanoformulations and the datasets describing their performances and stabilities. This information will be linked to the corresponding QR code associated to each enzyme, which will be made available in the internal FutureEnzyme repository	Other	Confidential, only for members of the consortium (including the Commission Services)	30	November 2023





Next Milestones (all)



MS Number	Title	WP number	Lead beneficiary	Means of verification	Due Date	Month/year
MS22	First round of laundry tests completed	WP7	14-HENKEL	Report available - this milestone will attest the completion and outcomes of the first laundry tests	26	July 2023
MS23	First round of textile tests completed	WP7	13-SCHOELLER	Report available - this milestone will attest the completion and outcomes of the first textile tests	26	July 2023
MS24	First tests for hydrolysis of hyaluronic acid (HAh)	WP7	1-CSIC	Report available - this milestone will attest the completion and outcomes of the first enzymatic tests for hydrolysing hyaluronic acid	26	July 2023
MS25	First tests for producing HAh at gram scale	WP7	12-Bio_Ch	Report available - this milestone will attest the completion of first tests for producing hyaluronic acid products at gram scale	28	September 2023
MS26	First trials for incorporating HAh into cosmetics	WP7	15-EVO	Report available - this milestone will attest the completion and outcomes of the first cosmetic production tests	30	November 2023
MS31	Media package released	WP8	8-ITB	Package on website - this milestone will attest the completion of the first set of the media package products	30	November 2023



First reporting period outcome



- Meeting at Brussels with WP leaders, Project Officer (Colombe Warin) and external evaluator (Prof. Martin Rebros) - 01.02.2023
- Technical Part A and B approved
- Financial part approved
- Payment received at CSIC - 18.05.2023
- Documentation delivered at de CSIC's department for partner distribution

Project: 101000327 — FuturEnzyme — H2020-FNR-2020-2

Ref. Ares(2023)1217795 - 20/02/2023



EUROPEAN COMMISSION
EUROPEAN RESEARCH EXECUTIVE AGENCY
REA B – Green Europe
B.3 – Biodiversity, Circular Economy and Environment

Manuel FERRER
CSIC
CALLE SERRANO 117
28006 MADRID
SPAIN

Subject: Horizon 2020 Framework Programme
Project: 101000327 — FuturEnzyme
Project review (Article 22)
Draft project review report

Dear Madam/Sir,

I am writing in connection with the above-mentioned review procedure for your grant.

Please find enclosed the draft review report. As you know it was drafted with the help of outside experts.

In our view, the project implementation is satisfactory.

To improve the implementation, we would recommend the following changes:

No change needed, project well on track with a potential to become a success story.

⚠ Please also note that a positive assessment of the technical work does NOT automatically guarantee that the costs will be accepted. This will depend on a number of other factors (such as compliance with cost eligibility rules, which will be assessed separately, on the basis of your financial statements and financial audits, if any).

Please submit **observations** — within **30 days** of receiving this letter — as formal notification via your [Funding & Tenders Portal account](#).

I would be grateful if you could inform the other members of your consortium (if any) of this letter.

For any questions, please contact us via your [Funding & Tenders Portal account](#).

Yours faithfully,

Authorised by Francisco Javier PEINADO LEBREÑO
(REA/B/03) (peinafr) on Mon Feb 20 12:28:06 CET
2023

Authorising Officer

Enclosures: Review report

European Research Executive Agency (REA), B-1049 Brussels, BELGIUM

Project: 101000327 — FuturEnzyme — H2020-FNR-2020 / H2020-FNR-2020-2

Ref. Ares(2023)2768286 - 19/04/2023



EUROPEAN RESEARCH EXECUTIVE AGENCY (REA)

REA B – Green Europe
B.3 – Biodiversity, Circular Economy and Environment

Manuel FERRER
AGENCIA ESTATAL CONSEJO
SUPERIOR DE INVESTIGACIONES
CIENTIFICAS
CALLE SERRANO 117
28006 MADRID
SPAIN

Subject: Horizon 2020 Framework Programme
Project: 101000327 — FuturEnzyme
Periodic reporting: RP 1
Interim payment (Article 21 GA)

Dear Madam/Sir,

In connection with your request for interim payment, I would like to inform you that we will soon make a **payment of EUR 1,357,858.18**.

You will find the detailed calculations (including cost rejections and limit to the interim payment ceiling, if any) in the enclosed documents.

If you are coordinator, please distribute this payment between the members of your consortium without delay.

Please ensure that the other members of your consortium (if any) are informed of this letter.

For any questions, please contact us via your [Funding and Tender Portal account](#).

Yours faithfully,

Authorising Officer

cc: Other members of the consortium (if any)

Enclosures: Financial statement assessment sheet(s)
Interim payment calculation sheet
Project overview

1

1



Nagoya protocol on Access and Benefit-Sharing



- The Advisory Board, Project Officer and the external evaluator at the RP1 meeting highlighted the importance of Nagoya protocol and ABS regulation.
- **CSIC as coordinator** will present the needed document (due diligence form) on behalf of the consortium. Already in contact with the department for the Spanish Government.
- If any partner has an **internationally recognised compliance certificate** for enzymes/samples/microorganisms/etc. of interest for the project, send it to the coordinator and the project manager.
- When a **sampling campaign is planned**, be aware of the country's regulations.
- **When an enzyme is going to be transferred** to Schoeller, Henkel, Evonik or Eucodis always fill and upload the **Nagoya template** in the shared OneDrive folder (access in intranet, ask Markus Müller for permission).
- The **webinar Managing data & resources: examples in research projects** (09 June 2023) organized by FuturEnzyme included a talk by Noelia Vallejo, from the Ministry for the Ecological Transition and the Demographic challenge, about Nagoya and ABS, where she answered some questions from the participants.
- More information: <https://www.cbd.int/abs/>



Cluster Enzymes for Greener Products

- Topic ID: FNR-16-2020. Programme: Horizon 2020 Framework Programme. Work programme part: Food security, sustainable agriculture and forestry, marine, maritime and inland water research and the bioeconomy. Call: Food and Natural Resources (H2020-FNR-2020)
- Projects: EnXylaSope (101000831), OxiPro (101000607), RadicalZ (101000560), FuturEnzyme (101000327)





Cluster Enzymes for Greener Products



- Joint actions in the last 6 months
 - Events
 - FuturEnzyme-OxiPro. Workshop on Computational Enzyme Bioprospecting and Engineering. 22-23 May 2023.
 - FuturEnzyme-OxiPro. Your impact on environment and society: Workshop on Responsible Research & Innovation. 21 June 2023.
 - FuturEnzyme-OxiPro-EnXylaScope. Webinar Managing data & resources: examples in research projects. 09 June 2023.
 - Policy Brief. All. Enzyme solutions in targeted consumer sectors can significantly reduce greenhouse gasses and increase product sustainability. Released on February 2023.
 - Newsletter. All. The Active Site. Issue #4 released on 15 February 2023, Issue #5 released on 18 May 2023. **Subscribe [here](https://radicalz.eu/cluster/)** (<https://radicalz.eu/cluster/>)
 - Publications
 - FuturEnzyme-OxiPro. Increased Thermostability of an Engineered Flavin-Containing Monooxygenase to Remediate Trimethylamine in Fish Protein Hydrolysates. Marianne Goris, Isabel Cea-Rama, Pål Puntervoll, David Almendral, Julia Sanz-Aparicio, Manuel Ferrer, Gro Elin Kjæreng Bjerga. <https://doi.org/10.1128/aem.00390-23>
 - Repository: OxiPro and [FuturEnzyme](https://zenodo.org/communities/futurenzyme/?page=1&size=20) (<https://zenodo.org/communities/futurenzyme/?page=1&size=20>) Communities on Zenodo (feel **free to add** in our Community any data/material/etc. you see convenient)





Recommendations from Advisory Board, Project Officer, and external evaluation, and issues to discuss



- More presence of the Advisory Board during the current implementation of the project. Important for the project management to have independent perspective and feedback about the project progress. [Already more involved, present in this meeting.](#)
- Increased spending is planned in forthcoming period since production and screening of enzymes will be more time and resource consuming.
- The developed enzyme screening kit will be available also through some members of the Advisory Board.
- [Partners can access to the metadata](#) (repositories Zenodo, website intranet, MareNostrum).
- Eucodis is already a part of Biosynth GmbH (from 28 June 2023). [Does PIC change?](#)
- The [technical report and feedback from the Project Officer and external evaluator from the first reporting period was sent to the AB](#) on 22 February 2023.
- The [website should be linked to enzyme producing companies](#) e.g Novozymes, Advanced Enzymes, Dupont, etc... to be discussed and implemented.

FuturEnzyme Technologies of the FUTURE for low-cost ENZYMES for environment-friendly products

24 M meeting

Hamburg, 06-07.07.2023



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