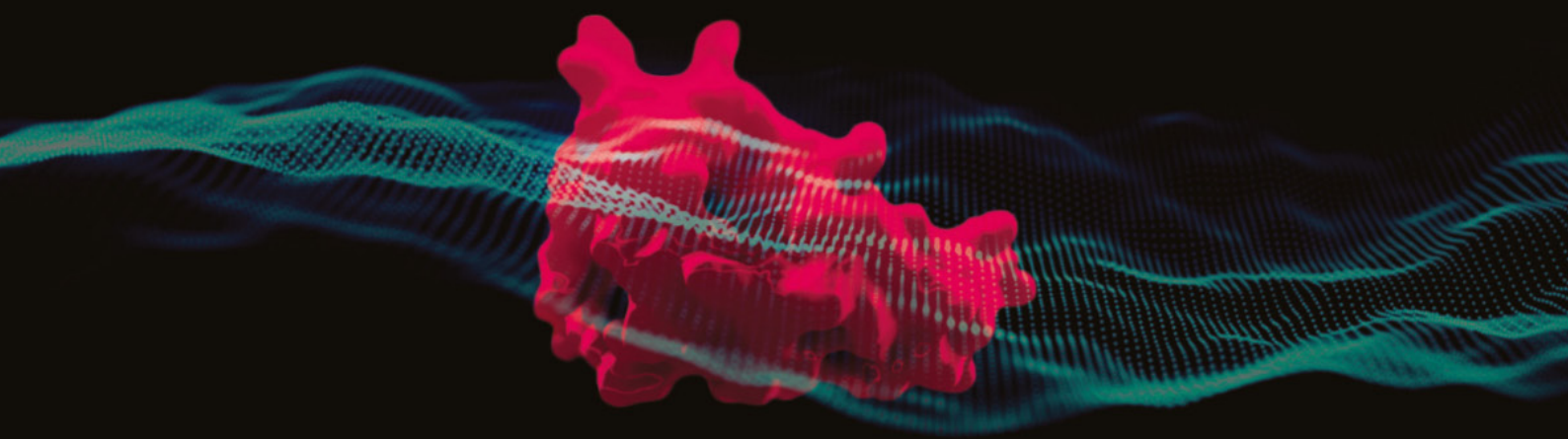


HOT NEWS NO. 2

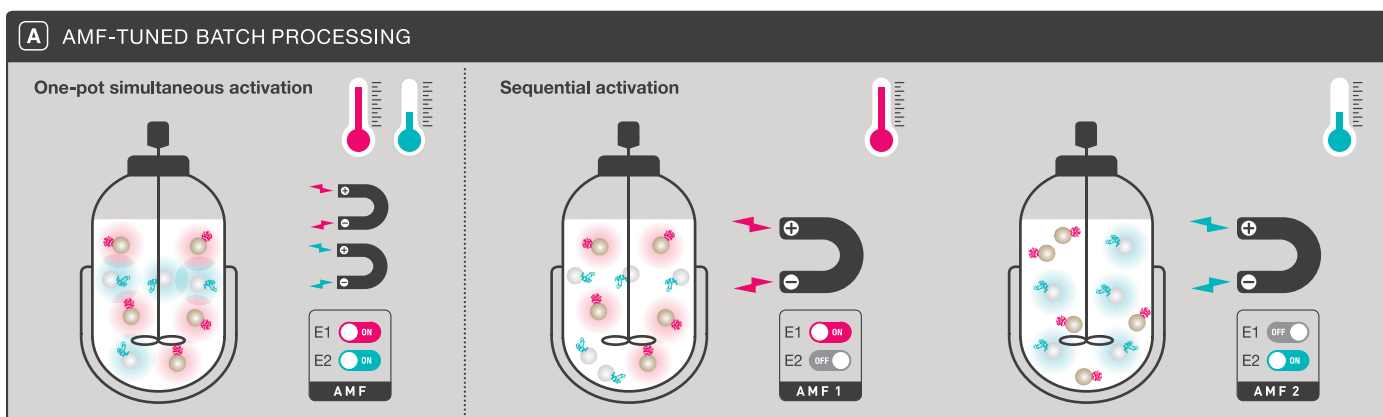
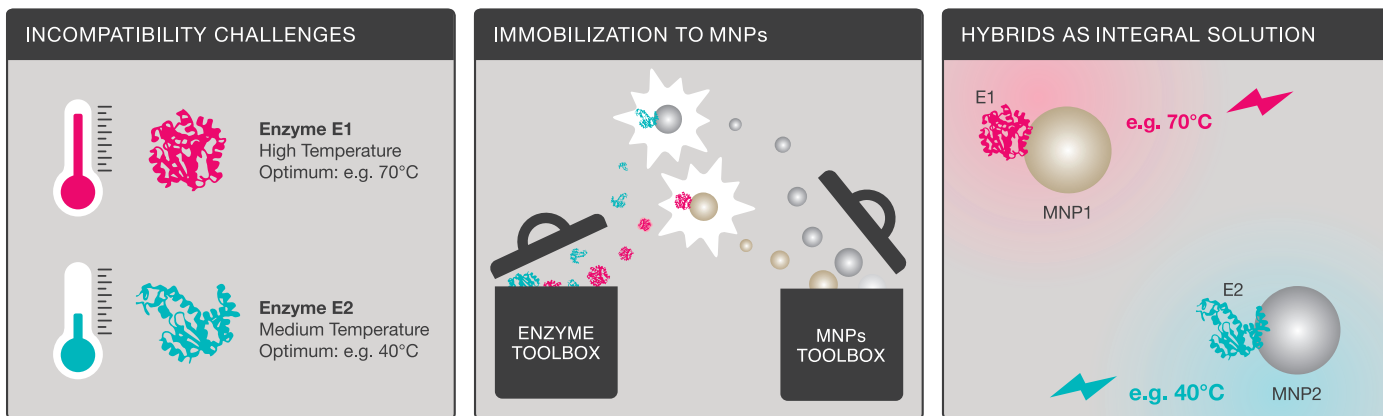


Welcome to our second newsletter of the H2020-FETOPEN project HOTZYMES.

2020 was a very special year with unforeseen and difficult circumstances due to the Corona pandemic.

Nonetheless, our HOTZYMES consortium was very active in participating and organizing online events and publishing promising results in various papers. Therefore, we are happy to present selected highlights and upcoming events in the fascinating field of biocatalysis.

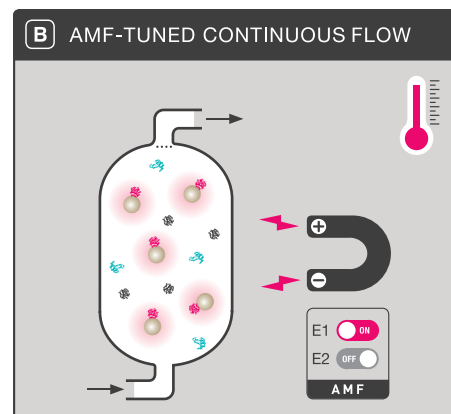
We wish you a pleasant read!



HOTZYMES aims to enhance the biotechnological production of pharmaceutical and biocommodities. The use of multi-enzymatic processes is considered a promising biomanufacturing platform, although several challenges need to be solved – from cross reactivity found in enzyme cascades over enzyme inactivation or inhibition at unsuitable temperature to finding the optimal reaction conditions.

To enable the optimal temperature conditions for each reaction in a multi-step-scheme, HOTZYMES couples enzymes to magnetic nanoparticles that are controllable at nano-scale locally. Using magnetic heating, functional control over different enzymes will be exerted. This will be enabled by an immobilisation of enzymes on magnetic particles, which are exposed to an alternating magnetic field. Due to molecular movement, a desired micro-temperature can be created at the outer layer of the particle, where the catalysts are going to be attached. To ensure an easy separation, re-utilization and integration into bioreactors, these conjugates will be integrated within porous microparticles.

To meet this technological break-through, a new generation of magnetic bioreactors specific to the field of biocatalysis will be designed.



Further information on
www.hotzymes.eu



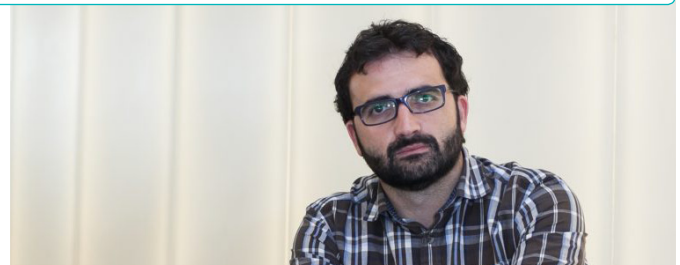
FIRST ANNUAL MEETING: On April 3th 2020, the HOTZYMES consortium consisting of 7 partners of 4 European countries met to a very special annual meeting – held online due to the COVID-19-pandemic. Results were discussed and new forms of dissemination and networking via online conferences laid out in order to promote the project and get in touch with interesting people from science and industry.

ACADEMIANET – EXPERT DATABASE OF OUTSTANDING WOMEN ACADEMICS

Our coordinator Dr. Valeria Grazú had joined Academia-Net – the expert database for outstanding female academics-, having been nominated by the Consejo Superior de Investigaciones Científicas (CSIC). A network of renowned research organisations from all over Europe supports this European network managed by the Swiss Nationale Science Foundation.

This initiative brings excellent women researchers into the spotlight and thus helps addressing under-representation of women in academic leadership positions. The database contains the profiles of women academics from all disciplines, being a helpful tool for decision-makers, journalists, conference organizers, etc to find proven female experts.

To check the profile of Dr. Grazu and those of more than 300 awesome women academics and scientists visit: <https://www.academia-net.org/profil/maria-valeria-grazu-bonavia/1723280> and <https://www.academia-net.org/project>



YOUNG ACADEMY OF SPAIN

Prof. Fernando López Gallego, IKERBASQUE professor at CIC biomaGUNE and molecular biologist by training, was selected as a member of the Young Academy of Spain. The selection process was really tough: only 13 out of 185 candidates have been successful! For more information, you can find an article (Spanish) about this accomplishment [here](#).

PROMOTION TO RESEARCH SCIENTISTS

All project members want to congratulate Dr. Angel Millán and Valeria Grazú from CSIC-ICMA, as this last February they have been promoted from Tenured Scientists to Research Scientists.

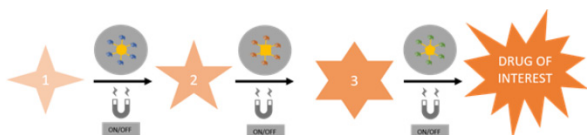


SBAN – SPANISH CONFERENCE ON BIOMEDICAL APPLICATIONS OF NANOMATERIALS ONLINE

The third Spanish Conference on Biomedical Applications of Nanomaterials (SBAN) was held online on September 3rd 2020. The event for leading-edge research in Nanomedicine is co-organised by HOTZYMES consortium members, including the Instituto de Ciencia de Materiales de Madrid – ICMM – CSIC and the Instituto de Ciencia de Materiales de Aragón – ICMA including online- and poster talks from HOTZYMES members.

FALLING WALLS LAB

HOTZYMES took part at the Falling Walls Conference with the presentation “Breaking the wall of enzyme regulation” of Dr. Eduardo Melo from HOTZYMES partner Forschungszentrum Jülich. To know more about fascinating changes in the world of biocatalysis, check out the [Blog article \(in German only\)](#) and [Video with the presentation of Eduardo Melo \(english\)](#)!



RESEARCH INNOVATION DAYS 2020

Also powered by the Pathfinder programme and in collaboration with FETFX, the Future Tech Week took place online between 21st - 25th September 2020 as part of the European Research and Innovation Days. It celebrates future and emerging technologies (FET) and projects, which set new trends across the scientific, technological and business sphere and promotes European research.

Members of HOTZYMES from the acib dissemination team attended both events and introduced the project e.g. at the Science is Wonderful exhibition.

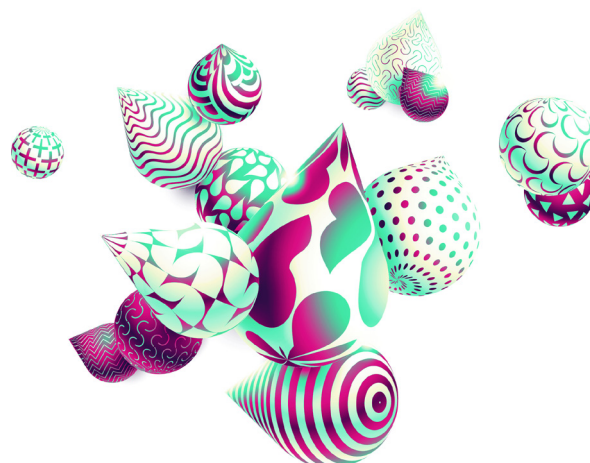


Illustration by Future Tech Week

EUROPEAN RESEARCHERS NIGHT “LIFE IS SCIENCE”

HOTZYMES participated in the European Researchers Night Life is Science, held in Graz, Austria and organized by consortium partner acib. HOTZYMES contributed short videos: Valeria Grazú and Jesús G. Ovejero from CSIC gave a project overview and insight on how HOTZYMES will play a part e.g. in cancer therapy. Nicolás Cassinelli, Founder and Director of nB nanoscale Biomagnetics, talked about designing and building magnetic bioreactors.



WANDERLUST ZARAGOZA: EUROPEAN RESEARCHERS NIGHT 2021 EDITION

HOTZYMES participated in the Wanderlust Zaragoza: European Researchers night 2021 edition with different talks, stands and TV interviews. Indeed, Dr. Ilaria Armenia participated in a stand with other CSIC-ICMA lab members. Besides, Valeria Grazú gave a talk about enzymes and nanoparticles and how they can make a more sustainable industry in a relaxed atmosphere sharing the stage with magicians, live music and cartoonists.

INTERNATIONAL DAY OF WOMEN AND GIRLS IN SCIENCE 2021 EDITION

HOTZYMES took part in the celebration of the International Day of Women and Girls in Science. Different members participated in on-line dissemination activities with schools and round tables.

As an example, Dr. María Moros participated in an online dialogue with the theme „SCIENCE FROM DIFFERENT PERSPECTIVES“.



EU RESEARCH MAGAZINE

HOTZYMES is part of the Autumn 2020 Issue from the EU Research Magazine. Check out the interview in the link below (Pages 12-13) from Valeria Grazú, senior researcher at CSIC, about magnetic nanoparticles that heat up enzymes and catalyse reactions more efficiently – a quantum leap for the chemical industry of the future:

Link to the publication:

https://issuu.com/euresearcher/docs/digital_magazine_eur24

STABILIZATION OF B-GLUCURONIDASE BY IMMOBILIZATION IN MAGNETIC-SILICA HYBRID SUPPORTS

β -Glucuronidases are a class of enzymes that catalyze the breakdown of complex carbohydrates. They have well documented biocatalytic applications in synthesis, therapeutics, and analytics that could benefit from enzyme immobilization and stabilization. In this work, the co-immobilization of vulgata β -Glucuronidase with magnetic nanoparticles was reported by using biomimetic silica mineralization as immobilization strategy. Storage, thermal, and operational stability were superior for the enzyme immobilized in the obtained hybrids. Besides, the integration of the MNPs enables to facilitate their reuse.

Link to the publication:

<https://www.mdpi.com/2073-4344/10/6/669>

CONTINUOUS PRODUCTION OF MAGNETIC IRON OXIDE NANOCRYSTALS BY OXIDATIVE PRECIPITATION

Continuous processes are always preferred over batch ones when reproducible and scalable industrial procedures are needed. This work illustrates the production of magnetite nanoparticles by oxidative precipitation in aqueous media, following a continuous approach that offers additional advantages that are shown in this publication.

Link to the publication:

<https://www.sciencedirect.com/science/article/pii/S1385894720305842>

MIXING IRON OXIDE NANOPARTICLES WITH DIFFERENT SHAPE AND SIZE FOR TUNABLE MAGNETIC PROPERTIES AND HEATING PERFORMANCE

In this article a systematic study was carried out on the heating properties of a set of samples obtained by mixing together elongated and spherical iron oxide nanoparticles. It was showed that mixing the nanoparticles in different proportions allows to modulate the magnetic response of the samples. As a consequence, in proper testing conditions, the heat efficiency of the mixed samples could be larger compared to that obtained as the sum of those of the parent nanoparticles.

Link to the publication:

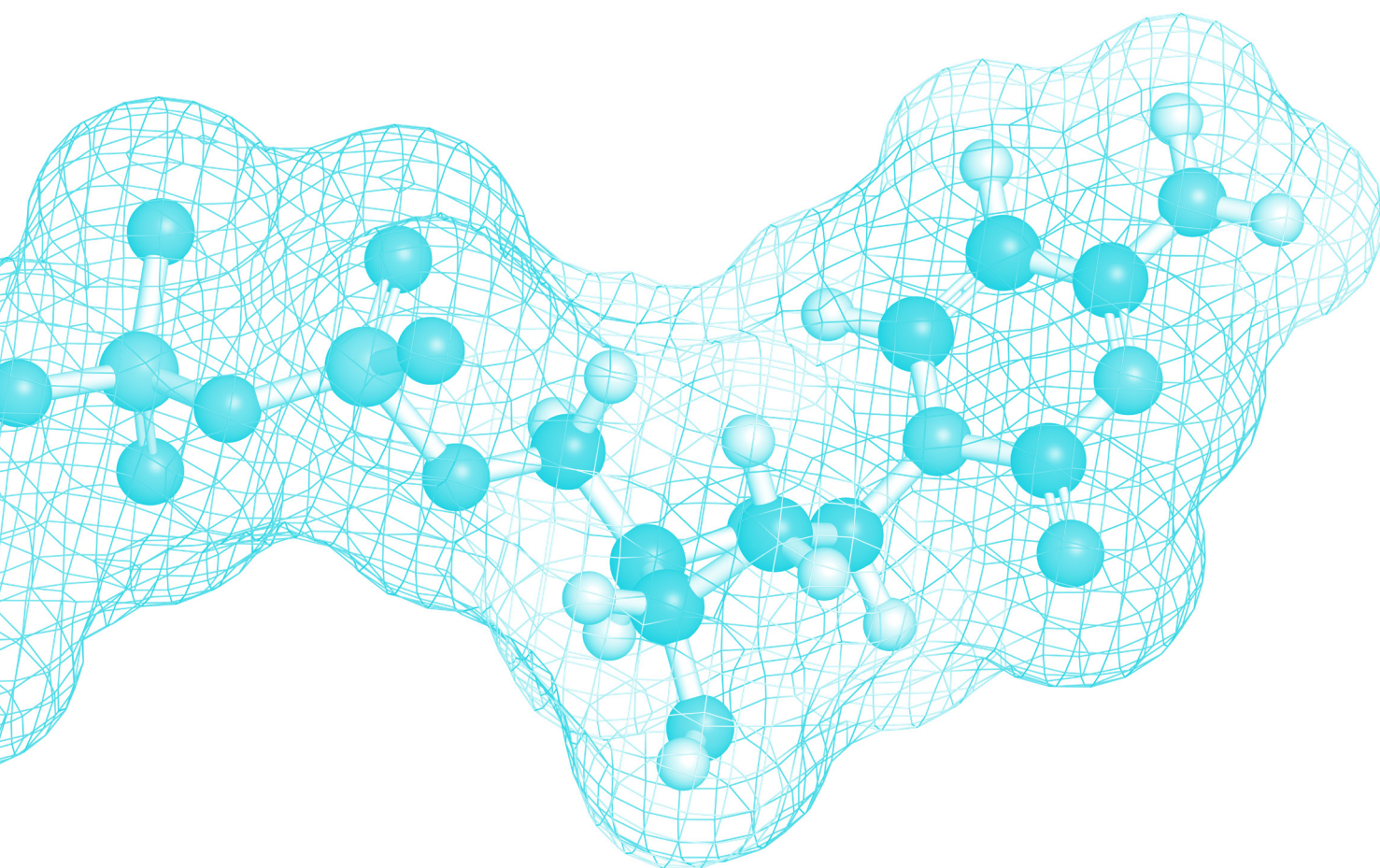
<https://pubs.rsc.org/en/content/articlelanding/2021/nr/d0nr09121a#divAbstract>

MAGNETIC IRON OXIDE COLLOIDS FOR ENVIRONMENTAL APPLICATIONS

Magnetic colloids possess catalytic properties for the treatment of polluted waters and the efficient production of fuel alternatives. This kind of materials presents great advantages that will be introduced in this chapter. In particular, this chapter will consider the case of magnetic iron oxide colloids, which can be easily synthesized at low cost, are biocompatible and presents a well-developed surface chemistry.

Link to the publication:

<https://www.intechopen.com/online-first/magnetic-iron-oxide-colloids-for-environmental-applications>



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HOTZYMES @ ZENODO

Visit our Zenodo#HOTZYMES community to find all publications derived from our project:

<https://zenodo.org/communities/hotzymes/about>

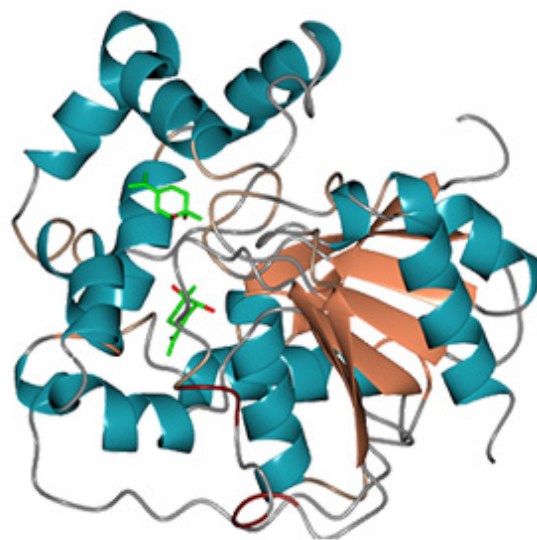
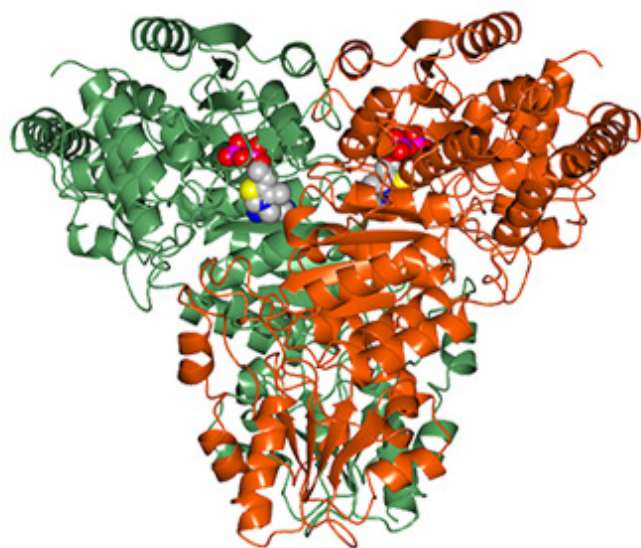


Illustration by ESAB

ESAB WEBINARS

We would like to encourage your participation in the webinars organized by the European Society of Applied Biocatalysis (ESAB). ESAB is chaired by our Expert Advisory Board (EAB) member Prof. Dr. Roland Wohlgemuth. Check the list of upcoming webinars at: www.esabweb.org

More Info & News

www.hotzymes.eu



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