MUR
Ministero dell'Università e della Ricerca

REPLAY

REconnecting PLAstics life cycle to biogeochemical cycles by sustainable hydrolysis and Yeasts fermentation

PROJECT START 1ST OF JUNE 2022;
DURATION: 36 MONTHS

UNIVERSITÀ DEGLI STUDI DI MILANO BICOCCA
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UNIVERSITÀ DEGLI STUDI DI NAPOLI FEDERICO II

THE REPLAY PROJECT

The use of plastics is inevitable due to their unique mechanical properties and low cost compared to other materials. However, the downside is that plastics have been considered non-biodegradable and accumulate in the environment.
Currently, most of the plastic waste is burnt or landfilled, representing a loss of resources and creating a cascade of environmental issues. Therefore, there is a strong need for the development of new degradation and recycling technologies, in particular for fossil-derived plastic polymers. Besides that, material upcycling with the production of a unique portfolio of products is also desirable.
In this context, the REPLAY project aims to address this issue by realizing a new concept of plastic (bio)refinery in which post-consumer waste plastic can be seen as a feedstock for microbial activity.

OUTCOME

REPLAY will work to create a hybrid biorefinery model that aims to upcycle PET molecules to generate other products with added value, through microbiological, enzymatical and chemical approaches, incorporating plastics into the Circular Economy.

PROJECT OBJECTIVES

- Create a plastic waste-based process that will avoid the down-cycling of plastics and promote the upgrading of plastic waste.
- Implement the use of systems and synthetic biology, (bio)chemical, and (bio)process engineering to enable yeasts to convert PET degradation products into organic acids.

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