

Faculty of Engineering

Summer Research Program 2024-2025

Project Title: Developing enzymatic vitrimers: next generation reusable plastics.

Supervisor(s): Matthieu Gresil

Department: Materials Science and Engineering

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Website profile of project supervisor:

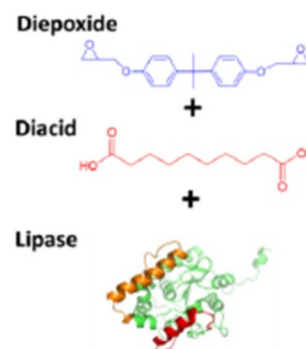
<https://research.monash.edu/en/persons/matthieu-gresil>

Objective

In this project, we aim to develop and assesses enzymes as a transesterification catalyst for manufacturing and tailoring multifunctional vitrimers.

Project Details

This project will move biological catalysts from their native, wet environment to solid organic engineering materials. Properly selected enzymes will allow us to create economical mass-market polymer products that can be fully recycled, and having multifunction polymers such as self-healing, shape morphing, bonding/debonding, mechanically tunable, and reprocessing. This work will initiate a disruptive change in the manufacture of multifunctional materials and explore a previously undescribed application of biocatalysts in removing environmentally hazardous materials from processing of bulk polymers, coatings, and composites, while lowering the energy requirements and also adding desirable functionality. Our approach offers a more sustainable route to higher value bio-engineering materials.



Prerequisites

Polymers science

Additional Information

Applicants may be required to attend an interview