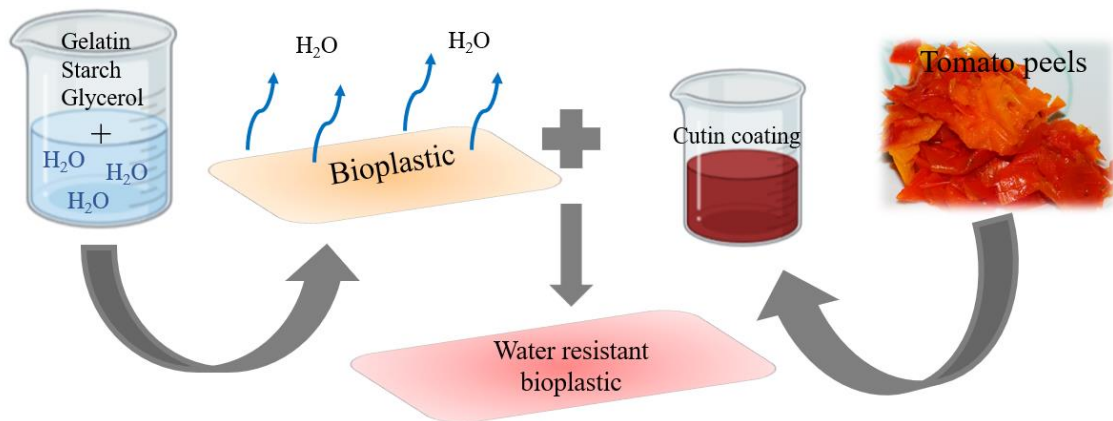


Best Organic Wastes Recycling Presentation at Environ 2023

Winner Marta Mroczkowska, South East Technological
University, Carlow



Supervisors: Dr Adriana Cunha Neves, Dr David Culliton, Dr Kieran Germaine

Thesis Title: Development of piscine gelatine-starch blend bioplastic and cutin based hydrophobic coating as a replacement for petroleum-based plastic.

Degree: PhD

Web Links: [LinkedIn](#) | [Orcid ID](#)

This project aim is to develop bioplastic from biomass recovered from food waste streams that is durable and water-resistant while being home compostable.

The bioplastic generated is a fish gelatine and starch blend. Fish gelatine is produced from the by-products of the fish processing industry, making this bioplastic ingredient highly accessible and sustainable. Similarly, the tomato processing industry generates large volumes of by-products, such as seeds and skins. Cutin is a polymer that can be extracted from tomato skins and in this project, it has been formulated into a coating for the bioplastic to improve its water barrier properties.

Findings: Results up to date show that the bioplastic generated in this project is fully biodegradable in soil within a two months period. This is a significant finding from the point of view of the waste collecting companies as it means packaging made with this material could be discarded into the compost bin. Moreover, the water barrier properties of the bioplastic coated with cutin coating are significantly lower than bioplastic without coating. This shows that the cutin coating, which can be made from waste from tomato processing by-products, can improve bioplastics resistance to moisture and its performance as food packaging. Combining natural materials for improvement of bioplastic properties to resemble petroleum-based plastic is a promising option for repurposing food waste.