Developing a bio-based catalyst for low-cost bioplastic production

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Summary

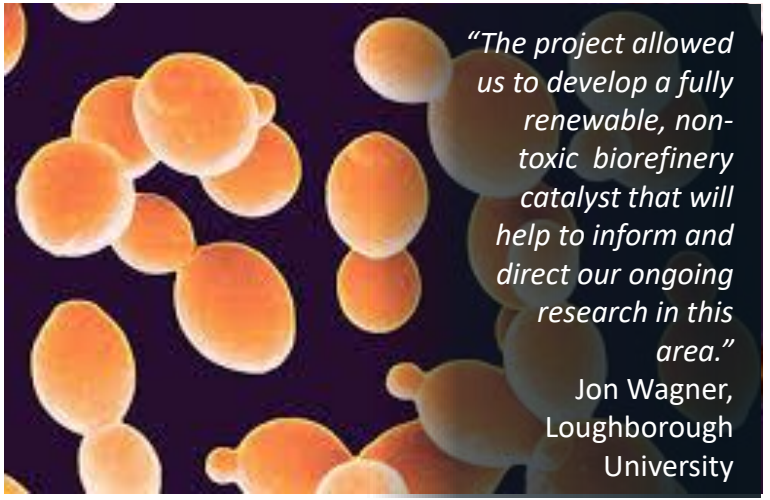
This project sought to isolate, characterise and test a new, nontoxic and bio-derived catalyst for the oxidation of 5-HMF into FDCA. FDCA is an important precursor for PEF, a renewable alternative for conventional PET.

Aims

- Isolate and characterise affordable, nontoxic and renewable biorefinery catalyst
- Test catalyst for oxidation of 5-hydroxymethylfurfural (5-HMF) into 2,5-furandicarboxylic acid (FDCA)
- Estimate associated processing costs and economic potential

Outcomes

- Targeted biomineral success-fully isolated and characterised
- Stable in water, eliminating use of organic solvents.
- Avoids use of expensive and environmentally harmful metals during synthesis.
- Enhanced activity and selectivity compared to baseline iron oxide catalyst
- High recovery and reusability post reaction



"The project allowed us to develop a fully renewable, non-toxic biorefinery catalyst that will help to inform and direct our ongoing research in this area."
Jon Wagner, Loughborough University

Image from: https://datodranuar.com/wp/2020/04/11/metschnikowia-pulcherrima-could-disrupt-the-palm-oil-industry/

This proof-of-concept project was awarded by the Biomass Biorefinery Network and funded by BBSRC. For more information visit bbnet-nibb.co.uk.