

LIGNIN VALORIZATION IN CELLULOSIC ETHANOL PLANTS: BIOCATALYTIC CONVERSION VIA FERULIC ACID TO HIGH VALUE CHEMICALS

Lignin can be obtained as a by-product of cellulosic ethanol production, and is a potential source of renewable chemicals, if methods for lignin valorization can be developed. Efficient valorisation of lignin is a major unsolved problem in the development of sustainable biorefineries. The proposal builds upon an existing BBSRC partnership award, and brings together expertise in biocatalyst discovery and lignocelullose ethanol production (CTBE) with expertise in biocatalytic lignin valorization (Warwick) and biocatalysis for high value chemicals production (Manchester, UCL) The overall aim is to generate new methods for lignin valorization via intermediate ferulic acid, which has been generated from lignin in previous PI's works. The project will involve the following work packages: 1) optimization of lignin generation from cellulosic bioethanol; 2) conversion of lignin to ferulic acid from lignin using synthetic biology; 3) enzymatic conversion of ferulic acid into pharmaceutical L-Dopa; 4) biocatalytic generation of high value fragrance chemicals (coniferyl acetate, isoeugenol) from ferulic acid; 5) bioprocess and scale-up of chemicals production from renewable feedstocks; 6) technical and sustainability impact assessment. Technology developed in the project could be applied to major plant feedstocks used in Brazil (sugar cane) or the UK (wheat).

PRINCIPAL INVESTIGATORS

FABIO MARCIO SQUINA
University of Sorocaba (UNISO)
TIM DAVID HOWARD BUGG
University of Warwick

ABOUT THE PROJECT

FAPESP Process 2015/50590-4
Term: Jun 2017 to May 2022
Thematic Project
UKRI – BBSRC

CONTACT

✉ fmsquina@gmail.com