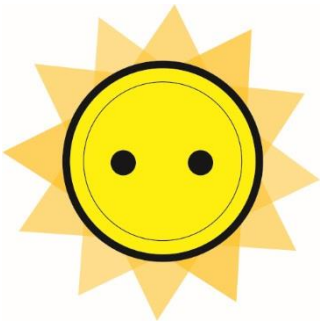

Depolymerization of Lignin and Bioconversion of Lignin-derived monomers to biofuels (LIGFUEL)

Lignocellulose is the most abundant biomass for biorefineries and a substantial amount of it is available as agricultural 'waste' residue. Technologies for the production of second-generation biofuels from biomass mainly rely on the conversion of cellulose and, to a lesser extent, hemi-cellulose to fermentable sugars. Although lignin forms a significantly large fraction (~ 25 – 30%) of the biomass, there has been much less focus on utilizing lignin and converting it into biofuel or other value-added chemical – mostly for its recalcitrant nature and lack of appropriate technologies. This project will focus on the development of efficient microbial cell factories, i.e. reprogrammed bacterial strains for lignin depolymerization and conversion to value-added products. By biological valorization, the carbon and energy stored in lignin can be utilized in a sustainable manner. The strategies and methods for the strain engineering include adaptive laboratory evolution, development of synthetic biology tools, and metabolic engineering of two microbial chassis for the conversion of lignin-derived monomers to alkanes and hydroxyalkanoates.

The project will synergize the efforts of three groups led by **Prof. Guhan Jayaraman**, IIT Madras, India; **Assist. Prof. Ville Santala**, Tampere University of Technology, Finland, and **Prof. Lars M. Blank**, RWTH Aachen University, Germany.

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