

Towards renewable flavors, fragrances, and beyond

Background

- Esters constitute a large group of molecules with applications as flavors, fragrances, pharmaceuticals, cosmetics, green solvents, and advanced biofuels
- Global demand of esters in food, household cleaner, personal care, and perfume industries is increasing while the ester supply from natural sources has been limited
- Development of novel microbial cell factories for ester production from renewable feedstocks can potentially provide an alternative and sustainable source of natural esters and hence help fulfill growing demand

Approach

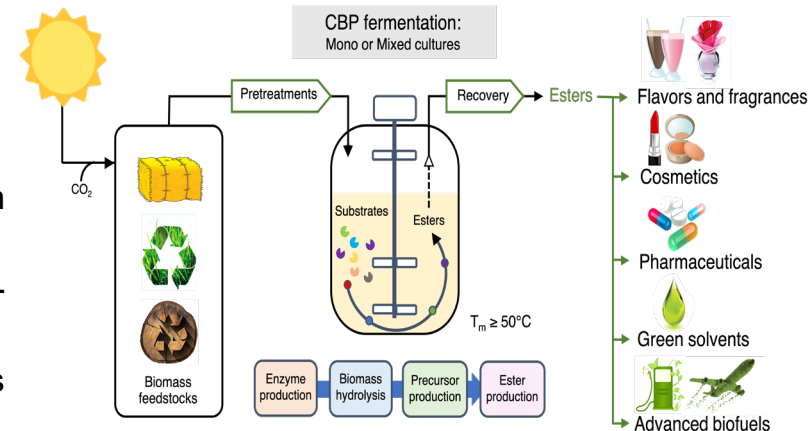
- Here, we review recent advances in microbial production of esters and provide perspectives for improving its economic feasibility

Outcomes

- Microbial cell factories offer sustainable and renewable production of natural esters
- Modular cell design enables rapid construction of optimal ester-producing strains with minimal strain optimization cycles
- Repurposed chloramphenicol acetyltransferase enables thermophilic microbial production of esters
- Thermophilic consolidated bioprocessing microbial platform offers economical production of renewable esters

Significance

- This study highlights **i)** recent advances in microbial production, **ii)** challenges and opportunities in microbial production, **iii)** modular cell design for efficient combinatorial biosynthesis and **iv)** thermophilic consolidated bioprocessing microbial platform for sustainable production of esters



Schematic of a thermophilic CBP microbial platform for production of esters from renewable resources.