

Precision fermentation for the production of biobased chemicals in the context of biorefineries

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The rapid growth of the global population, climate change, and the depletion of fossil fuels necessitate the development of a resource-efficient and sustainable economy. Advanced biorefineries, which convert biomass from agriculture, forestry, marine environments, and waste into a diverse range of products and bioenergy, offer a promising solution. These biorefineries are essential to the circular economy, as they close resource loops and maximize output valorization. Their development relies on an interdisciplinary approach, with Biotechnology playing a crucial role. This talk will explore the current impacts, challenges, and future prospects of Biotechnology, emphasizing precision fermentation and synthetic biology in the context of biorefinery. A case study on the bioproduction of resveratrol, a high-value antioxidant polyphenolic compound, will be presented. Traditionally extracted from plants or synthesized chemically through complex and unsustainable processes, resveratrol can be biosynthesized through precision fermentation^{1,2,3}, providing a sustainable and economical alternative within the context of biorefineries^{4,5,6}.

Keywords: Precision fermentation, Biorefinery, Waste valorisation, Biobased chemicals; resveratrol

References:

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