



3.º BIO **IBEROAMÉRICA**

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ASHBYA GOSSYPII AS AN ALTERNATIVE CELL FACTORY FOR THE VALORIZATION OF INDUSTRIAL WASTE AND BY-PRODUCT STREAMS

Molecular Biotechnology, Systems Biology and Metabolic Engineering

OP - (762) - ASHBYA GOSSYPII AS AN ALTERNATIVE CELL FACTORY FOR THE VALORIZATION OF INDUSTRIAL WASTE AND BY-PRODUCT STREAMS

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Body

Ashbya gossypii is a filamentous hemiascomycete that stands in the intersection between industrial models and non-conventional microorganisms. It has been used for more than 30 years in the industry for the biotechnological production of riboflavin (vitamin B₂) and in the last decade the exploration and improvement of this fungus natural metabolism established it as an alternative cell factory for the biotechnological production of other high-added value compounds such recombinant proteins, γ -lactones, microbial lipids, orotic acid, among others [1-4]. By means of metabolic engineering, improvements have been also accomplished in what concerns the range of substrates used by this fungus [3] and its performance in more challenging cultivation conditions [3-4]. This presentation will address the metabolic and process engineering strategies we used to develop *A. gossypii* as an alternative cell factory for the *de-novo* production of: (i) γ -lactones from glucose-based substrates, (ii) microbial lipids from mixed formulations of corn-cob hydrolysates, sugarcane molasses or crude glycerol, and (iii) orotic acid from crude glycerol. The examples given will demonstrate the biotechnological potential of this fungus towards the recycling and valorization of industrial waste and by-product streams, and aim to contribute to a sustainable and circular bioeconomy.

Acknowledgements

This work was carried out at the Biomass and Bioenergy Research Infrastructure (BBRI), supported by Compete 2020, Portugal 2020, Norte 2020 and Lisboa 2020 (LISBOA-01-0145-FEDER-022059), MoveToLowC (POCI-01-0247-FEDER-046117) and by FCT through the strategic funding of UIDB/04469/2020 and project ESSEntial (PTDC/BII-BTI/1858/2021).

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Image Legends

Graphical abstract.

Palavras-chave : *Ashbya gossypii*, Metabolic engineering, γ -lactones, Microbial lipids, Orotic acid

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