

Thursday 24<sup>th</sup> of September,  
2<sup>40</sup>-3<sup>40</sup> pm

## GLUCOSINOLATES AS NUTRACEUTICALS:

### PROCESS OPTIMIZATION AND SCALE-UP OF BIO-BASED MICROBIAL PRODUCTION OF GLUCOBRASSICIN

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Link to personal room:

<https://campus-unimib.webex.com/campus-unimib-en/j.php?MTID=m7dc3bf0b495e303b02778b159015c4c1>

## ? BACKGROUND

- A sustainable microbial-based biotechnological process implies the utilization of renewable feedstocks, better if not edible, such as **lignocellulosic residues**
- In addition to bulk chemicals, nutraceuticals production is ready for a sustainable turnabout of production processes. Among nutraceuticals, **glucosinolates (GLSs)** possess cancer-preventive properties mainly thanks to their hydrolysis products

## ! ISSUE

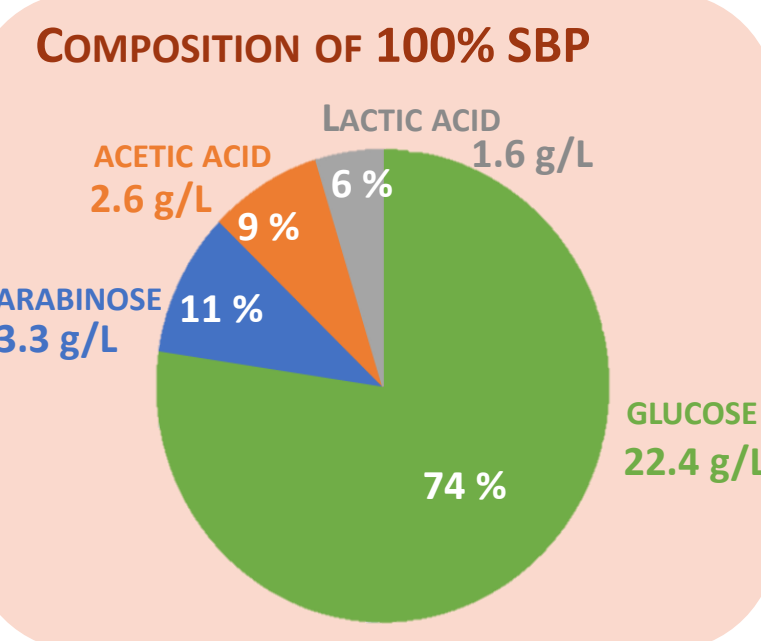
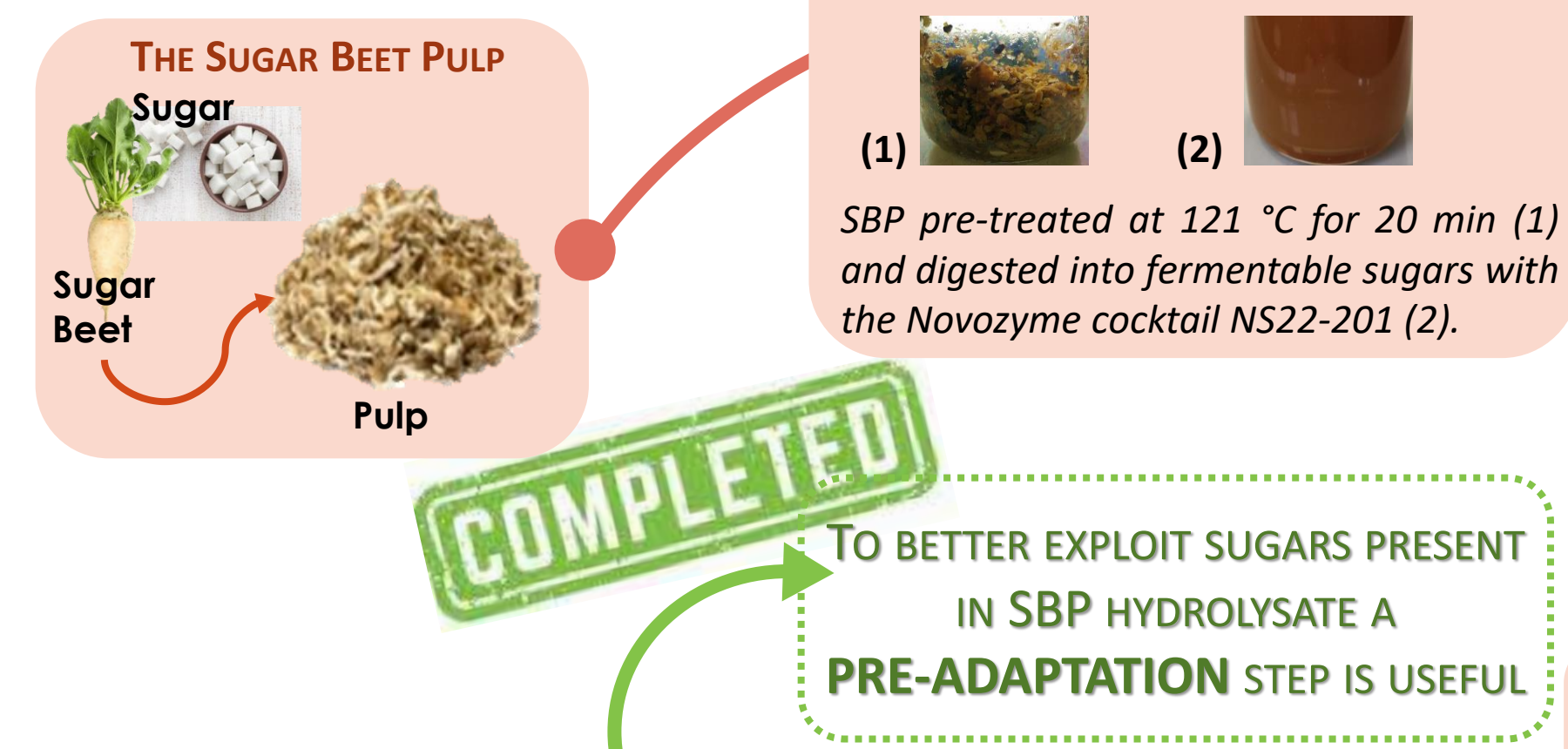
- Sugar beet pulp (SBP), a side stream of sugar production, is a promising lignocellulosic feedstock for microbial-based processes. The **release of inhibitors** during its pre-treatment can limit microbial growth
- GLSs naturally derive from cruciferous vegetables, but their **extraction** still poses **feasibility issues** at industrial scale and their chemical synthesis is challenging due to the complexity of the structures

## 💡 AIM

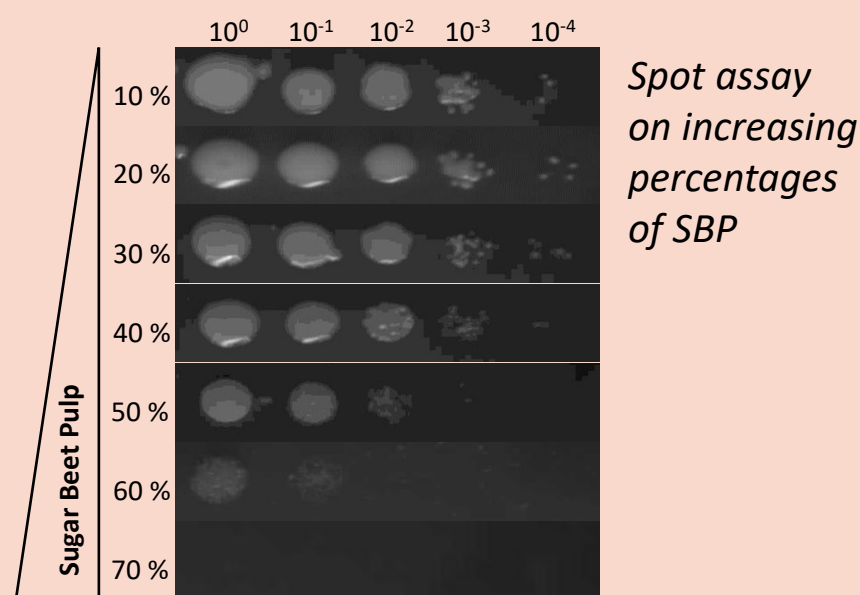
- The amelioration of yeasts **robustness** towards residual biomasses is crucial for the establishment of a sustainable and viable process of production
- We are tailoring a yeast cell factory, by metabolic engineering and synthetic approaches, for the heterologous expression of the plant biosynthetic pathway leading to the glucosinolate **glucobrassicin (GLB)**
- We are setting **preliminary tests** of our final products, GLB alone or in association with the hydrolytic enzyme myrosinase, to evaluate their effects on human epithelial cell lines

## What are we looking for?

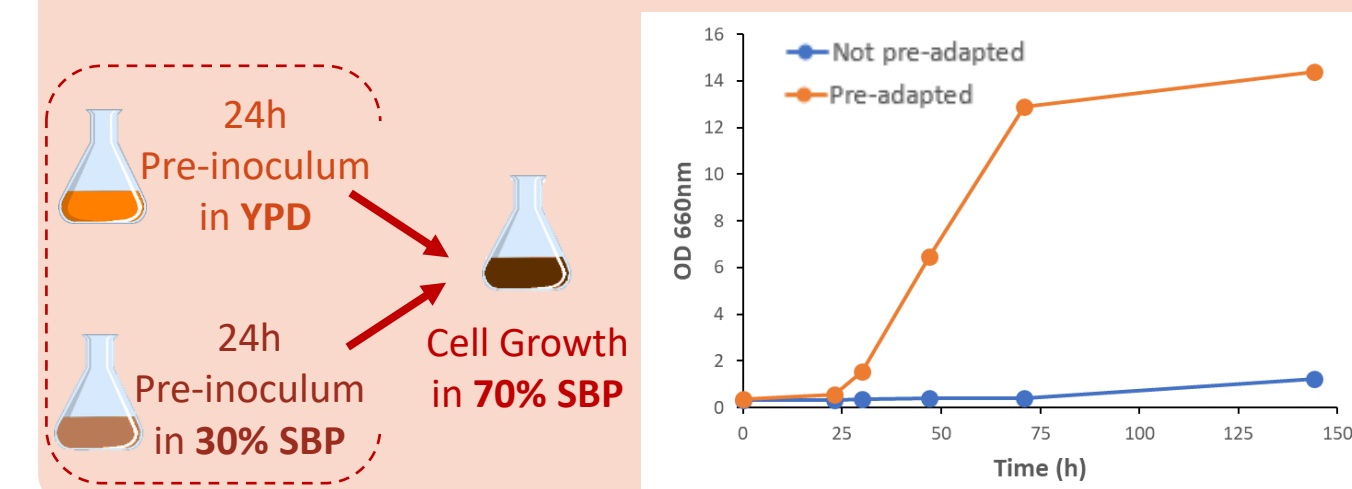
## BIO-BASED PROCESS



## YEAST GROWTH IS INHIBITED BY HIGH CONCENTRATIONS OF SBP



## PRE-ADAPTATION IN 30% SBP ALLOWS CELL GROWTH IN 70% SBP



## MICROBIAL PRODUCTION OF GLUCOBRASSICIN

