SCIENCESPRINGDAY

FACULDADE DE CIÊNCIAS E TECNOLOGIA
UNIVERSIDADE NOVA DE LISBOA

REQUIMTE/CQFB Departamento de Química

Engineering exopolysaccharide production

Systems biology and Engineering Group

requimte rede de química e tecnologia

SBE Systems Biology and Engineering Group

bpeg biochemical and process engineering group

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Objectives

- Development of modeling strategies for synthesis exopolysaccharide (EPS) production by *Enterobacter* A47, utilizing glycerol as an industrial byproduct (Fig.1 and 2)
- Application of systems biology approaches to design strains with higher EPS productivity.
- Optimization of reaction conditions for EPS production.

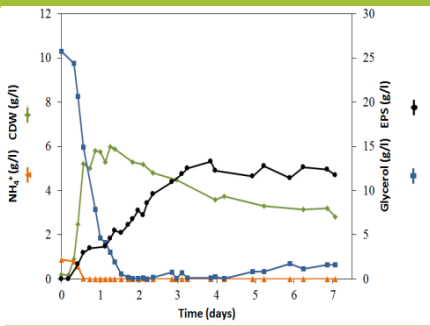

Fig. 1 – Fed-batch fermentation kintics

Methodology

- Constraint based approaches for modeling metabolic networks, such as Flux Balance Analysis, Elementary Modes Analysis and Principal Elementary Modes Analysis (Fig. 3).
- Hybrid modeling and optimization with Artificial Neural Networks for fermentation data sets.
- Utilization of bioinformatic tools and available information to elucidate EPS biosynthetic pathways.

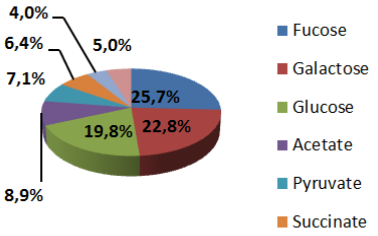

Fig. 2 – EPS chemical composition

Expected Results

- The construction of a metabolic network for *Enterobacter* A47 should provide accurate flux distribution prediction.
- Development of a Hybrid Metabolic Model to account for differences in EPS composition.
- Optimization of EPS production in bench-scale bioreactors.
- Design of a more productive *Enterobacter* A47 strain for EPS production

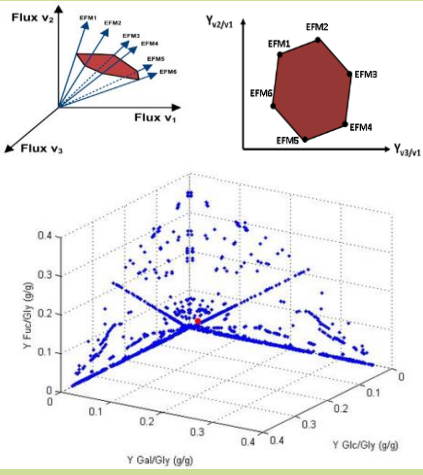

Fig. 3 – Constraint-based approaches for metabolic network analysis

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