

REQUIMTE/CQFB Departamento de Química

## Bioproduction of succinic acid

Biochemical and Process Engineering Group



## Margarida Carvalho

(PhD student in Sustainable Chemistry)  
April 2011- present

**Graduation and Master degree:** Cell Biology and Biotechnology (FCUL)  
2002-2006

**Research Technician:** Eco-Ethology Unit (ISPA)  
2008 - 2011

## Objectives

This project aims at developing an environmental and economically sustainable succinic acid (SA) production process using renewable feedstocks. SA is a precursor for many other industrial derivatives (Figure 1) and is mainly produced via a petrochemical-based process. Renewable feedstocks will be tested as substrates and downstream processing will be optimized, in order to increase SA productivity and separation process selectivity while reducing chemicals and energy requirements, developing a sustainable and greener process.

## Methodology

- Screening of different sources of rumen, in order to isolate new SA producers more efficient than the existing bacteria (Figure 2).
- Renewable feedstocks selection (Figure 3) for SA production. The best combination of isolated microorganism/feedstock, which maximizes SA productivity and yield while minimizes by-product synthesis, will be chosen.
- Fermentation process conditions and purification steps will be designed and optimized in order to improve SA productivity and yield.

## Expected Results

It is expected to develop and optimize an environmental and economically sustainable succinic acid production process using renewable feedstocks, capable of competing with the petrochemical-based process. Glycerol has already been tested as substrate for bioproduction of SA acid. SA yield and production rates obtained were the highest reported in the literature using glycerol as carbon source. Carob pulp is currently being tested as feedstock for SA bioproduction.

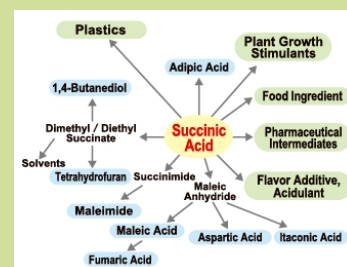


Fig. 1 – Succinic acid is a building block for many industrial derivatives.



Fig. 2 – Screening of new succinic acid producers from different sources of rumen.



Fig. 3 – Renewable feedstocks (glycerol, molasses, cheese whey) will be assessed as substrates for SA bioproduction.

Funding:

Margarida Carvalho acknowledges Fundação para a Ciência e Tecnologia for PhD research grant SFRH/BD/75032/2010