

## Downstream Process Development for Bio-Based Production of Polyphenols

**PhD student:** Marcelo Henriques da Silva  
Tel.: +31 152785123  
E-mail: M.D.HenriquesdaSilva@tudelft.nl

**Supervisor/copromotor:** Marcel Ottens

**Promotor:** L.A.M van der Wielen

**Institute:** Delft University of Technology,  
Department of Biotechnology,  
Bioprocess Engineering Group

**Project term:** February 2014 – February 2018

**Financed by:** 7<sup>th</sup> Framework Programme of the EU



### Description

Polyphenols are among the most widespread class of metabolites in nature, and their distribution is almost ubiquitous [1]. However, despite their wide range of possible applications (e.g., as food colorants, nutraceuticals and pharmaceuticals), this chemodiversity is still poorly characterized and used.

Most of the current industrial processes are based on the extraction of plant material which results in low yields and complicated downstream processing. For this reasons, a shift to a fermentation based process is currently being developed, where the genes encoding for bioactive berry fruit polyphenols are being inserted in different microbial production strains [2].

The goal of this project is to obtain an optimal fermentation based downstream process for the different classes of polyphenols, which is economically attractive and also attains the required final purity and stability. Focus will be put on liquid-liquid and solid-liquid extraction, which will require, amongst others, screening for the optimal solvents, resins and the associated operating conditions (e.g., temperature, pH) using high-throughput experiments (HTE) together with mechanistic, thermodynamic and process models.

### References

[1] Pereira, D.M., et al., Phenolics: From Chemistry to Biology. *Molecules*, 2009. 14(6): p. 2202-2211.

[2] The BachBerry project is financed by the 7<sup>th</sup> Framework Programme of the European Union: <http://www.bachberry.eu/>



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