

### Identification of physiologic state of hydrogentrophic methanogenic cultures by using a combined analytic strategy

#### BACKGROUND

The core of this invention is a combination of analytical and experimental methods, which allow a fast, cheap and easy way to identify different observable physiologic states in a BMP process.

It was found that a sole measurement of aspartic acid relative concentration validated by total protein measurement in the extracellular medium allows differentiating a healthy culture from a unhealthy culture. Moreover it was found that a sole measurement of the glutamic acid and alanine relative concentration allows differentiating a gas limited from a liquid limited culture. The method can be applied to new strains and cultures, after having done a specific set of experiments for method calibration controlling the desired physiologic state, validating it with advanced analytic strategies to obtain the corresponding extracellular fingerprint in terms of excretion or consumption linked to a physiologic state for the compounds of interest.



#### BENEFITS

Identifying the physiologic state in a BMP process is needed for the following aspects:

- Controlling the desired physiologic state for media development or operations.
- Adapting the process quantification with segregated biomass approaches when lysis occurs without investing in advanced gas analytic.
- Controlling the physiologic state in continuous process by adaption of the feeding strategy for improving process stability and preventing foam formation at reduced dilution rates.
- As a cheap and simple Process Analytic Tools (PAT) to follow up the bioprocess operation.
- Can be applied with different target amino acids as different bioprocess using different strains.
- Can be applied to monitor the exploitation of the biocatalytic activity.

**REFERENCE:**  
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**AVAILABLE FOR:**

- License Agreement
- Assignment
- Research Cooperation
- Development Cooperation

**KEYWORDS:**

BMP process quantification /  
Identification of physiologic  
states/ Bioprocess controll

**DEVELOPMENT STATUS:**

The technology is proven to be ready for a BMP process performed with methanothermobacter marburgensis. Application to another BMP process performed with other strains would need a calibration of the method in the host process.

**IPR:**

Austrian patent application submitted

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