MORPHOLOGIC OPTIMIZATION OF FUNGI

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HINTERGRUND

Fungi play an important role in biotechnological processes for the production of organic acids, enzymes, antibiotics, polyols, vitamins, (glyco-)lipids, and a wide variety of other secondary metabolites. However, the filamentous morphology of many fungi poses harsh constraints on process design and scale-up. Fungal morphology is highly sensitive to medium impurities and heterogeneities, making it hard to control in large-scale processes. This leads to high process costs and a high risk of batch failure.

Non-conventional yeasts such as the Basidiomycetes Ustilago and Pseudozyma don't have this disadvantage, but under stress conditions typically encountered in biotechnological processes they can start to grow filamentously with the abovementioned consequences.

LÖSUNG

In this innovation, the fungal host cell is morphologically arrested via genetic engineering in its most suitable yeast-like growing form. No more filamentous growth occurs, even under stress conditions such as low pH or high osmolarity. The clear advantage of this innovation was demonstrated on the biotechnological production of itaconic acid, enabling the use of Ustilago cynodontis, which otherwise grew filamentously, for the production of itaconic acid at low pH. The morphological engineering targets are highly conserved, making the innovation widely applicable in the fungal group of Basidiomycota, including Ustilago, Pseudozyma, Dacryopinax, Moniliella, and many other industrially relevant genera.
Filamentous vs. yeast-like growth of Ustilago

**VORTEILE**

- New possibilities for the biotechnological production via fungal strains
- Easier and more stable processes with yeast-like fungi
- Controlled biotechnological production of organic acids and other compounds
- No more filamentous growth

**SERVICE**

PROvendis is offering licenses for the invention to interested companies on behalf of the RWTH Aachen University. There is also the possibility of collaboration with the inventors.

**PUBLIKATIONEN & VERWEISE**