

BI(U)SY Pichia

The project BI(U)SY Pichia is a granted FFG project with a collaboration between the Austrian company BISY GmbH and the TU Wien.

Motivation

Most biopharmaceutical and technical enzymes are manufactured in classical batch or fed batch-based cultivation systems. This results in high batch to batch variations and renders difficulties for the downstream. Furthermore, reactor setup is expensive and sterilization and sanitization with base is not only energy consuming but also harmful to the environment. The establishment of continuous biomanufacturing is highly desired by industry as space-time yields can be improved at stable product quality. Unfortunately, microbial hosts suffer from instable productivity in common continuous cultivations, due to yet not understood reasons.

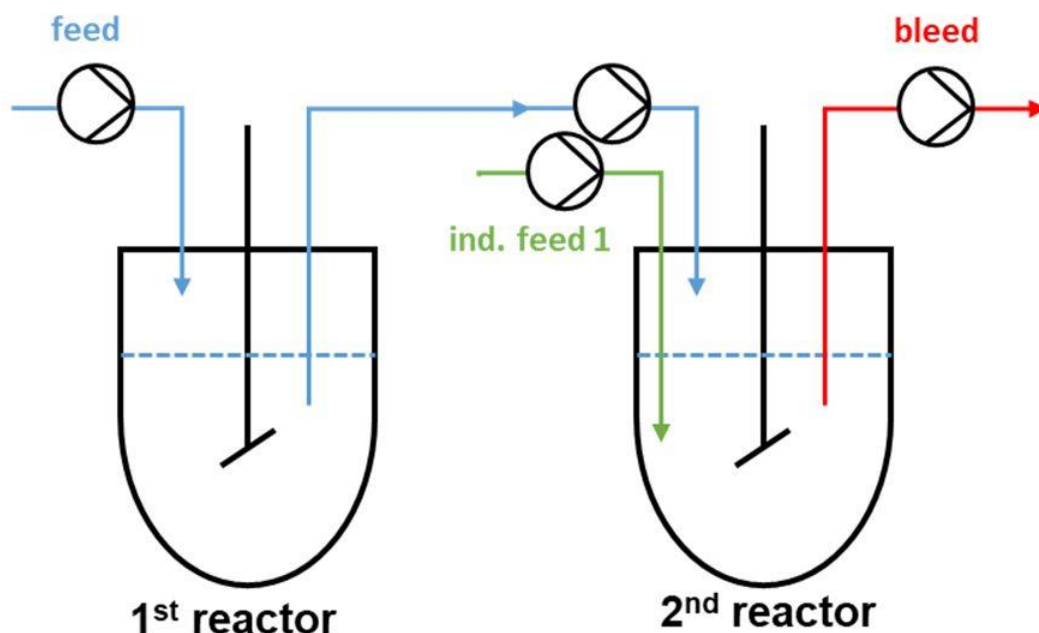


Figure 1: schematic drawing of cascaded continuous bioprocessing

Goal

P. pastoris is a frequently used host in multiple biotechnological applications, as cheap cultivations can be conducted at feasible growth rates and glycosylated protein secretion into the supernatant is possible at high specific productivities. Cascaded continuous cultivation has shown to be superior to common continuous cultivation systems. Hence, bi-directional promoter systems which can separate production of helper proteins and target protein, should be ideal for cascaded continuous cultivation.

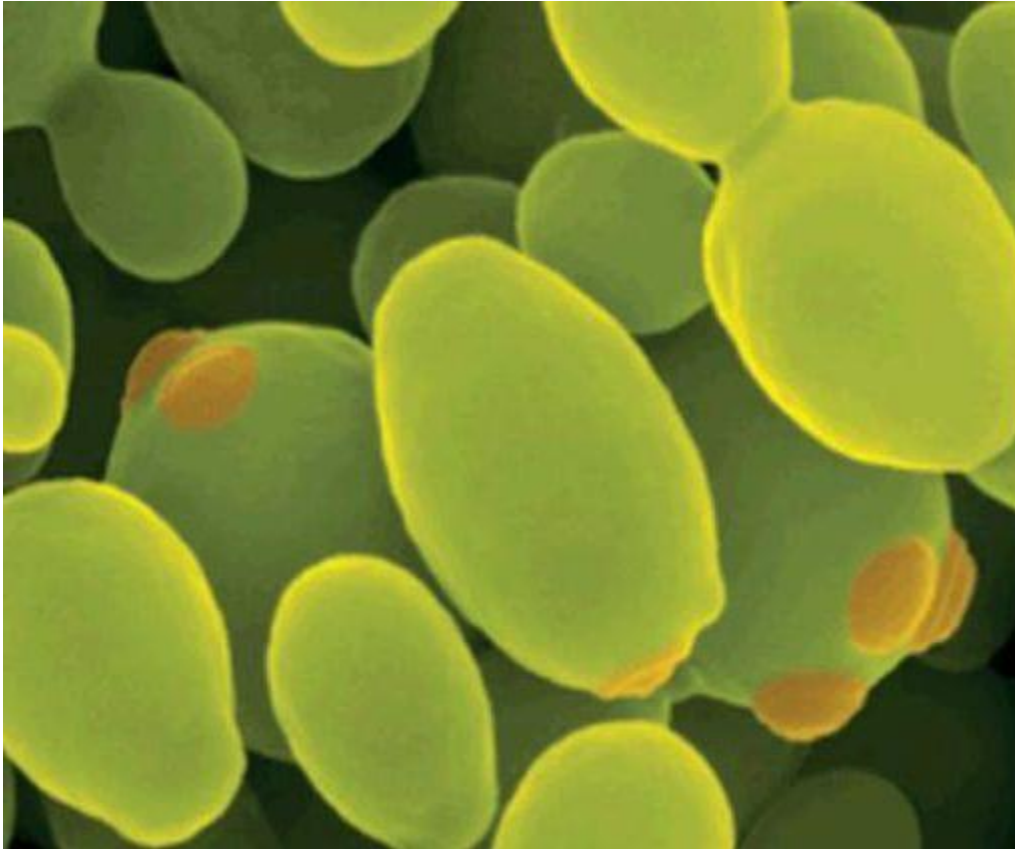


Figure 2: methylophilic *Pichia pastoris*

Approach

In previous studies, conducted in this working group, we established a cascaded continuous cultivation system to ensure constant productivity over a period of at least two weeks of induction with *E. coli*. The generated knowledge should be transferred to *P. pastoris* within the project BI(U)SY Pichia. We want to combine the benefits of the yeast host using bidirectional promoter systems supplied by BISY GmbH. with the benefits of the cascade culturing system. In using the bidirectional systems in the cascade, we will be able to spatially resolve the production of different genes of interest and enable a stable continuous production platform for *P. pastoris*. A variety of strains will thus be screened using different process parameters

References

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Further reading links

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