



## Biotechnological Versatility of the riboflavin producer *Ashbya gossypii*

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The ascomycete *Ashbya gossypii* is a natural producer of riboflavin closely related to *Saccharomyces cerevisiae*. Most of the studies related to this organism are either focused on riboflavin production or in the study of polarized hyphal growth on the molecular level. We further studied *A. gossypii* physiology by evaluating the similarities and differences of three related *A. gossypii* strains, ATCC10895, MUCL29459, IMI31268 and the more distant CBS109.26 [1]. Although *A. gossypii* ATCC10895 is often described as wild type, it differed from the parent strain, IMI31268, in specific and in colony radial growth rate on different carbon or nitrogen sources. In addition, although MUCL29450 was deposited as ATCC10895, it has clearly diverged from it, showing significant differences from the parental strain IMI31268 than ATCC10895. All strains tested had greater sensitivity to low pH than most filamentous fungi.

Apart from the physiological characterization of *A. gossypii*, the potential to produce valuable compounds, besides riboflavin, was explored. Cloning and expression of the heterologous proteins, endoglucanase I (EGI) and cellobiohydrolase I (CBHI) from *Trichoderma reesei* was achieved in *A. gossypii* ATCC10895, allowing to study the ability of this fungus to produce recombinant proteins [2]. Both proteins were secreted into the culture medium. Nonetheless, more EGI was secreted than CBHI, or more active protein was produced. Partial characterization of CBHI and EGI expressed in *A. gossypii* revealed overglycosylation when compared to the native *T. reesei* proteins, but less extensive than on cellulases expressed in *S. cerevisiae*. Therefore, the expression of recombinant cellulases in *A. gossypii* provides opportunity for future development of *A. gossypii* as a promising heterologous protein production host.

### References

- [1] Ribeiro O, Domingues L, Penttilä M, Wiebe G M "Nutritional requirements and strain heterogeneity in *Eremothecium gossypii* (*Ashbya gossypii*)" Submitted.
- [2] Ribeiro O, Wiebe M, Ilmén M, Domingues L, Penttilä M "Expression of *Trichoderma reesei* cellulases CBHI and EGI in *Ashbya gossypii*" *Appl Microbiol Biotechnol* (2010) **87**: 1437-46.