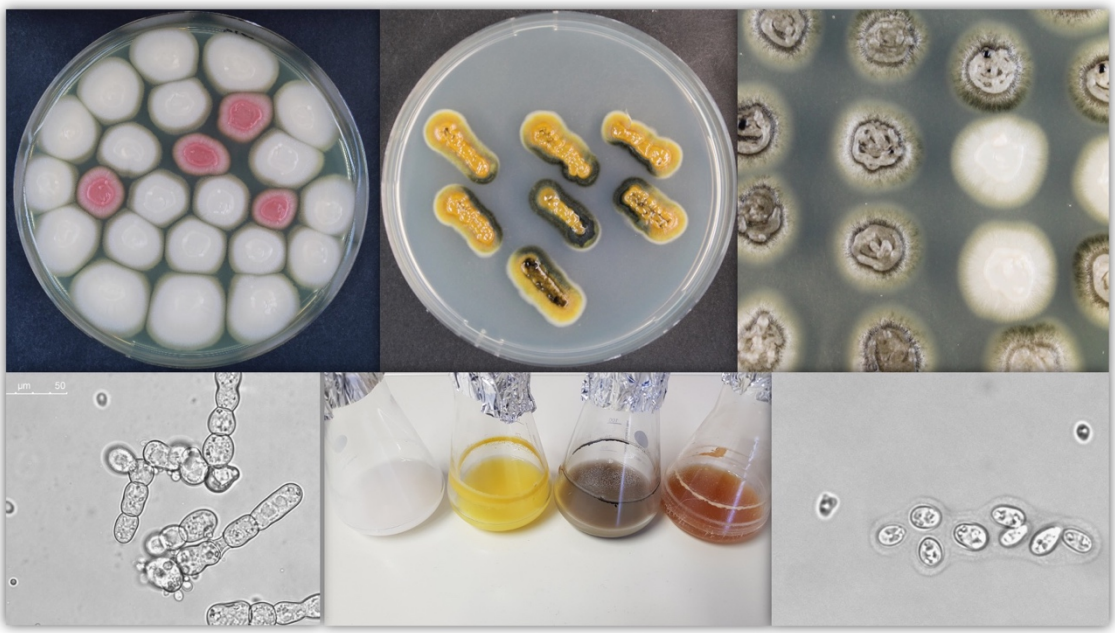
AN ALBINO *AUREOBASIDIUM PULLULANS* FOR BIOTECHNOLOGICAL APPLICATION (ALABAMA)



SUPERVISORY TEAM

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External academic partners: *Florian Freimoser, agroscope, Switzerland*

PROJECT DESCRIPTION

Aureobasidium pullulans is a ubiquitous, extremotolerant yeast-like fungus, that is used as for the industrial production of pullulan and other extracellular polymers. Unfortunately, melanin is arising as a side product during industrial bio-processes, which can spoil a production batch. Deletion of the melanin biosynthetic genes leads to a substantial loss of pullulans production rate, as the two anabolic pathways seem to be interlinked. Within this

project a deeper understanding of the regulatory mechanisms behind the obviously interlinked biosynthetic pathways for pullulan and melanin biosynthesis shell be achieved. The regulatory mechanisms will be investigated using epigenetic approaches, comparative genomics and transcriptomics, and CRISPR-mediated genome editing. Random mutagenesis and micro fluidic-assisted cell sorting can be used as a work around for the strain generation.

KEY GOALS AND TASKS

The primary aim of this PhD thesis is to understand which regulatory pathways and mechanisms (cAMP signaling, MAP kinase pathway, epigenetic mechanisms, yet unknowns, etc.) are responsible for the production of pullulan and melanin in *A. pullulans*. Ultimately, this knowledge shall contribute to the design of strain that produce melanin-free pullulan.

PROJECT-SPECIFIC REQUIREMENTS

- Completed master studies in Biochemistry or Molecular Biology or Biotechnology or closely related field
- Knowledge on the regulation of gene expression in eukaryotes
- Experience and skills in molecular biology and/or bioinformatics
- Interest in working with a unique fungus and state-of-the art genome and transcriptome analysis methods
- Enthusiasm for learning new methods and techniques
- Affinity for solving complex riddles
- Willingness to travel to project meetings and scientific conferences
- Excellent English language skills in scientific field
- Personal skills: independence but also being able to work in a team, solution-oriented thinking, detail-oriented working style