

# Wild yeasts: enzyme discovery and microbial cell factory development

- Explore and characterize novel yeast species and their carbohydrate active enzymes for bio-chemical production



**CHALMERS**

**Credits:** 30-60 ECTS

**Start date:** Flexible

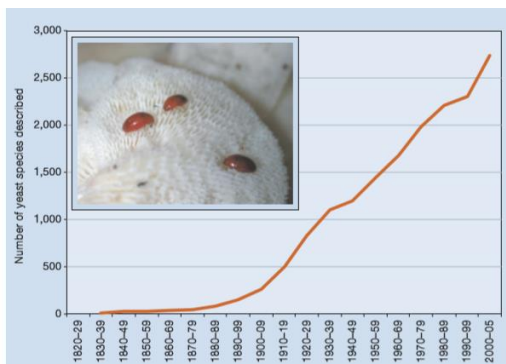
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**Department:** The Division of Industrial Biotechnology at the Department of Biology and Biological Engineering, Chalmers University of Technology in Gothenburg, Sweden.

## Project description and background:

Agricultural and forestry waste residues represents a huge reservoir of complex carbohydrates which currently go unused. This MSc project is part of large research effort at Chalmers to discover, develop and engineer yeast cell factories for production of bulk and high value biochemicals. Yeast biodiversity present a huge, untapped resource for present and future bio-industrial applications and we have only scratched the surface when it comes to exploiting wild yeast and their natural traits as effective enzyme producers and robust microbial cell factories.

**The aim of this Master Thesis project** is to explore new yeast species and their enzymatic activities and natural traits with relevance for effective fermentation of lignocellulosic substrates into bio-chemicals.



## Main tasks:

1. Explore and analyze yeast genomes for carbohydrate active enzymes
2. Characterize yeast enzymes by heterologous expression and enzyme assays
3. Ferment waste substrates in Bioreactors and analyze metabolites by HPLC and MS

## Learning outcomes:

1. Knowledge of novel yeasts and understanding their microbial degradation of plant carbohydrates and microbial cell factory development
2. Experience of techniques within Microbiology (culturing, growth), Molecular biology (PCR, cloning, gene deletions) and Analytical chemistry (HPLC)
3. Experience in protein expression (AKTA) and biochemical enzyme assays
4. Hands-on with large-scale (2L) Bioreactor fermentation