

Cooperative Master Project

Synthetic biology for protein secretion with *Corynebacterium glutamicum*

About Us:

The BIOSCALE group at KIT in cooperation with the institute of applied biology is looking for a student of bio engineering/ biotechnology/ applied biology to work on the following project.

The BIOSCALE group is situated within the Chemical Engineering (CIW) Faculty of the KIT. Our goal is to build novel microbial bioprocesses with the help of genetic engineering and bioprocess engineering. Our team envisions to construct industrial relevant microbial strains for the production of valuable products for the food, feed, cosmetics and pharmaceutical industry.

Project-Background: Genetic engineering for the design and construction of increased product formation by microbes is a key technology in biotechnology. Synthetic biology aims on utilization of genetic information such as promoter sequences, expression plasmids and coding sequences for the engineering of an optimized metabolism.

Alternative protein resources are highly demanded for the food industry in order to replace animal-derived protein resources. In this work, the cell factory *C. glutamicum* will be genetically engineered and optimized by synthetic biology approaches in order to establish an efficient secretion of proteins.

Your tasks:

- Construction of expression plasmids by DNA cloning (e.g. Gibson-Assembly)
- Genetic modification of *C. glutamicum* by transformation of synthetic DNA constructs
- Basic analytics for molecular biology e.g. PCR, SDS-PAGEs
- Cultivation and characterization of newly constructed strains for protein secretion
- Scientific discussion with the project team on a weekly basis
- Reporting of experiments and results

Project aim: The goal of the project is to design and construct expression plasmids and use them to engineering *C. glutamicum* for an improved protein secretion for food application.

Contact:

Dr. Nadja A. Henke
CZS Junior research group BIOSCALE
E-Mail: Nadja.henke@kit.edu

Prof. Dr. Andreas Diepold
Applied biology
E-Mail: Andreas.diepold@kit.edu

