



## Thesis (B.Sc. / M.Sc.)

### Protein based Synthetic Circuits in Yeast using Translocation for improved Kinetics

Even though RNA-based synthetic circuits offer advantages over protein-based circuits, their possible use in eukaryotes is quite limited. Protein-based circuits offer reliable control over gene expression; however, their complexity can lead to slow kinetics. This can result in the collapse of the whole circuit.

In this project, you will build synthetic circuits in yeast. To improve the kinetics of the circuit, you will make use of pre-expressed transcription factors, which are translocated into the nucleus. This could theoretically overcome the time limitation of transcription and translation of the parts within the circuit and therefore lead to highly improved kinetics of the whole circuit. To do so, the transcription factors will be fused with small peptides (SynZips), which can bind to each other. To get the system running, you will combine SynZips and the transcription factors with nuclear-export signals (NES) and nuclear-location signals (NLS).

#### Prerequisites:

- Knowledge of molecular biology
- Good spoken and written English
- Experience working in a wet lab environment is advantageous

For further information, please contact Maik Molderings.

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