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Bioprocess facility for test of Engineered CHO cell lines in Single-use bioreactors

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The CHO project group

CHO project group (Scientific and CORE sections) focus is to develop new cell lines with improved homogenous glycosylation of product, titer/yield, growth profile, together with improved downstream processing. In the CORE section the findings of the CHO scientific sections are translated into an industrial relevant context by high throughput generation and screening of genetically manipulated CHO cell lines through an iterative loop. To evaluate whether or not the genetic manipulations improved cell performance, the cell are rigorously tested within the Bioprocess facility.

The iterative loop

- "Omics" analysis
  - Protein Expression
  - Product quality
- Data analysis
  - gDNA design
- Protein Chemistry & Analytics
- Molecular Construction
- RNA's miSeq
- KI Genes
- Cell line engineering
- Cell characterization

Key Activities/Deliveries of the Bioprocess Facility

- Development and description of standard fed-batch bioprocess for test.
- Verification of new cell performance including: bioprocess reproducibility, cell line robustness, product quality (product stability and glycosylation pattern) and yield/titer.
- To generate cultivations data for mathematical modelling of growth, morphology, apoptosis, transcript-omics, metabolomics, proteomics, glycomics, fluxomics.

Cell lines tested in 250 mL DASgip Bioreactors

- Viable cell conc. and lactate accumulation in WT & KO CHO cells
- Viable cell conc. and lactate accumulation in WT and KO CHO cells
- Viable cell conc. and IgG conc. in WT and KO CHO cells

The perspectives

The CHO Scientific and Core sections at Center for Biosustainability (CFB) operate in the space between industry and university, performing basic research aimed at publications as well as translational research aimed at commercialization (e.g. out-licensing, establishment of spin-off companies etc.). The CHO project at CFB is constantly looking for collaborators to initiate projects for the benefit of both parties and for the CHO-based industrial production of therapeutic proteins.