

Oral Presentation

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## Environment matters – An *E. coli* case study. How process technology affects cell physiology and product quality/quantity

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What matters most?? Genes or environment? Of course, both matter, but environment matters more. "Bad genes" can be overcome in an adequate environment and "good genes" can be suppressed under inappropriate conditions.

The impact of process technology on cell physiology and product quality/quantity will be discussed using a comprehensive systems biotechnology approach. Production of a recombinant human growth factor in small-scale shaker flasks, as well as in batch and industrial relevant fed-batch cultures using different induction strategies will be evaluated using proteome, transcriptome, metabolome and fluxome profiling techniques. The results clearly show that the commonly observed responses towards induced recombinant protein production such as growth rate reduction, changes in cell morphology, induction of stress responses and corresponding alterations in gene expression profiles, as well as alterations of central catabolic and anabolic activities strongly depend on, and thus can be effectively manipulated by the environmental conditions to achieve the goal of product formation as desired.