

Poster Presentation

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## Comparative transcriptional profiling of the bacterial stress response in temperature and chemically-induced recombinant *E. coli* processes

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### Background

Production of heterologous proteins results in a number of metabolic and physiological changes in the host cells during the course of a production process, namely the induction of stress responses and corresponding alterations in gene expression profiles [1].

### Results

This study focuses on quantitative monitoring of the adaptation of *E. coli* to recombinant protein production on the transcriptome level by a bead-based RNA sandwich hybridisation assay, a rapid novel method based on the detection of hybridisation events between specific oligonucleotide probes and the target nucleic acids [2,3].

The expression profiles of selected genes including the product gene, anabolic and stress responsive genes were quantitatively analyzed in cells producing the human basic fibroblast growth factor (hFGF-2), a protein that partially aggregates into inclusion bodies. Transcriptome profiles during temperature- and IPTG-induced synthesis of hFGF-2 using the K12 strain TG1 and BL21(DE3) as production hosts, respectively, were compared.

### References

1. Hoffmann F, Rinas U: **Stress induced by recombinant protein production in *Escherichia coli***. *Adv Biochem Eng Biotechnol* 2004, **89**:73-92.
2. Gabig-Ciminska M, Holmgren A, Andresen H, Barken K, Wümpelmann M, Albers J, Hintsche R, Breitenstein A, Neubauer P, Los M, et al.: **Electric chips for rapid detection and quantification of nucleic acids**. *Biosens Bioelectron* 2004, **19**:537-546.

3. Soini J, Falschlehner C, Mayer C, Böhm D, Panula J, Vasala A, Neubauer P: **Transient increase of ATP as a response to temperature up-shift in *Escherichia coli***. *Microb Cell Fact* 2005, **4**:9.