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Lactate reduction in CHO cell cultures through metabolic analysis

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1. Lactate generation in CHO cell cultures

CHO cells display Warburg metabolism characterized by high lactate production, which ultimately inhibits cell growth in culture. The current study explored through metabolic flux analysis both process and cell engineering approaches to avoid lactate accumulation, with potential implications in the industry of bioproducts.

2. Background and Experimental Data

The metabolic profile of CHO cells was investigated in batch bioreactor cultures performed under three conditions.

3. Experimental Overview and Results

**ICHO Genome-Scale Metabolic Model**

4683 reactions

**Model Reduction**

Core Metabolism

239 reactions

**Constrained-Based Modelling**

**Flux Balance Analysis**

**Dynamic Flux Balance Analysis**

**Transcriptomics**

**Proteomics**

**Metabolomics**

**Exo-Metabolomics**

**Conventional metabolism**

**Bioprocess Engineering**

**Cell engineering**

**Suppression of lactate generation**

**Glucose uptake**

**Oxygen Uptake Rate**

**Pyridine nucleotide**

**Energy Charge**

**(EC)=[ATP]+1/2[ADP]/[ATP]+[ADP]+[AMP]**

**Concentrations are in fmols/cell**

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