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Bio-based Production of L-Methionine in Corynebacterium glutamicum

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Cuvillier Verlag Sep 2010, 2010. Taschenbuch. Condition: Neu. Neuware - In the present work, Corynebacterium glutamicum pathways of the central metabolism were investigated from a systems-oriented view regarding a detailed understanding of the underlying reaction network towards future biotechnological production of L-methionine. The physiological characterization of the anabolic network of mutants, specifically designed for these studies, was achieved by combining fluxomics and metabolomics after rigorous validation of existing technologies, especially for metabolite analysis, and development of novel efficient protocols adapted to C. glutamicum. Above all, a lack of suitable sampling methods in the field of metabolomics was identified by validation of common protocols, not only for C. glutamicum, but also for various microorganisms including biotechnological important bacteria and yeasts. Based on these findings, a novel differential approach was developed and validated, whereby intracellular levels are determined via differential analysis of total broth and culture filtrate without cells. Applying this method, the existence of a novel threonine-independent pathway for isoleucine biosynthesis starting from homolanthionine was identified in C. glutamicum mcbR. This pathway withdraws significant amounts of carbon from the methionine biosynthesis. Subsequent studies identified the availability of NADPH as additional limiting step. In C. glutamicum mcbR, a deletion mutant with a...


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