Process strategies to improve heterologous protein production in Escherichia coli under lactose or IPTG induction - DTU Orbit (28/12/2018)

Process strategies to improve heterologous protein production in Escherichia coli under lactose or IPTG induction

Cells of Escherichia coli BL21 bearing the chicken muscle Troponin C (TnC) gene under the control of the lacUV5 promoter were induced under different cultivation conditions and the consequences on growth and cell protein content were investigated. The type of inducer molecule (lactose or IPTG), the average carbon source concentration (0.0-10.6 g l(-1)), the specific growth rate at the beginning of induction (0.20-0.54 h(-1)), and the cell concentration at the beginning of induction (3.2-36.5 g l(-1)) were varied. The highest value for the intracellular level of the target protein (TnC(X)), 110 mg per gram dry cell weight (DCW), was achieved when isopropyl-beta-D-thiogalactoside (IPTG) was the inducer. Under lactose induction, a value of 96 mg per gram DCW was attained. However, the high metabolic load imposed by IPTG, when compared with lactose induction, as assessed by the cell protein content and stability, indicates that lactose is probably the most appropriate inducer for the synthesis of this heterologous protein. (C) 2000 Elsevier Science Ltd. All rights reserved.

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