Glycoprofiling effects of media additives on IgG produced by CHO cells in fed-batch bioreactors

Therapeutic monoclonal antibodies (mAbs) are mainly produced by heterologous expression in Chinese hamster ovary (CHO) cells. The glycosylation profile of the mAbs has a major impact on the efficacy and safety of the drug and is therefore an important parameter to control during production. In this study, the effect on IgG N-glycosylation from feeding CHO cells with eight glycosylation precursors during cultivation was investigated. The study was conducted in fed-batch mode in bioreactors with biological replicates to obtain highly controlled and comparable conditions. We assessed charge heterogeneity and glycosylation patterns of IgG. None of the eight feed additives caused statistically significant changes to cell growth or IgG productivity, compared to controls. However, the addition of 20 mM galactose did result in a reproducible increase of galactosylated IgG from 14% to 25%. On the other hand, addition of 20 mM N-acetyl-D-glucosamine (GlcNAc) reduced relative abundance of galactosylated IgG by 4%. Additionally, supplementation with 10 mM mannose slightly reduced GlcNAc occupancy of IgG. Overall, comparing the effects of IgG glycosylation, by supplementing the cell culture medium with glycosylation precursors during cultivation, revealed an application of these glycosylation precursors for modulating N-glycosylation of IgG.

General information
Publication status: Published
Organisations: Department of Systems Biology, Novo Nordisk Foundation Center for Biosustainability, Network Engineering of Eukaryotic Cell Factories, Symphogen A/S
Number of pages: 8
Pages: 359-366
Publication date: 2016
Peer-reviewed: Yes

Publication information
Journal: Biotechnology and Bioengineering (Print)
Volume: 113
Issue number: 2
ISSN (Print): 0006-3592
Ratings:
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 4.14 SJR 1.447 SNIP 1.178
Web of Science (2016): Impact factor 4.481
Web of Science (2016): Indexed yes
Original language: English
Keywords: Glycosylation, Chinese hamster ovary cells, Fed-batch, IgG, Medium additives
DOI: 10.1002/bit.25715
Source: PublicationPreSubmission
Source-ID: 113909250
Research output: Contribution to journal › Journal article – Annual report year: 2015 › Research › peer-review