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Production of sialylated monoclonal antibody in CHO cells

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IgGs that possess Fc-glycans with terminal sialic acid (SA) are thought to be responsible for the anti-inflammatory properties of intravenous immunoglobulins (IVIGs) through a mechanism that is still unclear. The impact of this sialylation on IgG's effector functions (ADCC and CDC) also remains to be elucidated. To better understand the biological impact of IgG sialylation, there is a need to produce recombinant IgGs with well characterized and more homogeneous glycan structures. The type of SA (NANA or NGNA), the nature of its linkage with the galactose residue (alpha-2,3 or alpha-2,6) or the number of glycan antennae being sialylated, may vary according to the IgG subtype, the host cell in which it is expressed and the cell culture environment. In this study, we show that the a 2,6-sialylation of IgG1's Fc domain can be efficiently achieved by the transient co-expression of the human beta 1,4-galactosyltransferase-1 (GT) and 2,6-sialyltransferase-1 (ST6) in CHO cells. The process allows for the production of milligram amounts of human-like sialylated monoclonal antibody within two weeks. The impact of this sialylation on IgG1 binding to FcγRIIIa is also presented.

Biography

Yves Durocher is a Research Officer at the National Research Council of Canada since 1995. He obtained his PhD in Biochemistry at the Université de Montréal in 1993. He manages the NRC's Mammalian Cell Culture Section which is composed of 33 scientists involved in protein expression and CHO cell line development for internal projects and external clients. His research activities have been focused on the development the of large-scale transient gene expression (LSTGE) platforms using HEK293 and CHO cells for protein production and on the development of stable CHO pool and clonal cell line platforms for the manufacturing of recombinant therapeutic proteins. He also contributed to ~100 scientific publications in peer-reviewed journals.

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