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Humanizing recombinant glycoproteins from Chinese hamster ovary cells

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With new tools for gene-editing like zinc-fingers, TALENS and CRISPR[1], it is now feasible to tailor-make[2] the N-Glycoforms for therapeutic glycoproteins that have previously been almost impossible. We here demonstrate a case of humanizing a recombinant human glycoprotein that in Wild type (WT) Chinese hamster ovary (CHO) cells are making a very heterogeneous mixture of N-Glycans (see Figure 1). We speculate that the CHO pattern of N-Glycans would affect half-life and/or efficacy of the glycoprotein in the bloodstream making it unsuitable for human intravenous use, whereas our humanized version would be identical to the native human glycoprotein.

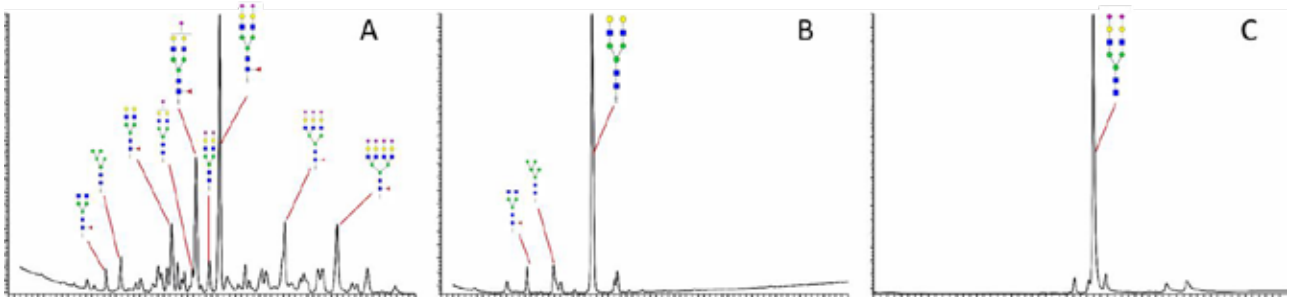

Figure 1. Fluorescence trace from LC-MS run of RapiFlour labelled N-Glycans, released from purified glycoprotein. Heterogeneous N-Glycans from glycoprotein produced in CHO-WT (A). Glycoprotein produced in CHO-KO strain produces a much more homogenous pattern of N-Glycans (B). The N-Glycan pattern target for this work; N-Glycan pattern of Human plasma glycoprotein (C).

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