



Description

Recombinant MOAβT lectin (*marasmus oreades*) recognises with micromolar range affinity, the so-called xenotransplantation antigens (Galili) with terminal Galα(1,3)Galβ epitope¹. These epitopes, synthesized by a specific α1-3 galactosyltransferase are expressed by all mammals except humans, apes and old-world monkeys. The presence of anti-Galα(1,3)-Galβ antibodies (IgE) in human serum is a major barrier to the use of porcine and other non-primate tissues and organs for xenotransplantation into humans. Moreover, this is also an obstacle for the production of biotherapeutics in non-human mammalian cell lines, such as murine myeloma cells. The case of the Cetuximab monoclonal antibody, which is produced in these type of cells, was a striking case of hypersensitive reaction among patients due to the Galili antigen.

Applications

➔ **Detection of undesirable glycans on biotherapeutics**

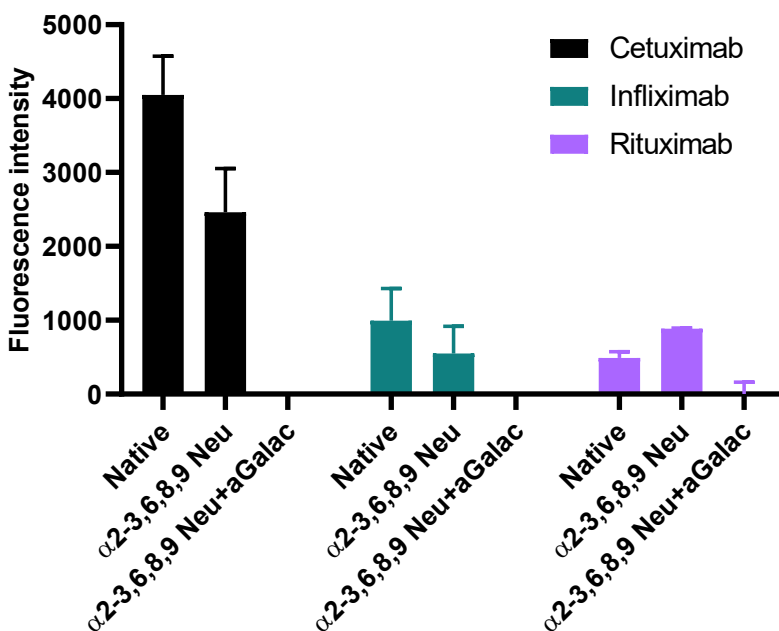
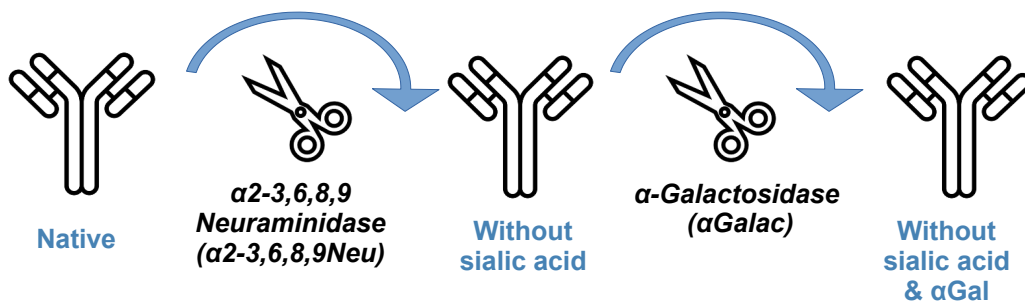
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Galili LEctPROFILE® kit was used to highlight the undesirable glycans Galα1,3Gal on biotherapeutics. In this example, we demonstrated the presence of this epitope on the Cetuximab monoclonal antibody (by comparison with the others monoclonal antibodies Retuximab and Infliximab that don't have Galα1,3Gal, See *Table* below).

Name	Clinical use	Production	Glycosylation profil (N-glycans)
Cetuximab (Erbix®)	Treatment of metastatic colorectal cancer and head and neck cancer	Murine myeloma cells	- High Man & hybrid structures. - Complex : G0F, G1F, G2 Low level of : G2FGal1 (Galili epitope) and NGNA sialic acid.
Infliximab (Remicade®)	Chron's disease, Rheumatoid Arthritis, Ankylosing Spondylitis, Psoriatic arthritis	Mouse myeloma cells (SP2/0 cells)	- High Man (M5, M6) - Hybryde (M3G0F) - Complex (G1, G1F, G2, G2F) No Galili epitope and sialic acid.
Rituximab (Rituxan®)	Treatment of patients with stage III-IV follicular lymphoma who are chemoresistant or are in their second or subsequent relapse after chemotherapy	Chinese Hamster Ovary cells	- Complex : G0, G1F, G2F Low levels of high Man and NANA sialic acid.

To prove the presence/absence of this epitope, we measured the interactions of this three biotherapeutics with MOAβT on the native form and after enzymatic treatments (removal of sialic acid motifs and α-galactose respectively by α2-3,6,8,9 neuraminidase and α-galactosidase). Indeed, as we see on the *Figure* presented on the next page, only Cetuximab show interaction with MOAβT.





References

1. Tangvoranuntakul, P., Gagneux, P. Diaz, S., Bardor, M., Varki, N., Varki, A., Muchmore, E, *Human uptake and incorporation of an immunogenic nonhuman dietary sialic acid*. *PNAS*, **2003**, *100*, 12045-12050.
2. F. Vena, LEctPROFILE kits: towards quality control and new potential applications, GLYcoDiag, thesis defence, 13th Décembre 2022, Orléans.