α2,3_α2,6 LEctPROFILE® kit

Reference : LK05α2,3_α2,6

Technical Note

GLYCODIAG

Applied Glycomics

α2,3_α2,6 LEctPROFILE® kit (Reference: LK05α2,3_α2,6)

Description

The α2,3_α2,6 LEctPROFILE® kit is designed to study the sialylation and more precisely the ratio α2,3/α2,6 of sialic acid motifs. Indeed, the kit is composed of two specific lectins: (1) the *Sambucus Nigra* Agglutinin (SNA) that binds preferentially to sialic acid α-2,6 Gal (found in N-glycans) or sialic acid α-2,6 GalNAc (found in O-glycans) but not on sialic acid α-2,3 Gal oligosaccharides, and (2) the *Maackia amurensis* leukoagglutinin (MAA) is inhibited by low concentration of 2,3-sialyllactose (NeuAc2,3Galβ1,4Glc), but not inhibited by either 2,6-sialyllactose or free NeuAc.

Applications

➡ **α2,3/α2,6 ratio determination of glycoproteins**

Aguedo, J. *et al.*[1]

The ratio α2,3/α2,6 sialic acid motifs was determined through reference glycoproteins (fetuin and transferrin) known to have specific sialic acid structures and compared to the MALDI-TOF/MS results. The interactions of these glycoproteins with SNA and MAA lectins were performed on the native form, or after neuraminidase treatments *(See graphes next page)*.
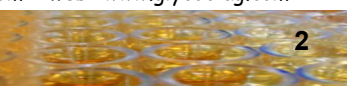
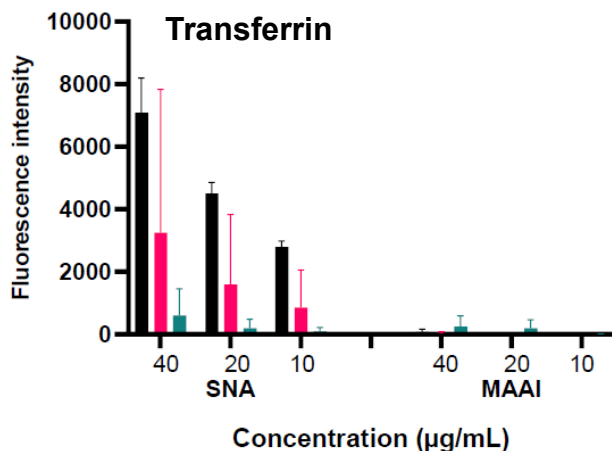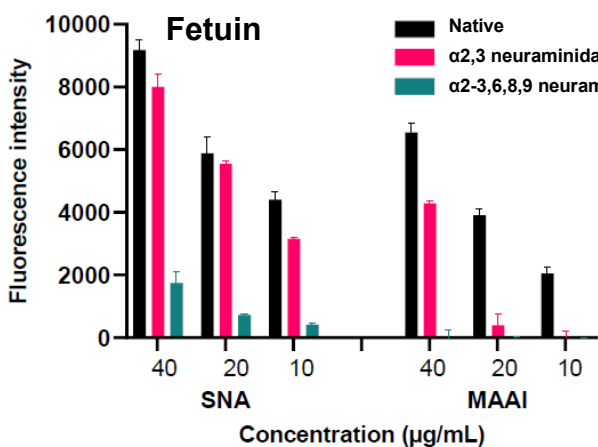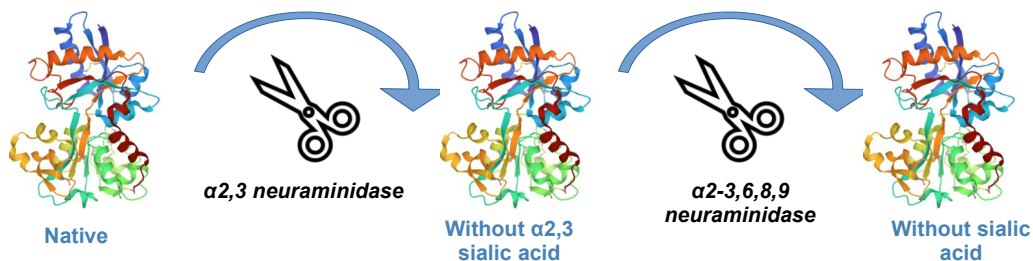| Name	Glycosylation profil according to literature
Fetuin from foetal calf serum (BioRad, Ref :4430-2204)	- 3N- an 3 O-linked (mucine-type)glycans. - Complex glycans with NeuAc (α2,6 & α2,3)
Human Transferrin (Sigma Aldrich, Ref T3309)	- 2 N-linked complex glycans containing NeuAc (α2,6 & α2,3)

Results

<u>Fetuin</u>: - The α2,3/α2,6 sialic acid ratio obtained is 46:54. This ratio is in total accordance with the bibliography that report value of α2,3/α2,6 on fetuin from 38:62 to 49:51.

<u>Transferrin</u>: - None of α2,3 structures were detected due to the absence of interaction with MAA. However, transferin is known to have α2,3 motifs. Our hypothesis for the absence of interaction with MAA, is due to a lack of accessibility of the α2,3 glycan structures on native glycoprotein. Indeed, after the treatment of transferrin in denaturing conditions, we observed on the denatured transferrin interactions with MAA that confirm the presence of α2,3 glycans.

The use of α2,3_α2,6 LEctPROFILE® kit is a complementary method to the structural analysis that enable to clearly identify the glycan motifs accessible on glycoproteins for biological interactions.

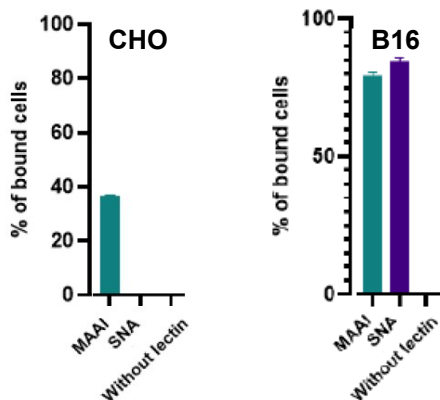**GLYcoDiag**, *Orléans – France*   **Phone:** +33 (0) 9 72 50 13 36   **e-mail:** contact@glycodiag.com   **web:** www.glycodiag.com

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Native → α2,3 neuraminidase → Without α2,3 sialic acid → α2-3,6,8,9 neuraminidase → Without sialic acid

Cells glycosylation study

Vena, F. et al.[2]

The α2,3_α2,6 LEctPROFILE® kit is an easy tool to follow the glycosylation profil of cells due to it's high specificity of recognition for α2,3 and α2,6 sialic acid motifs. For example CHO cells are known to express only α2,3 glycans. In other part, melanoma B16 is a murine tumour cell line used for research as a model for human skin cancers. Both sialic acid residues are expressed on these cells. The interactions obtained with α2,3_α2,6 LEctPROFILE® kit with CHO and melanoma B16 are in total accordance with the sialylation data. As it is know that the sialylation profiles are evolving during the cancer, the α2,3_α2,6 LEctPROFILE® kit constitutes a powerful way to follow the progression of the disease.

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➡️ **Follow the sialylation level of IgG contained in biological fluid**

Li, D. et al.[3]

Recently, it was proved that the IgG sialylation level of a wide variety of autoimmune diseases changes during the development and progression of the disease. Indeed, low levels of sialylated IgG glycans in serum have been reported as glycobiomarkers in a number of autoimmune diseases.

The α2,3_α2,6 LEctPROFILE® kit can be used to :

   - facilitate diagnosis by measurement of sialylation level of IgG contained in serum of patients ;

   - monitor disease progression ;

   - evaluate therapeutic efficacy of a strategy used to recover the sialylation level.
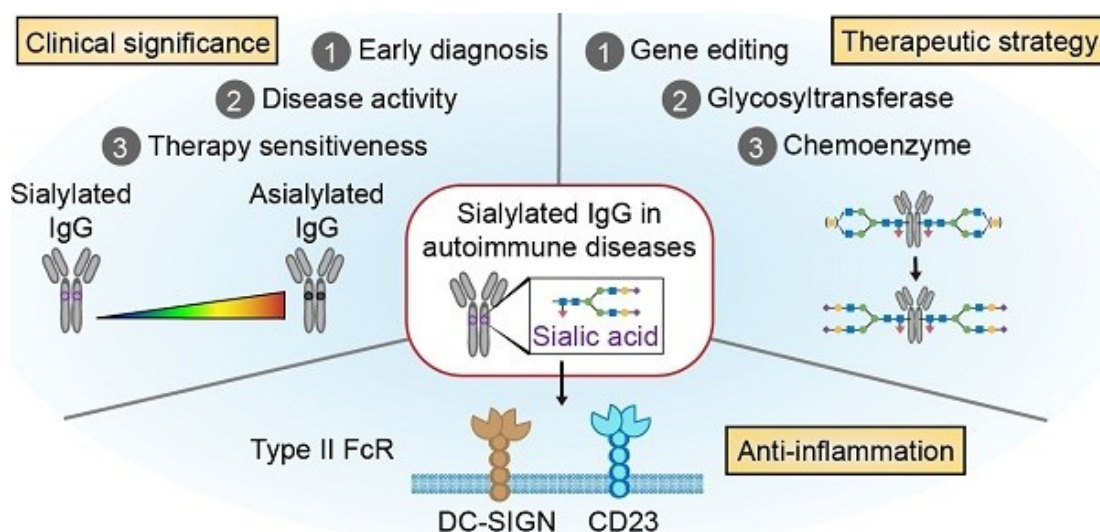
References

1. J. Aguedo, F. Vena, L. Landemarre, J. Tkac, Rapid and high-throughput methods for discrimination of sialic acid linkages in glycoproteins, Group Français des Glycosciences, **2022**, France.

2. F. Vena, LEctPROFILE kits: towards quality control and new potential applications, GLYcoDiag, thesis defence, 13th Décembre 2022, Orléans.

3. D. Li, Y. Lou, Y. Zhang, S. Liu, J. Li. *Sialylated immunoglobulin G: a promising diagnostic and therapeutic strategy for autoimmune diseases, Theranostics*, **2021**, *11*, 5430-5446.