

Ludger

## Certificate of Analysis

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### Fetuin Glycan Library

Cat. #: CLIBN-FETUIN-01

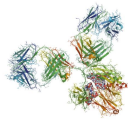
Batch #: B227-05

Size: ~7.5µg

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- Description:** A mixture of bi-, tri-, and tetra-antennary glycan standards with variable sialylation released from fetuin glycoprotein.
- Source:** The glycans in this product are released from a fetuin standard that is purified from fetal calf serum. Fetuin is a glycoprotein present in the circulation which is synthesized by hepatocytes. Fetuin exists in a variety of glycoforms containing bi-, tri-, and tetra-antennary oligosaccharides with variable sialylation.
- Form:** Dry. Lyophilised powder.
- Storage:** Refrigerate (-20°C) both before and after dissolving. This product is stable for at least 5 years as supplied.
- Shipping:** The product is shipped at ambient temperature.
- Handling:** Once dissolved avoid repeated thawing and refreezing, storage over 3 h at room temperature or above, exposure to light and long term exposure to acid as these will cause glycan desialylation.
- Safety:** This product is non-hazardous and has been purified from natural sources certified to be free of all hazardous material including pathogenic biological agents.

**For research use only. Not for human or drug use**



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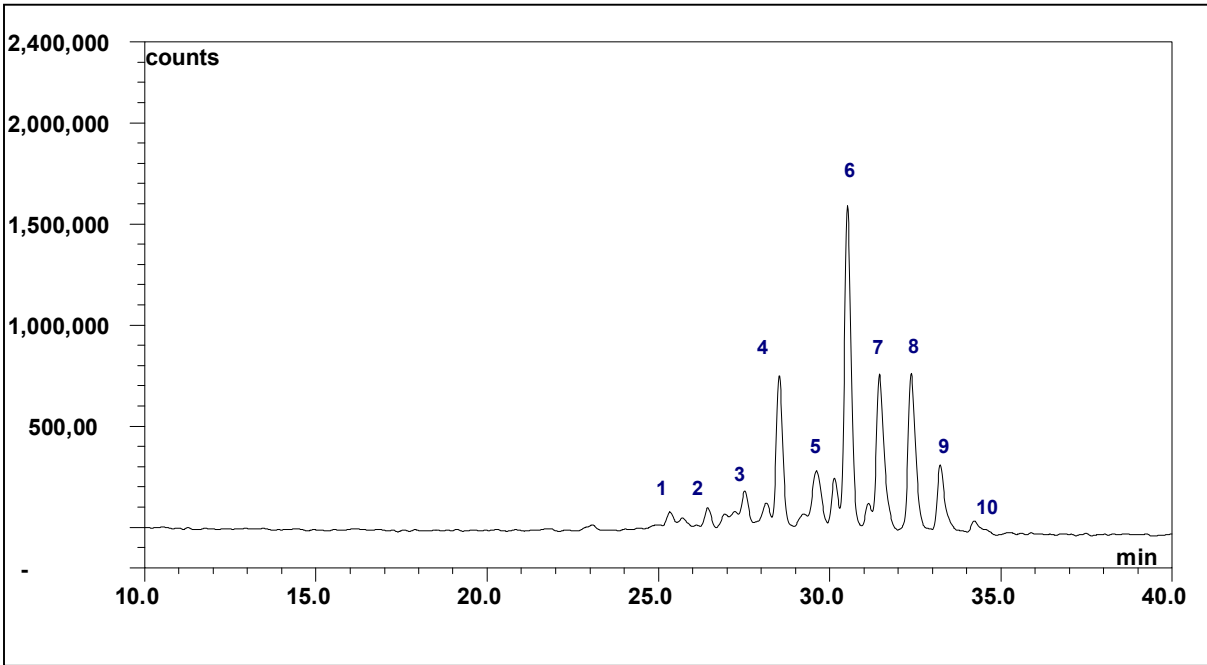


Figure 1: BEH HILIC chromatography profile of 2AB labelled fetuin glycans (CLIBN-FET-01, Batch B227-05).

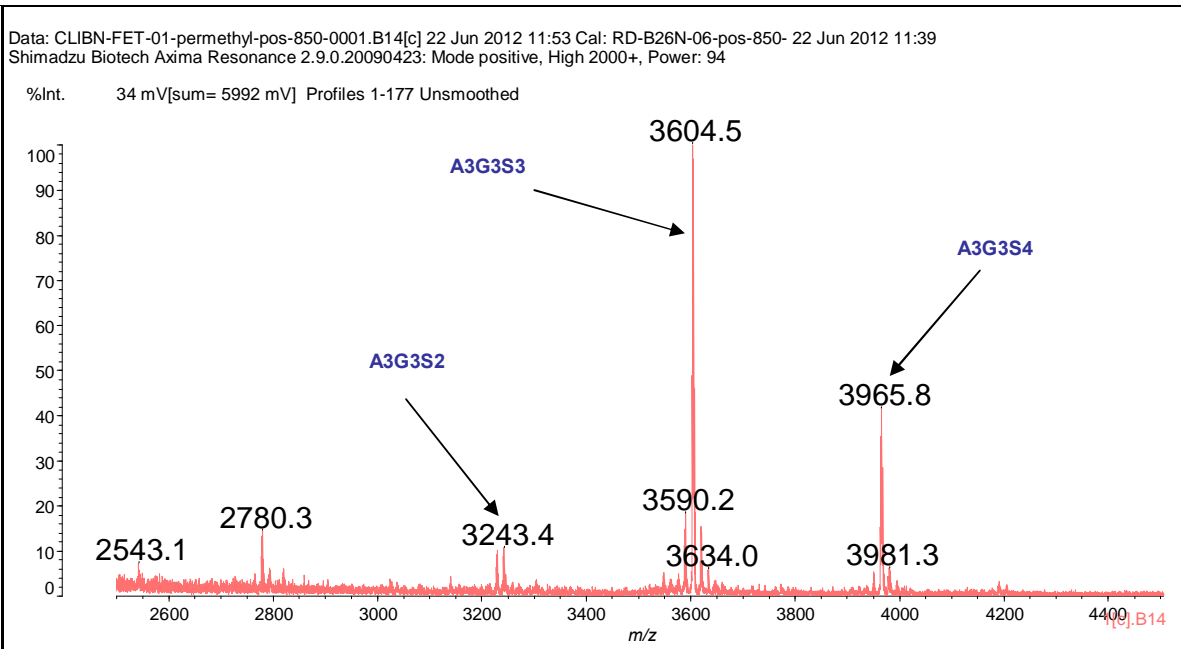
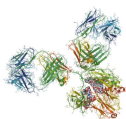


Figure 2: Positive ion mass spectrum of permethylated fetuin glycans (CLIBN-FET-01, Batch B227-05).



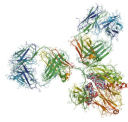
Peak Number	Assignment	Relative Amount (%)
1	A3G	1.5
2/3/	A3G2S2, A3G3S1, A3G3S2	16.5
5	A3G3S2, A3G2S3	6.0
6	A3G3S3, A3G3S4	26.
7/8	A3G3S3, A3G2S4	30.
9	A3G3S3, A3G3S4	6.2
10	A3G3S3, A3G3S4	1.5

Sialylated state	Relative Percentage (%)
Neutral	Non-detected
Monosialylated	3
Disialylated	21
Trisialylated	65
Tetrasialylated	25

**Table 1: Summary of bovine fetuin N-glycans.** See the end of this document for details of the glycan nomenclature used. Many common N-glycans have similar reported GU values. Due to the heterogeneous nature of the sample variations in the linkage type of a sialic acid will cause variations in column retention times. A combination of GU value, mass spectrometry and exoglycosidase digestion can be used to unambiguously identify most N-glycans. For a more complete analysis of bovine fetuin, see the CofA provided for GCP-Fet-50.

## Structure Abbreviations

All N-glycans have two core GlcNAcs; F at the start of the abbreviation indicates a core fucose, (6) after the F indicates that the fucose is  $\alpha$ 1-6 linked to the inner GlcNAc; Mx, number (x) of mannose on core GlcNAcs; Ax, number of antenna (GlcNAc) on trimannosyl core; A2, biantennary with both GlcNAcs as  $\beta$ 1-2 linked; A3, triantennary with a GlcNAc linked  $\beta$ 1-2 to both mannose and the third GlcNAc linked  $\beta$ 1-4 to the  $\alpha$ 1-3 linked mannose; A3q triantennary with a GlcNAc linked  $\beta$ 1-2 to both mannose and the third GlcNAc linked  $\beta$ 1-6 to the  $\alpha$ 1-6 linked mannose; A4, GlcNAcs linked as A3 with additional GlcNAc  $\beta$ 1-6 linked to  $\alpha$ 1-6 mannose; B, bisecting GlcNAc linked  $\beta$ 1-4 to  $\beta$ 1-3 mannose; Gx, number (x) of linked galactose on antenna, (4) or (3) after the G indicates that the Gal is  $\beta$ 1-4 or  $\beta$ 1-3 linked; [3]G1 and [6]G1 indicates that the galactose is on the antenna of the  $\alpha$ 1-3 or  $\alpha$ 1-6 mannose; Sx, number (x) of sialic acids linked to galactose; the numbers 3 or 6 in parentheses after S indicate whether the sialic acid is in an  $\alpha$ 2-3 or  $\alpha$ 2-6 linkage.



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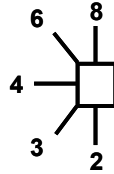
*Symbol for sugar*

- Glc
- GlcNAc
- ★ NeuNAc
- ◇ Gal
- ◆ GalNAc
- ◊ Fuc (deoxy galactose)
- Man

*Fluorescent label*

—2AB 2-aminobenzamide

*Linkage position*



*Linkage type*

- $\beta$ -linkage
- .....  $\alpha$ -linkage
- ~ unknown  $\beta$ -linkage
- ⋯ unknown  $\alpha$ -linkage

Figure 3: Symbols used to depict glycan structures



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**This product is intended for *in vitro* research only.**

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