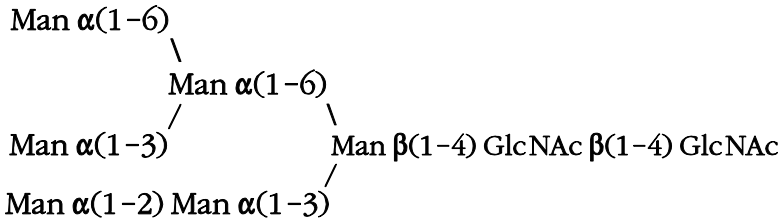
CERTIFICATE OF ANALYSIS

PRODUCT NAME:	GLYKO® OLIGOMANNOSE 6 N-GLYCAN (MAN-6)
PRODUCT CODE:	GKM-002600
LOT NUMBER:	DP12J2202
PACK SIZE:	10 µg
PURITY:	≥90% of glycan by HPLC
FORM:	Dry solid
STORAGE:	Store at -20°C before and after reconstitution
EXPIRATION:	November 2017, may be used for 1 year after reconstitution

STRUCTURE:



QUALITY CONTROL:

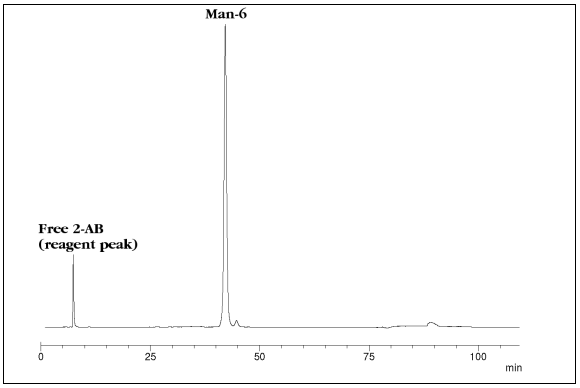


Figure 1 - HPLC of 2-AB labeled Man-6

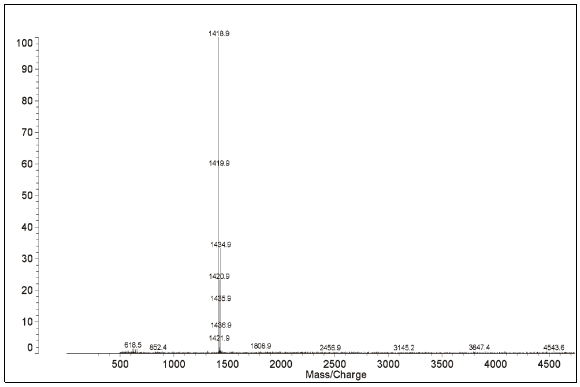


Figure 2 - MALDI-TOF mass spec of Man-6 $[M - H]^+$

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Molecular Weight: 1397.3 (average)[1]

Isolation: Man-6 oligomannose-type N-linked oligosaccharide is typically released from a glycoprotein using N-Glycanase® or anhydrous hydrazine[7], separated from peptide material by adsorption chromatography, then purified further using a combination of chromatographic techniques.

Structural Analysis: The purity and structural integrity of the glycan is assessed by one or more of the following techniques: HPLC[2], mass spectrometry[3,4], ^{1}H-NMR[5] and HPAE-PAD[6].

Applications:

- qualitative standard for various analytical procedures
- radio-labeling, fluorescent-labeling or formation of a variety of oligosaccharide derivatives
- substrate for glycosidase and glycosyl transferase assays

Reconstitution: Use HPLC-grade water or an aqueous buffer to dissolve the glycan. Recommend storage at -20°C in working aliquots. Avoid multiple freeze/thaw cycles.

Handling: The oligosaccharide is shipped as a dried solid. Allow the unopened vial to reach ambient temperature and tap on a solid surface to ensure that most of the material is at the bottom of the vial. Gently remove the cap, add the desired volume of water or buffer, re-cap and mix thoroughly to redissolve all the oligosaccharide. For maximal recovery, ensure that the cap lining is also rinsed and centrifuge the reconstituted vial briefly before use.

Make sure that any glassware, plasticware, solvents or reagents which come into contact with the glycan are free of glycosidases and carbohydrate contaminants.

Minimize exposure to elevated temperatures or extremes of pH; high temperatures or low pH may cause degradation. High pH will cause epimerization of the reducing terminal GlcNAc.

REFERENCES

1. Average molecular weight was calculated using ExPASy (http://us.expasy.org/tools/glycomod/glycanmass.html)
2. Guile GR, Rudd PM, Wing DR, Prime SB, Dwek RA. A rapid and high-resolution high-performance liquid chromatographic method for separating glycan mixtures and analyzing oligosaccharide profiles. Anal Biochem. 1996;240:210-226.
3. James DC, Jenkins N. Analysis of N-glycans by matrix-assisted laser desorption/ionization mass spectrometry; in A laboratory guide to glycoconjugate analysis. BioMethods 9 (Jackson P, Gallagher JT, ed). 1997;91-112.
4. Papac DI, Wong A, Jones AJS. Analysis of acidic oligosaccharides by matrix-assisted laser desorption/ionization time of flight mass spectrometry. Anal Chem 68: 1996;3215-3223.
5. Vliegenthart JFG, Dorland L, van Halbeek H. High-resolution, ^{1}H-nuclear magnetic resonance spectroscopy as a tool in the structural analysis of carbohydrates related to glycoproteins. Adv Carb Chem Biochem 1983;41:209-374.
6. Townsend RR, Hardy MR, Hindsgaul O, Lee YC. High-performance anion-exchange chromatography of oligosaccharides using pellicular resins and pulsed amperometric detection. Anal Biochem 1988;174:459-470.
7. Takasaki S, Mizouchi T, Kobata A. Hydrazinolysis of asparagine-linked sugar chains to produce free oligosaccharides. Meth Enzymol 1982;83:263-268.

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Authorized Signature