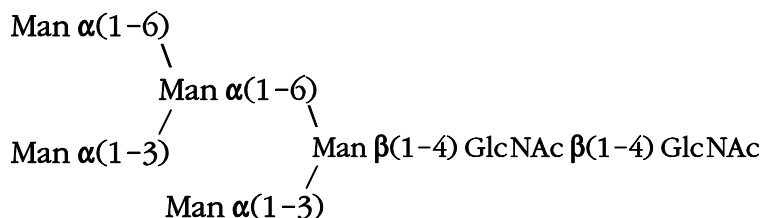




CERTIFICATE OF ANALYSIS

PRODUCT NAME: GLYKO[®] OLIGOMANNOSE 5 N-GLYCAN (MAN-5)
PRODUCT CODE: GKM-002500
LOT NUMBER: DP08J0201f
PACK SIZE: 10 µg (qualitative standard for glycan identification)
PURITY: ≥90% of glycan by HPLC
FORM: Dry solid
STORAGE: Store at -20°C before and after reconstitution
EXPIRATION: November 2018, may be used for 1 year after reconstitution

STRUCTURE:



MOLECULAR WEIGHT: 1235.1 (average)¹

Quality Control:

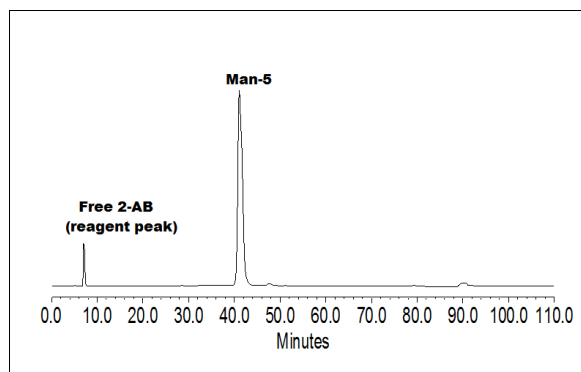


Figure 1 - HPLC results:

Man-5 labeled according to the Signal™ 2-AB Labeling Kit (GKK-404) and analyzed on a GlycoSep™ N column (GKI-4728) in ammonium formate/acetonitrile.

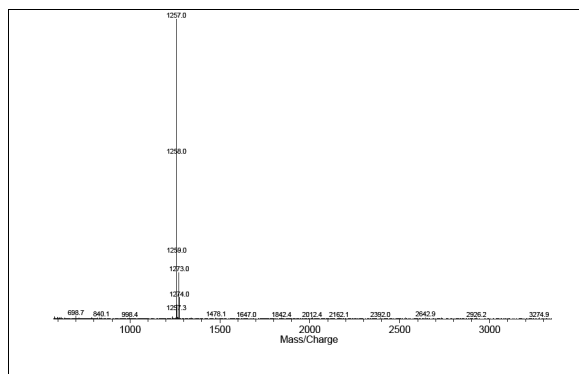


Figure 2 - MALDI-TOF MS of Man-5 [M + Na]⁺

Example of UPLC Results:

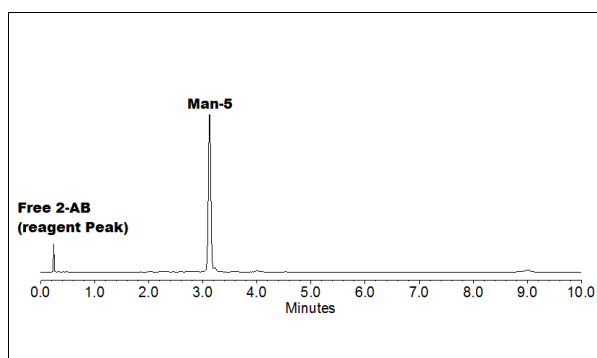


Figure 3 - MAN-5 labeled with 2-AB and analyzed on a Waters ACQUITY® UPLC® BEH Glycan column (1.7 μm, 2.1 x 100 mm) in ammonium formate/acetonitrile.

Isolation: Man-5 oligomannose-type N-linked oligosaccharide is typically released from a glycoprotein using N-Glycanase® or anhydrous hydrazine⁸, 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: HPLC², mass spectrometry^{3,4}, FACE⁵, ¹H-NMR⁶ and HPAEC-PAD⁷.

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. Store the reconstituted glycan 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 will cause desialylation. High pH will cause epimerization of the reducing terminal GlcNAc.

REFERENCES

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<http://us.expasy.org/tools/glycomod/glycanmass.html>
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3. James DC and Jenkins N. Analysis of N-glycans by matrix-assisted laser desorption/ionization mass spectrometry. In: Jackson P, Gallagher JT, editors. *A laboratory guide to glycoconjugate analysis*, BioMethods Vol. 9. Basel: Birkhäuser; 1997. p. 91-112.
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Authorized Signature