



CIL

Cambridge Isotope Laboratories, Inc.
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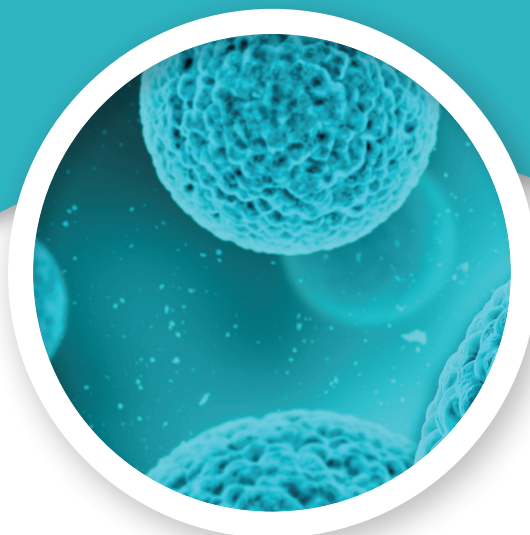
Eurisotop

A CAMBRIDGE ISOTOPE LABORATORIES COMPANY

RESEARCH PRODUCTS

Glycan Standards

For microarrays and the identification/
quantification of glycans



The emerging field of glycomics focuses on the structure and function of glycans in biological systems. Glycans are chained carbohydrates that are free or conjugated to macromolecules, such as proteins (referred to as glycoproteins) or lipids (referred to as glycolipids). They participate in a diverse array of biological processes (e.g., cell signaling, protein folding, and immune recognition) and are implicated in a number of diseases (e.g., oncological, autoimmune, and Alzheimer's). While analytical methodologies for their detection and sequencing have advanced, glycomic research has been hampered by the lack of commercially available standards and research tools.

Cambridge Isotope Laboratories, Inc. (CIL) is pleased to offer high-quality standards to the glycomic research community to aid the detection, identification, and quantification of glycans. Specifically, these can be used as internal standards for mass spectrometry and as starting materials for glyco-microarrays.

The glycan standards available are in $^{13}\text{C}_6$ -labeled and unlabeled forms. These encompass a broad range of categories (e.g., *N*-linked, *O*-linked, and fucosylated) and have been highly characterized using a number of analytical techniques (e.g., ^1H NMR, ESI-MS, and LC-MS). The standards are supplied as purified powders in 500 pmol quantities (bulk quantities available upon request). Please visit www.isotope.com for more information.

CIL, in partnership with Cassia, LLC, is pleased to offer custom synthesis of glycans. Please visit isotope.com to request a custom synthesis quote.

- * Galactose ($^{13}\text{C}_6$; Gal)
- Galactose (Gal)
- *N*-Acetylgalactosamine (GalNAc)
- Glucose (Glc)
- *N*-Acetylglucosamine (GlcNAc)
- Mannose (Man)
- ◆ *N*-Acetylneuraminic acid (Neu5Ac)
- ▲ Fucose (Fuc)

Figure. Symbol nomenclature for glycan standards and unlabeled monosaccharides, as recommended by the glycomics consortium network.¹

Reference

1. Varki, A; Cummings, R.D. et al. **2009.** *Essentials of Glycobiology*, 2nd edition. ISBN-13:9780879697709.



Glycans are synthesized
and tested by Cassia, LLC.

Labeled

Available in 500 pmol units

Catalog No. / Description	Structure	Residues	MW (Da)	Fucosylated	Sialylated	N-Linked	O-Linked	Branched	Linear
CLM-10164-CA GLYCAN-FX1 (galactose- ¹³ C ₆ , 99%)		2	389.25						✓
CLM-10087-CA GLYCAN-F47 (galactose- ¹³ C ₆ , 99%)		2	510.34						✓
CLM-10088-CA GLYCAN-F46 (galactose- ¹³ C ₆ , 99%)		2	547.40						✓
CLM-10059-CA GLYCAN-F77 (galactose- ¹³ C ₆ , 99%)		3	592.44						✓
CLM-10094-CA GLYCAN-F40 (galactose- ¹³ C ₆ , 99%)		3	656.48	✓					✓
CLM-10063-CA GLYCAN-F73 (galactose- ¹³ C ₆ , 99%)		3	693.54	✓					✓
CLM-10096-CA GLYCAN-F38 (galactose- ¹³ C ₆ , 99%)		3	693.54	✓					✓
CLM-10091-CA GLYCAN-F43 (galactose- ¹³ C ₆ , 99%)		3	713.54						✓
CLM-10057-CA GLYCAN-F79 (galactose- ¹³ C ₆ , 99%)		4	738.58	✓					✓
CLM-10109-CA GLYCAN-O2-13C-GAL4 (galactose- ¹³ C ₆ , 99%)		4	754.58					✓	✓
CLM-10051-CA GLYCAN-FX2-13C-GAL4 (galactose- ¹³ C ₆ , 99%)		4	754.58						✓
CLM-10092-CA GLYCAN-F42 (galactose- ¹³ C ₆ , 99%)		3	801.60				✓		✓
CLM-10098-CA GLYCAN-F36 (galactose- ¹³ C ₆ , 99%)		3	838.66				✓		✓

Please visit isotope.com for pricing, ordering, and availability of other glycans.

* Galactose (¹³C₆)
 ● Galactose
 ■ N-Acetylgalactosamine
 ● Glucose
 ■ N-Acetylglucosamine
 ● Mannose
 ◆ N-Acetylneuraminic acid
 ▲ Fucose

Catalog No. / Description	Structure	Residues	MW (Da)	Fucosylated	Sialylated	N-Linked	O-Linked	Branched	Linear
CLM-10129-CA GLYCAN-O6-13C-GAL4 (galactose- ¹³ C ₆ , 99%)		5	900.72	✓			✓	✓	
CLM-10107-CA GLYCAN-F5-13C-GAL4 (galactose- ¹³ C ₆ , 99%)		5	900.72	✓				✓	
CLM-10128-CA GLYCAN-O15-13C-GAL4 (galactose- ¹³ C ₆ , 99%)		5	957.77				✓		✓
CLM-10050-CA GLYCAN-FX3 (galactose- ¹³ C ₆ , 99%)		5	957.77						✓
CLM-10131-CA GLYCAN-O3-13C-GAL4 (galactose- ¹³ C ₆ , 99%)		5	1045.84		✓		✓		✓
CLM-10046-CA GLYCAN-F2-13C-GAL4 (galactose- ¹³ C ₆ , 99%)		5	1045.84		✓				✓
CLM-10108-CA GLYCAN-F3-13C-GAL4 (galactose- ¹³ C ₆ , 99%)		5	1045.84		✓				✓
CLM-10126-CA GLYCAN-O16-13C-GAL6 (galactose- ¹³ C ₆ , 99%)		6	1119.91				✓		✓
CLM-10127-CA GLYCAN-O16-13C-GAL4 (galactose- ¹³ C ₆ , 99%)		6	1119.91				✓		✓
CLM-10049-CA GLYCAN-FX5 (galactose- ¹³ C ₆ , 99%)		6	1119.91						✓
CLM-10130-CA GLYCAN-O5-13C-GAL4 (galactose- ¹³ C ₆ , 99%)		6	1191.98	✓	✓		✓	✓	
CLM-10118-CA GLYCAN-O25-13C-GAL6 (galactose- ¹³ C ₆ , 99%)		7	1323.11				✓		✓
CLM-10119-CA GLYCAN-O25-13C-GAL4 (galactose- ¹³ C ₆ , 99%)		7	1323.11				✓		✓
CLM-10106-CA GLYCAN-F6-13C-GAL4 (galactose- ¹³ C ₆ , 99%)		7	1338.12	✓	✓			✓	
CLM-10124-CA GLYCAN-O17-13C-GAL6 (galactose- ¹³ C ₆ , 99%)		7	1411.17		✓		✓		✓
CLM-10125-CA GLYCAN-O17-13C-GAL4 (galactose- ¹³ C ₆ , 99%)		7	1411.17		✓		✓		✓
CLM-10048-CA GLYCAN-FX8 (galactose- ¹³ C ₆ , 99%)		7	1411.17		✓				✓

Labeled

Available in 500 pmol units

Catalog No. / Description	Structure	Residues	MW (Da)	Fucosylated	Sialylated	N-Linked	O-Linked	Branched	Linear
CLM-10120-CA GLYCAN-O20-13C-GAL6 (galactose- ¹³ C ₆ , 99%)		8	1412.20	✓			✓	✓	
CLM-10121-CA GLYCAN-O20-13C-GAL4 (galactose- ¹³ C ₆ , 99%)		8	1412.20	✓			✓	✓	
CLM-10117-CA GLYCAN-O26-13C-GAL4 (galactose- ¹³ C ₆ , 99%)		8	1485.25				✓		✓
CLM-10116-CA GLYCAN-O26-13C-GAL6 (galactose- ¹³ C ₆ , 99%)		8	1485.25				✓		✓
CLM-10105-CA GLYCAN-F17 (galactose- ¹³ C ₆ , 99%)		9	1558.34	✓				✓	
CLM-10132-CA GLYCAN-N2-13C-GAL6,6' ([galactose- ¹³ C ₆ , 99%] ₂)		9	1653.29			✓		✓	
CLM-10122-CA GLYCAN-O19-13C-GAL6 (galactose- ¹³ C ₆ , 99%)		9	1703.45	✓	✓		✓	✓	
CLM-10123-CA GLYCAN-O19-13C-GAL4 (galactose- ¹³ C ₆ , 99%)		9	1703.45	✓	✓		✓	✓	
CLM-10114-CA GLYCAN-O27-13C-GAL6 (galactose- ¹³ C ₆ , 99%)		9	1776.50		✓		✓		✓
CLM-10115-CA GLYCAN-O27-13C-GAL4 (galactose- ¹³ C ₆ , 99%)		9	1776.50		✓		✓		✓
CLM-10143-CA GLYCAN-N56-13C-GAL6,6' ([galactose- ¹³ C ₆ , 99%] ₂)		10	1799.43	✓		✓		✓	
CLM-10104-CA GLYCAN-F18 (galactose- ¹³ C ₆ , 99%)		10	1849.59	✓	✓			✓	
CLM-10113-CA GLYCAN-O31-13C-GAL4 (galactose- ¹³ C ₆ , 99%)		11	1923.67	✓			✓	✓	
CLM-10112-CA GLYCAN-O31-13C-GAL6 (galactose- ¹³ C ₆ , 99%)		11	1923.67	✓			✓	✓	
CLM-10153-CA GLYCAN-N34-13C-GAL6,6',6'' ([galactose- ¹³ C ₆ , 99%] ₃)		11	2024.52			✓		✓	
CLM-10163-CA GLYCAN-N3-13C-GAL6,6' ([galactose- ¹³ C ₆ , 99%] ₂)		11	2059.67			✓		✓	

* Galactose (¹³C₆)
 ● Galactose
 ■ N-Acetylglucosamine
 ● Glucose
 ■ N-Acetylglucosamine
 ● Mannose
 ◆ N-Acetylneuraminic acid
 ▲ Fucose

Catalog No. / Description	Structure	Residues	MW (Da)	Fucosylated	Sialylated	N-Linked	O-Linked	Branched	Linear
CLM-10137-CA GLYCAN-N68-13C-GAL6,6',6'' ([galactose- ¹³ C ₆ , 99%] ₃)		12	2170.66	✓		✓		✓	
CLM-10142-CA GLYCAN-N57-13C-GAL6,6' ([galactose- ¹³ C ₆ , 99%] ₂)		12	2205.81	✓		✓		✓	
CLM-10110-CA GLYCAN-O33-13C-GAL6 (galactose- ¹³ C ₆ , 99%)		12	2214.93	✓	✓		✓	✓	
CLM-10111-CA GLYCAN-O33-13C-GAL4 (galactose- ¹³ C ₆ , 99%)		12	2214.93	✓	✓		✓	✓	
CLM-10162-CA GLYCAN-N4-13C-GAL8,8' ([galactose- ¹³ C ₆ , 99%] ₂)		13	2383.95			✓		✓	
CLM-10141-CA GLYCAN-N58-13C-GAL6,6' ([galactose- ¹³ C ₆ , 99%] ₂)		14	2530.09	✓		✓		✓	
CLM-10152-CA GLYCAN-N35-13C-GAL6,6',6'' ([galactose- ¹³ C ₆ , 99%] ₃)		14	2634.10			✓		✓	
CLM-10136-CA GLYCAN-N69-13C-GAL6,6',6'' ([galactose- ¹³ C ₆ , 99%] ₃)		15	2780.24	✓		✓		✓	
CLM-10161-CA GLYCAN-N5-13C-GAL8,8' ([galactose- ¹³ C ₆ , 99%] ₂)		15	2790.34			✓		✓	
CLM-10159-CA GLYCAN-N7-13C-GAL8,8' ([galactose- ¹³ C ₆ , 99%] ₂)		15	2966.46		✓	✓		✓	
CLM-10157-CA GLYCAN-N11-13C-GAL8,8' ([galactose- ¹³ C ₆ , 99%] ₂)		17	2968.52	✓		✓		✓	
CLM-10140-CA GLYCAN-N59-13C-GAL6,6' ([galactose- ¹³ C ₆ , 99%] ₂)		16	3112.60	✓	✓	✓		✓	

* Galactose (¹³C₆) Galactose N-Acetylgalactosamine Glucose N-Acetylglucosamine Mannose N-Acetylneuraminic acid Fucose

Labeled

Available in 500 pmol units

Catalog No. / Description	Structure	Residues	MW (Da)	Fucosylated	Sialylated	N-Linked	O-Linked	Branched	Linear
CLM-10160-CA GLYCAN-N6-13C-GAL8,8' ([galactose- ¹³ C ₆ , 99%] ₂)		17	3114.62			✓		✓	
CLM-10139-CA GLYCAN-N63-13C-GAL6,6' ([galactose- ¹³ C ₆ , 99%] ₂)		18	3114.66	✓		✓		✓	
CLM-10151-CA GLYCAN-N36-13C-GAL6,6',6'' ([galactose- ¹³ C ₆ , 99%] ₃)		17	3120.52			✓		✓	
CLM-10135-CA GLYCAN-N70-13C-GAL6,6',6'' ([galactose- ¹³ C ₆ , 99%] ₃)		18	3266.66	✓		✓		✓	
CLM-10158-CA GLYCAN-N9-13C-GAL8,8' ([galactose- ¹³ C ₆ , 99%] ₂)		19	3697.13		✓	✓		✓	
CLM-10148-CA GLYCAN-N45-13C-GAL6,6',6'' ([galactose- ¹³ C ₆ , 99%] ₃)		20	3730.10			✓		✓	
CLM-10156-CA GLYCAN-N15-13C-GAL8,8' ([galactose- ¹³ C ₆ , 99%] ₂)		23	3991.47	✓		✓		✓	
CLM-10150-CA GLYCAN-N37-13C-GAL6,6',6'' ([galactose- ¹³ C ₆ , 99%] ₃)		20	3994.28		✓	✓		✓	
CLM-10149-CA GLYCAN-N39-13C-GAL6,6',6'' ([galactose- ¹³ C ₆ , 99%] ₃)		23	3997.37	✓		✓		✓	

* Galactose (¹³C₆)
 ● Galactose
 ■ N-Acetylglucosamine
 ● Glucose
 ■ N-Acetylglucosamine
 ● Mannose
 ◆ N-Acetylneuraminic acid
 ▲ Fucose

Catalog No. / Description	Structure	Residues	MW (Da)	Fucosylated	Sialylated	N-Linked	O-Linked	Branched	Linear
CLM-10134-CA GLYCAN-N71-13C-GAL6,6',6'' ([galactose- ¹³ C ₆ , 99%] ₃)		21	4140.42	✓	✓	✓		✓	
CLM-10133-CA GLYCAN-N73-13C-GAL6,6',6'' ([galactose- ¹³ C ₆ , 99%] ₃)		24	4143.51	✓		✓		✓	
CLM-10147-CA GLYCAN-N46-13C-GAL6,6',6'' ([galactose- ¹³ C ₆ , 99%] ₃)		23	4216.52			✓		✓	
CLM-10155-CA GLYCAN-N16-13C-GAL8,8' ([galactose- ¹³ C ₆ , 99%] ₂)		25	4573.98	✓	✓	✓		✓	
CLM-10146-CA GLYCAN-N48-13C-GAL6,6',6'' ([galactose- ¹³ C ₆ , 99%] ₃)		26	5090.28		✓	✓		✓	
CLM-10145-CA GLYCAN-N52-13C-GAL6,6',6'' ([galactose- ¹³ C ₆ , 99%] ₃)		32	5531.79	✓		✓		✓	

Unlabeled

Available in 500 pmol units

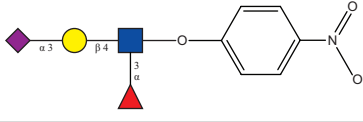
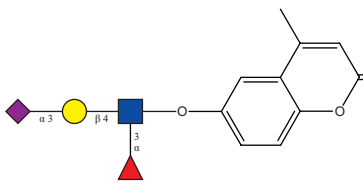
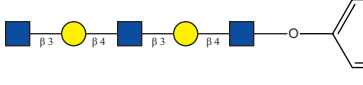
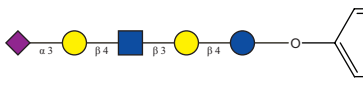
Catalog No. / Description	Structure	Residues	MW (Da)	Fucosylated	Sialylated	N-Linked	O-Linked	Branched	Linear
ULM-10058-CA GLYCAN-F78 (unlabeled)		2	383.35						✓
ULM-10072-CA GLYCAN-F64 (unlabeled)		3	488.44	✓					✓
ULM-10075-CA GLYCAN-F61 (unlabeled)		3	488.44	✓					✓
ULM-10093-CA GLYCAN-F41 (unlabeled)		2	504.44						✓
ULM-10053-CA GLYCAN-F83 (unlabeled)		3	504.44						✓
ULM-10103-CA GLYCAN-F28 (unlabeled)		3	529.49	✓					✓
ULM-10073-CA GLYCAN-F63 (unlabeled)		3	529.49	✓					✓
ULM-10097-CA GLYCAN-F37 (unlabeled)		3	545.49						✓
ULM-10168-CA GLYCAN-O1 (unlabeled)		3	586.54				✓		✓
ULM-10047-CA GLYCAN-GNLACNAC (unlabeled)		3	586.54						✓
ULM-10100-CA GLYCAN-F34 (unlabeled)		3	609.53	✓					✓
ULM-10070-CA GLYCAN-F66 (unlabeled)		3	609.53	✓					✓
ULM-10071-CA GLYCAN-F65 (unlabeled)		3	609.53	✓					✓
ULM-10068-CA GLYCAN-F68 (unlabeled)		3	646.59	✓					✓

* Galactose (¹³C₆)
 ● Galactose
 ■ N-Acetylgalactosamine
 ● Glucose
 ■ N-Acetylglucosamine
 ● Mannose
 ◆ N-Acetylneuraminic acid
 ▲ Fucose

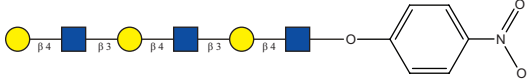
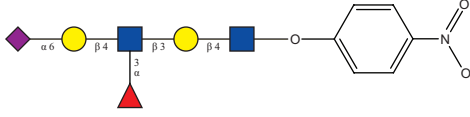
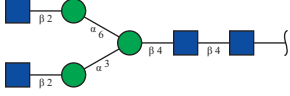
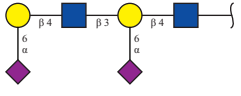
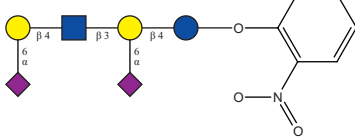
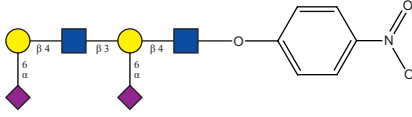
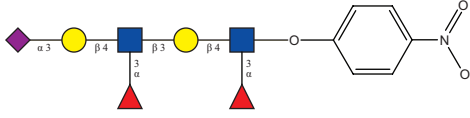
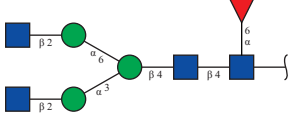
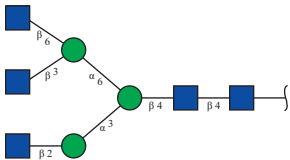
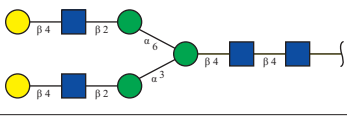
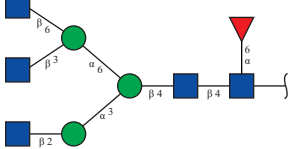
Catalog No. / Description	Structure	Residues	MW (Da)	Fucosylated	Sialylated	N-Linked	O-Linked	Branched	Linear
ULM-10095-CA GLYCAN-F39 (unlabeled)		3	666.58						✓
ULM-10102-CA GLYCAN-F30 (unlabeled)		3	674.60		✓				✓
ULM-10101-CA GLYCAN-F31 (unlabeled)		3	674.60		✓				✓
ULM-10055-CA GLYCAN-F81 (unlabeled)		4	675.63	✓				✓	
ULM-10090-CA GLYCAN-F44 (unlabeled)		4	707.63						✓
ULM-10054-CA GLYCAN-F82 (unlabeled)		4	732.68	✓				✓	
ULM-10165-CA GLYCAN-FX2 (unlabeled)		4	748.68						✓
ULM-10079-CA GLYCAN-F57 (unlabeled)		3	754.65		✓				✓
ULM-10078-CA GLYCAN-F58 (unlabeled)		3	754.65		✓				✓
ULM-10089-CA GLYCAN-F45 (unlabeled)		3	795.70		✓				✓
ULM-10056-CA GLYCAN-F80 (unlabeled)		4	828.72						✓
ULM-10086-CA GLYCAN-F48 (unlabeled)		4	828.72						✓
ULM-10099-CA GLYCAN-F35 (unlabeled)		3	832.76		✓				✓
ULM-10076-CA GLYCAN-F60 (unlabeled)		4	869.78						✓

Unlabeled

Available in 500 pmol units

Catalog No. / Description	Structure	Residues	MW (Da)	Fucosylated	Sialylated	N-Linked	O-Linked	Branched	Linear
ULM-10085-CA GLYCAN-F49 (unlabeled)		4	941.84	✓	✓				✓
ULM-10083-CA GLYCAN-F51 (unlabeled)		5	974.87	✓				✓	
ULM-10052-CA GLYCAN-F84 (unlabeled)		5	974.87	✓					✓
ULM-10084-CA GLYCAN-F50 (unlabeled)		4	978.90	✓	✓				✓
ULM-10074-CA GLYCAN-F62 (unlabeled)		5	1015.92	✓					✓
ULM-10077-CA GLYCAN-F59 (unlabeled)		5	1031.92						✓
ULM-10166-CA GLYCAN-F2 (unlabeled)		5	1039.94		✓				✓
ULM-10069-CA GLYCAN-F67 (unlabeled)		5	1072.97						✓
ULM-10081-CA GLYCAN-F53 (unlabeled)		5	1119.98		✓				✓
ULM-10067-CA GLYCAN-F69 (unlabeled)		5	1161.03		✓				✓
ULM-10066-CA GLYCAN-F70 (unlabeled)		5	1161.03		✓				✓
ULM-10065-CA GLYCAN-F71 (unlabeled)		6	1162.06	✓				✓	

● Galactose (¹³C₆)
 ● Galactose
 ■ N-Acetylgalactosamine
 ● Glucose
 ■ N-Acetylglucosamine
 ● Mannose
 ◆ N-Acetylneuraminic acid
 ▲ Fucose

Catalog No. / Description	Structure	Residues	MW (Da)	Fucosylated	Sialylated	N-Linked	O-Linked	Branched	Linear
ULM-10060-CA GLYCAN-F76 (unlabeled)		6	1235.11						✓
ULM-10061-CA GLYCAN-F75 (unlabeled)		6	1307.17	✓	✓			✓	
ULM-10173-CA GLYCAN-N1 (unlabeled)		7	1317.21			✓		✓	
ULM-10082-CA GLYCAN-F52 (unlabeled)		6	1330.19		✓			✓	
ULM-10167-CA GLYCAN-F6 (unlabeled)		7	1332.22	✓	✓			✓	
ULM-10080-CA GLYCAN-F54 (unlabeled)		6	1411.23		✓			✓	
ULM-10064-CA GLYCAN-F72 (unlabeled)		6	1452.29		✓			✓	
ULM-10062-CA GLYCAN-F74 (unlabeled)		7	1453.31	✓	✓			✓	
ULM-10144-CA GLYCAN-N55 (unlabeled)		8	1463.35	✓		✓		✓	
ULM-10154-CA GLYCAN-N33 (unlabeled)		8	1520.40			✓		✓	
ULM-10174-CA GLYCAN-N2 (unlabeled)		9	1641.49			✓		✓	
ULM-10138-CA GLYCAN-N67 (unlabeled)		9	1666.54	✓		✓		✓	
ULM-10175-CA GLYCAN-N3 (unlabeled)		11	2047.87			✓		✓	

* Galactose ($^{13}\text{C}_6$) Galactose N-Acetylgalactosamine Glucose N-Acetylglucosamine Mannose N-Acetylneuraminic acid Fucose

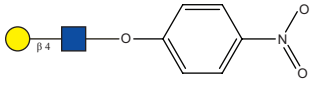
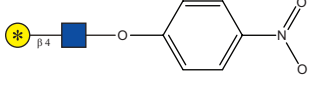
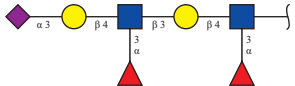
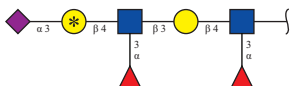
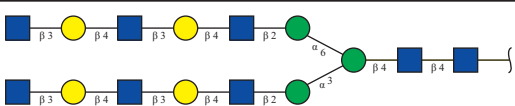
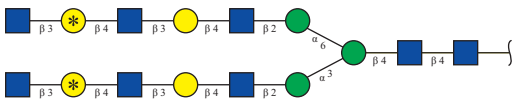




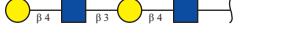

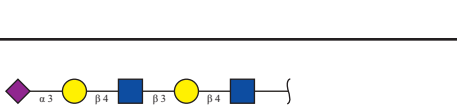
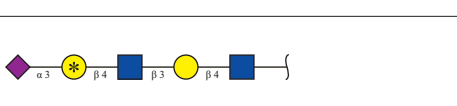
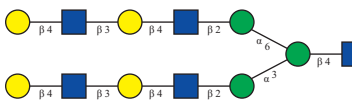
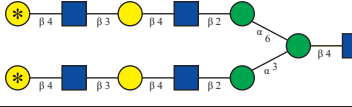
Unlabeled

Available in 500 pmol units

Catalog No. / Description	Structure	Residues	MW (Da)	Fucosylated	Sialylated	N-Linked	O-Linked	Branched	Linear
ULM-10176-CA GLYCAN-N4 (unlabeled)		13	2372.15			✓		✓	
ULM-10177-CA GLYCAN-N5 (unlabeled)		15	2778.54			✓		✓	
ULM-10178-CA GLYCAN-N7 (unlabeled)		15	2954.66		✓	✓		✓	
ULM-10179-CA GLYCAN-N11 (unlabeled)		17	2956.72	✓		✓		✓	
ULM-10180-CA GLYCAN-N12 (unlabeled)		19	3539.23	✓	✓	✓		✓	

Labeled and Unlabeled Pairs

Available in 500 pmol units

	Catalog No. / Description	Structure	Residues	MW (Da)	Fucosylated	Sialylated	N-Linked	O-Linked	Branched	Linear
Pair One – 4-NITROPHENYL 4-D-LACINAC	ULM-10093-CA GLYCAN-F41 (unlabeled)		2	504.44						✓
	CLM-10087-CA GLYCAN-F47 (galactose- ¹³ C ₆ , 99%)		2	510.34						✓
Pair Two – 3'-S-LDXLX	ULM-10167-CA GLYCAN-F6 (unlabeled)		7	1332.22	✓	✓			✓	
	CLM-10106-CA GLYCAN-F6-13C-GAL4 (galactose- ¹³ C ₆ , 99%)		7	1338.12	✓	✓			✓	
Pair Three – GNLN	ULM-10177-CA GLYCAN-N5 (unlabeled)		15	2778.54			✓		✓	
	CLM-10161-CA GLYCAN-N5-13C-GAL8,8' (galactose- ¹³ C ₆ , 99%] ₂)		15	2790.34			✓		✓	
Pair Four – GNLACNAC	ULM-10047-CA GLYCAN-GNLACNAC (unlabeled)		3	586.54						✓
	CLM-10059-CA GLYCAN-F77 (galactose- ¹³ C ₆ , 99%)		3	592.44						✓
Pair Five – DNLN	ULM-10165-CA GLYCAN-FX2 (unlabeled)		4	748.68						✓
	CLM-10051-CA GLYCAN-FX2-13C-GAL4 (galactose- ¹³ C ₆ , 99%)		4	754.58						✓
Pair Six – 3'S-DILN	ULM-10166-CA GLYCAN-F2 (unlabeled)		5	1039.94		✓				✓
	CLM-10046-CA GLYCAN-F2-13C-GAL4 (galactose- ¹³ C ₆ , 99%)		5	1045.84		✓				✓
Pair Seven – DILN	ULM-10176-CA GLYCAN-N4 (unlabeled)		13	2372.15			✓		✓	
	CLM-10162-CA GLYCAN-N4-13C-GAL8,8' (galactose- ¹³ C ₆ , 99%] ₂)		13	2383.95			✓		✓	
Pair Eight – LN	ULM-10174-CA GLYCAN-N2 (unlabeled)		9	1641.49			✓		✓	
	CLM-10132-CA GLYCAN-N2-13C-GAL6,6' (galactose- ¹³ C ₆ , 99%] ₂)		9	1653.29			✓		✓	

* Galactose (¹³C₆)
 ● Galactose
 ■ N-Acetylgalactosamine
 ● Glucose
 ■ N-Acetylglucosamine
 ● Mannose
 ◆ N-Acetylneuraminic acid
 ▲ Fucose

Labeled and Unlabeled Pairs

Available in 500 pmol units

Catalog No. / Description	Structure	Residues	MW (Da)	Fucosylated	Sialylated	N-Linked	O-Linked	Branched	Linear
ULM-10179-CA GLYCAN-N11 (unlabeled)		17	2956.72	✓		✓		✓	
	CLM-10157-CA GLYCAN-N11-13C-GAL8,8' ([galactose- ¹³ C ₆ , 99%] ₂)		17	2968.52	✓		✓		✓
ULM-10178-CA GLYCAN-N7 (unlabeled)		15	2954.66		✓	✓		✓	
	CLM-10159-CA GLYCAN-N7-13C-GAL8,8' ([galactose- ¹³ C ₆ , 99%] ₂)		15	2966.46		✓	✓		✓
ULM-10175-CA GLYCAN-N3 (unlabeled)		11	2047.87			✓		✓	
	CLM-10163-CA GLYCAN-N3-13C-GAL6,6' ([galactose- ¹³ C ₆ , 99%] ₂)		11	2059.67			✓		✓

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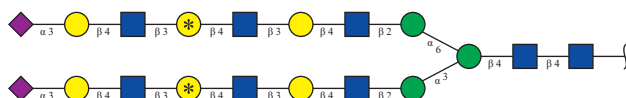


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Certificate of Analysis



Catalog: CLM-10158-CA
Lot: BT 1-129-1-P
Synonym: 3'S triLN
Isotope: ([Galactose-¹³C₆, 99%]₂)
Form: Lyophilized Solid
Formula: C₁₂₈¹³C₁₂H₂₃₀N₁₀O₁₀₂
Mass: 3697.13
Unit: 500 pmol (~ 1.9 μg)
Storage: ≤ -20 °C, Stable ≥ 5 Years

Certification

Cassia, LLC, guarantees that this material meets or exceeds the specifications stated. Absolute identity, as well as chemical and isotopic impurities, are assured by the use of unambiguous synthetic routes and multiple chemical analyses whenever possible.

Quality Control Test	Specification	Result
Appearance of Solid	White Powder	Conforms
HPLC for Chemical Purity	≥ 98%	Conforms
¹ H-NMR for Identification and Chemical Purity	–	Conforms
ESI-MS for Identification (Mono-Isotopic)	3694.34 [C ₁₂₈ ¹³ C ₁₂ H ₂₃₀ N ₁₀ O ₁₀₂ - H]	3694.26 [C ₁₂₈ ¹³ C ₁₂ H ₂₃₀ N ₁₀ O ₁₀₂ - H]

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A microscopic view of several spherical cells with a textured, porous surface, set against a teal background with a bokeh effect of light spots.

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