


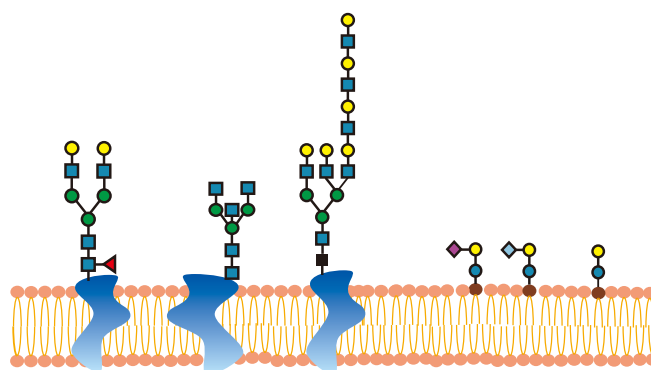


Tumor-associated Antigens

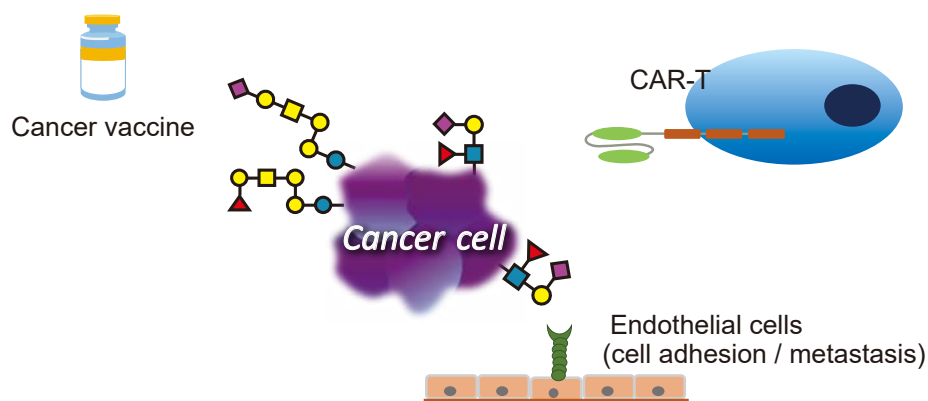
Carbohydrates play important roles in various biological functions such as cell recognition, cell adhesion, intercellular and intracellular signaling, and embryonic development. Cellular glycosylation profiles significantly change during carcinogenesis. These cellular carbohydrate structures are known as tumor-associated carbohydrate antigens, and they are considered promising targets for immunotherapy as well as developing vaccines and therapeutic antibodies. TCI supports the research in this field with various tools.

Glycan (Antigen) Name	Product Code			Tumor Tissues	Ref.
	Glycan 	Conjugate 	Antibody 		
Sialyl Lewis X/ CD15s	S0849 S0922 S0923	H1730	A2849	Blood, Breast, Pancreas, Ovarian, Lung, Biliary tract, Gallbladder	1,2,3
Lewis X/CD15	S0946	H1719	A2578	Blood, Colon	4,5
Sialyl Lewis A	AUR	AUR	A2584 A2509	Colon, Pancreas, Biliary tract, Gallbladder	1
Lewis Y/ CD174	AUR	AUR	A2510	Blood, Breast, Kidney, Ovary, Pancreas, Prostate	2,3
GD2			A3338	Lung, Neurogenic, Melanoma	12, 13, 14
GD3/CD60a			A2580	Kidney, Neurogenic, Melanoma	2,3,6,7
GM2	N0971	AUR	A2576	Blood, Breast, Gastrointestinal, Kidney, Lung, Neurogenic, Ovary, Pancreas, Prostate, Melanoma	2,7,8
GM3	G0422 G0419 S0489 S0885	AUR	A2582	Blood, Kidney, Neurogenic	3,6
Forsman Antigen	F0584	AUR		Breast, Kidney	7
Gb3/CD77	G0402 G0403 M1767	H1718	A2506	Blood, Colon, Pancreas	9,10
SSEA-3	G0355 G0434	AUR		Blood, Gastrointestinal, Kidney, Lung, Ovary	11
Globo H	G0447	AUR		Blood, Breast, Kidney, Ovary, Pancreas, Prostate	2,6



The structural changes in the glycomoiety of proteins and lipids in cancerous cells.

The glycomoiety structure of proteins and lipids changes in cancerous cells. For example, *N*-acetylglucosaminyltransferase V (GnT-V) is expressed at a very low level in normal cells, but is abundant in cancer cells. Due to such changes in the expression levels of glycosyltransferases, the synthesized oligosaccharide chains vary based on the type of cancer cells, and can be used as diagnostic markers.



Targeting tumor-associated carbohydrate antigen

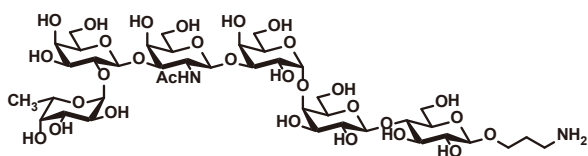
Cancer cell-specific oligosaccharides play important roles, such as immortalization of cancer cell, cell adhesion / metastases, and abnormal growth. Such cancer cell-specific oligosaccharides are good targets for drug discovery, and these oligosaccharides are being used to develop therapeutic targets, vaccine preparations (using cancer antigens), inhibitors of carbohydrate synthesis, galectins, and selectins, antibody-based drugs targeting oligosaccharide antigens, and chimeric antigen receptor gene modified T cells (CAR-T).

References

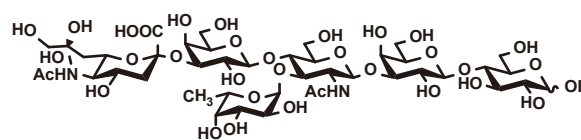
- 1) Glycobiomarker, Fucosylated Short-Form Secretogranin III Levels Are Increased in Serum of Patients with Small Cell Lung Carcinoma ; A. Togayachi, J. Iwaki, H. Kaji, H. Matsuzaki, A. Kuno, Y. Hirao, M. Nomura, M. Noguchi, Y. Ikehara, H. Narimatsu, *J. Proteome Res.* **2017**, *16*, 4495.
- 2) Glycans in cancer and inflammation — potential for therapeutics and diagnostics ; D. H. Dube, C. R. Bertozzi, *Nat. Rev. Drug Discov.* **2005**, *4*, 447.
- 3) Tumour-associated carbohydrate antigens in breast cancer ; A. Cazet, S. Julien, M. Bobowski, J. Burchell, P. Delannoy, *Breast Cancer Res.* **2010**, *12*, 204.
- 4) Expression of Lewis(a), sialyl Lewis(a), Lewis(x) and sialyl Lewis(x) antigens as prognostic factors in patients with colorectal cancer ; T Nakagoe, K Fukushima, A Nanashima, *et al.*, *Can. J. Gastroenterol* **2000**, *14*, 753.
- 5) *WHO classification of tumours of the haematopoietic and lymphoid tissues*, 4th ed., ed. by S. H. Swerdlow, E. Campo, N. L. Harris, *et al.*, IARC Press, Lyon, **2000**, pp. 157-334.
- 6) The sweet and sour of cancer: glycans as novel therapeutic targets ; M. M. Fuster, J. D. Esko, *Nat. Rev. Cancer.* **2005**, *5*, 526.
- 7) *Structures Common to Different Glycans, in Essentials of Glycobiology*, 2nd ed., ed. by A. Varki, R. D. Cummings, J. D. Esko, *et al.*, Cold Spring Harbor Laboratory Press, New York, **2009**.
- 8) Ganglioside GM2 as a human tumor antigen (OFA-I-1) ; T. Tai, J. C. Paulson, L. D. Cahan, R. F. Irie, *Proc. Natl. Acad. Sci. USA* **1983**, *80*, 5392.
- 9) Molecular cloning of globotriaosylceramide/CD77 synthase, a glycosyltransferase that initiates the synthesis of globo series glycosphingolipids ; Y. Kojima, S. Fukumoto, K. Furukawa, T. Okajima, J. Wiels, K. Yokoyama, Y. Suzuki, T. Urano, M. Ohta, K. Furukawa, *J. Biol. Chem.* **2000**, *275*, 15152.
- 10) Shiga toxin receptor Gb3Cer/CD77: tumor-association and promising therapeutic target in pancreas and colon cancer ; U. Distler, J. Souady, M. Hülsewig, I. Drmic-Hofman, J. Haier, A. W. Friedrich, H. Karch, N. Senninger, K. Dreisewerd, S. Berkenkamp, M. A. Schmidt, J. Peter-Katalinić, J. Müthing, *PLoS ONE* **2009**, *4*, e6813.
- 11) Cancer-associated glycosphingolipid antigens: their structure, organization, and function ; S. Hakomori, *Acta Anat. (Basel)* **1998**, *161*, 79.
- 12) Detection of ganglioside GD2 in tumor tissues and sera of neuroblastoma patients ; G.Schulz, DA. Cheresch, NM. Varki, A. Yu, LK. Staffileno, RA. Reisfeld, *Cancer Res.* **1984**, *12 Pt 1*, 5914.
- 13) Ganglioside G(D2) in small cell lung cancer cell lines: enhancement of cell proliferation and mediation of apoptosis ; S. Yoshida, S. Fukumoto, H. Kawaguchi, S. Sato, R. Ueda, K. Furukawa, *Cancer Res.* **2001**, *61*, 4244.
- 14) Disialoganglioside GD2 as a therapeutic target for human diseases ; M. Suzuki, NK. Cheung, *Expert Opin Ther Targets* **2015**, *19*, 349.

Tumor-associated carbohydrate antigens

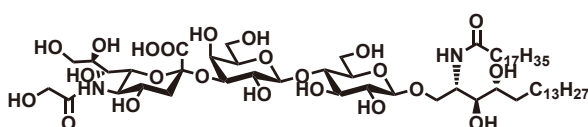
Globo-H-PrNH₂ [G0447]



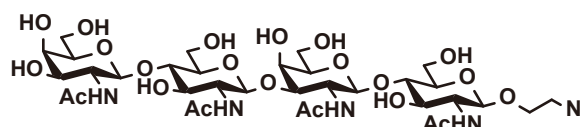
SialylLewis X-Lactose [S0849]



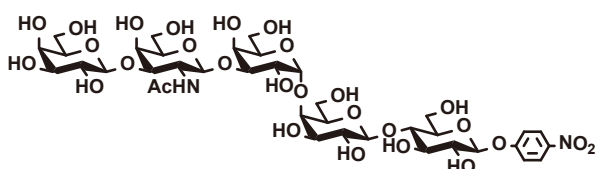
Ganglioside GM3(Neu5Gc) (phyto-type) [G0510]



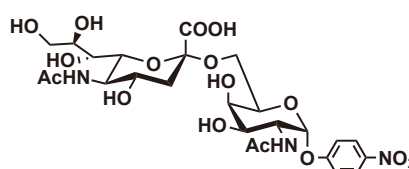
LacDiNAcDimer Ethylazide [L0237]



SSEA-3 [G0355]

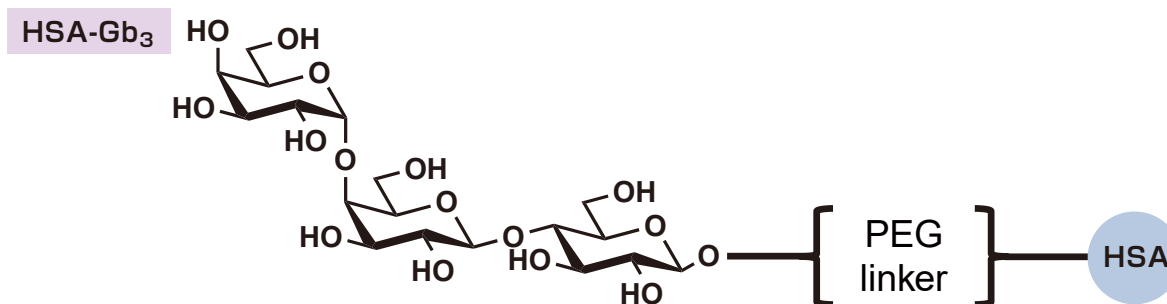


Neu5Acα(2-6)GalNAc-α-pNP [N0890]



HSA-Oligosaccharide Conjugates : useful tools for evaluating carbohydrate-binding molecules

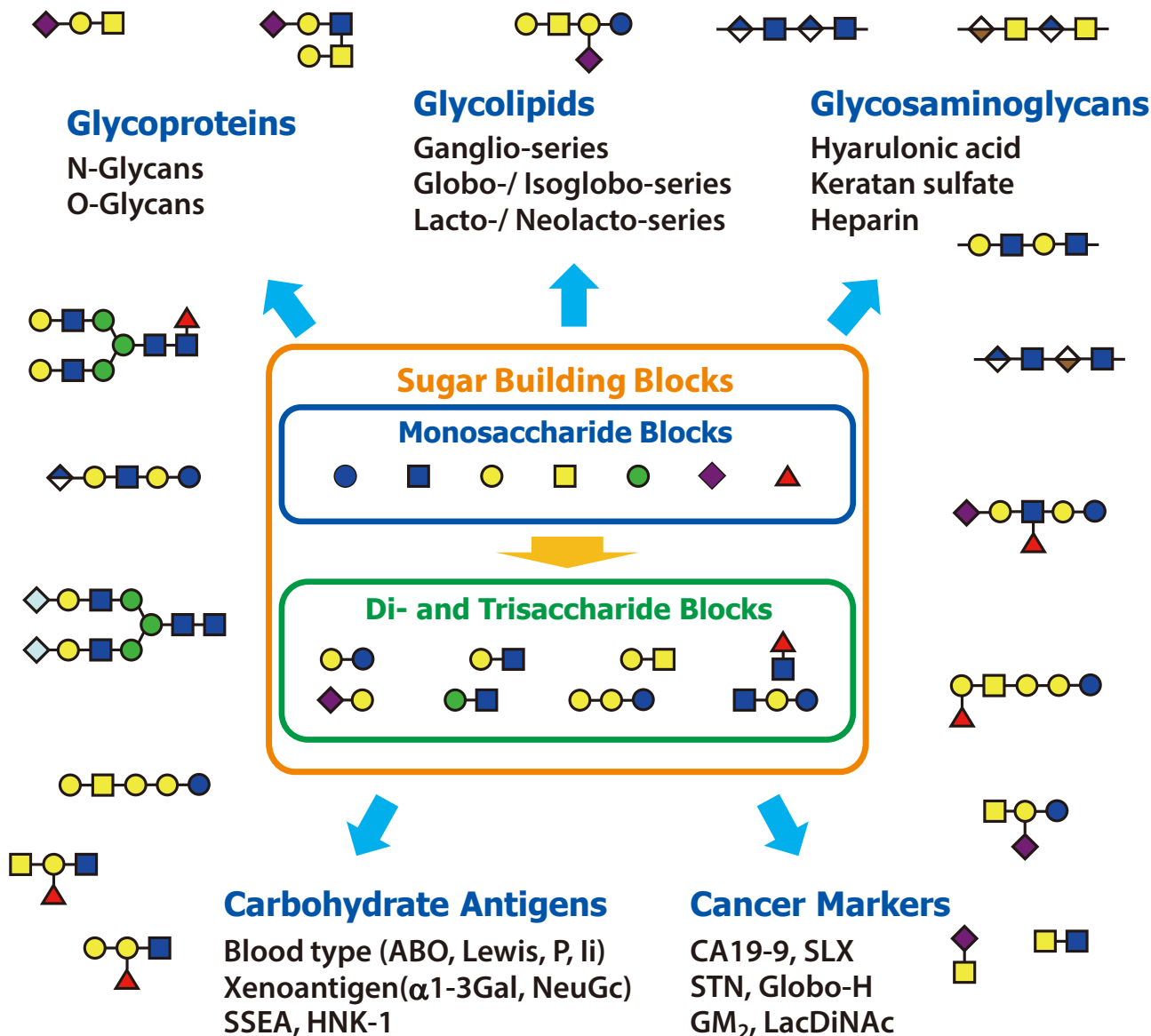
These are useful tools for evaluating carbohydrate-binding molecules, including antibodies. The recombinant HSA produced in plants does not contain animal-derived components and cannot be contaminated with virus. Additionally, it has the same structure, characteristics, and biological activity as natural HSA. Several sugar-conjugates are available, and it is also possible to manufacture the sugar-conjugates according to customer specifications. For more details on the products and contracts, please contact us.



- HSA-Gb₃ [H1718]
- HSA-Lewis X [H1719]
- HSA-Sialyl Lewis X [H1730]

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