SUPPLEMENTAL DATA

Determination of the structure of human CLEC5A by multi-step molecular replacement.

The data were processed using the HKL2000 software package in the P3 space group, a=b= 109.1 Å c=84.9 Å (1). The systematic absences suggested that the true space group was either $P3_1$ or $P3_2$. There was a strong non-origin peak in the Patterson map with a height of 0.23 relative to the height of the origin peak. This peak corresponded to the pseudotranslation (a-b)/3. A "sigmoidal" shape of the cumulative intensity distribution for acentric reflections suggested the possibility of twinning. This criterion of twinning remains valid even in the presence of pseudotranslation (2). The data were further analyzed using *SFCHECK* (3). The data in the resolution range 10 to 3.3 Å had completeness of 99.5 % and R_{merge} less than 0.1 and were therefore used in the partial twinning test (H-test) (4). This test confirmed the presence of partial merohedral twinning with a twinning fraction of approximately 0.2 and with the twin operator -h,h+k,-l. The self-rotation function (SRF) was computed using MOLREP (5). The SRF-peak corresponding to the twin operation (⟍ = 90 °, ⟋ = 90 °, | = 180 °) had a height of 0.84 relative to the height of the crystallographic peak. Such a large correlation between twin-related intensities could not be explained by partial twinning with a twinning fraction of 0.2 and suggested the presence of a non-crystallographic symmetry axis aligned with the twin axis. Altogether, the above considerations suggested that the structure of a twin individual or of its substructure had pseudosymmetry $P3_121$ or $P3_221$ with the translation basis (a-b)/3, (a+2b)/3, c.

Several cases of pseudosymmetry in $P3_1$ and $P3_2$ structures have been reported. For example, Lee et al. described a twinned $P3_2$ structure of superoxide dismutase (PDB:1P7G) with 24 molecules per asymmetric unit which had pseudosymmetry $P3_121$ with the translation basis (a-b)/3, (a+2b)/3, c/2 and in which three equivalent twin axes were parallel to the two- fold axes of the pseudosymmetry space group (2). Another example, the structure of iron-binding protein (PDB code 1O7T) had symmetry $P3_2$ and 9 molecules in the asymmetric unit (6). Only a substructure with 6 out of 9 molecules in the asymmetric unit was pseudosymmetric in this case, the pseudosymmetry being $P3_221$ with basis vectors (a-b)/3, (a+2b)/3 and c. The latter example seemed most relevant to our case, as 9 molecules in the asymmetric unit in our crystal would correspond to a solvent content of 50 %.

The structure of CLEC5A was solved using the following modes of the molecular replacement (MR) program MOLREP: (i) the conventional search with the fast rotation function (RF) and the fast translation function (TF), (ii) the fast RF against modified structure factors followed by the phased translation function (PTF), and (iii) spherically averaged phased translation function (SAPTF) followed by phased rotation function (PRF) and validated using PTF (5-7). Phases in modes (ii) and (iii) were from the partial solution found in the preceding step of MR and refined using REFMAC (10). Modified structure amplitudes in the mode (ii) were from the REFMAC 2Fo-Fc map, in which the modeled part was masked using the partial structure.

A monomer of human CD94 protein (PDB code 3BDW) bearing 26 % identity with the CLEC5A target sequence, was adjusted to fit the target sequence using BALBES, and was subsequently used as the search model for this multi-protocol molecular replacement (8,9). Protocol (i) permitted the assignment of the space group $P3_1$, and the positioning of molecules A to C (molecules are referred to by their chain identifier in the model deposited with the PDB). Molecules D and E were found using protocol (ii). The structure A-D possessed $P3_121$ pseudosymmetry with translation vectors (2a+b)/3, (-a+b)/3 and c.

Refinement of the structure at this stage resulted in an R-factor of 46.4 % and R-free of 49.6 %. Further attempts using protocol (i) failed to find more molecules, suggesting that a careful analysis of pseudosymmetry was required. Supplementary Figure 1 shows that a putative crystal with a small unit cell belonging to the pseudosymmetry space group $P3_121$ possesses three times more three-fold axes than the actual $P3_1$ crystal with a large unit-cell. One third of all three-fold axes of a pseudosymmetry space group are crystallographic axes and the remaining two thirds represent non-crystallographic symmetry axes in a crystallographic space group with the large unit cell. The choice of a different crystallographic axis defines three different non-equivalent subgroups of

the pseudosymmetry space group and, therefore, three different $P3_1$ structures. Because the three structures can only differ by minor perturbations of the higher order symmetry, the TF cannot select the correct structure from the three possibilities. Therefore, all three possible structures were generated and refined using REFMAC to give R_{cryst}/R_{free} of 46.0/49.8 for the original MR solution, as compared with 45.9/49.5 and 43.0/46.6 for the alternative structures. The second of the two alternative structures was chosen and used in further MR trials with protocol (ii) to find molecules G and H. No further molecules were identified by this method, but an inspection of the electron density map after refinement of the substructure A-H revealed clear density allowing the positioning of one last molecule, I, using the method (iii).

CLEC5A BRET experiment fusion protein constructs.

Two plasmids were constructed, one encoding CLEC5A with GFP fused to its N-terminus and one encoding CLEC5A with luciferase fused to its N-terminus. This BRET pair of CLEC5A fusion proteins was used to transfect HEK 293T cells. Following transfection, the natural full-length CLEC5A fusion proteins were detected at the cell surface at a substantially reduced density compared to their unfused counterparts, such that BRET studies were not possible. As the predicted CLEC5A cytoplasmic domain is only 4 amino acids in length, we hypothesized that the very close proximity of the fused domain (GFP or luciferase) to the plasma membrane was detrimental to the stability of the fusion protein. Therefore, an additional BRET pair of constructs was generated (Supplementary Figure 2), in which the natural, short cytoplasmic sequence of CLEC5A (residues 1-4) was replaced with the slightly longer CLEC-2 cytoplasmic domain (residues 1-32). There is no evidence to suggest that the cytoplasmic domain of CLEC-2 contributes to CLEC-2 dimerization and we have shown that the extracellular domain of CLEC-2 dimerizes in the absence of this domain (10). For all experiments documented in the main body of the manuscript, unless otherwise stated, Construct 2 (Supplementary Figure 2) was used, in which the natural, short cytoplasmic sequence of CLEC5A (residues 1-4) was replaced with the CLEC-2 cytoplasmic domain (residues 1-32).

CLEC5A glycan microarray analysis.

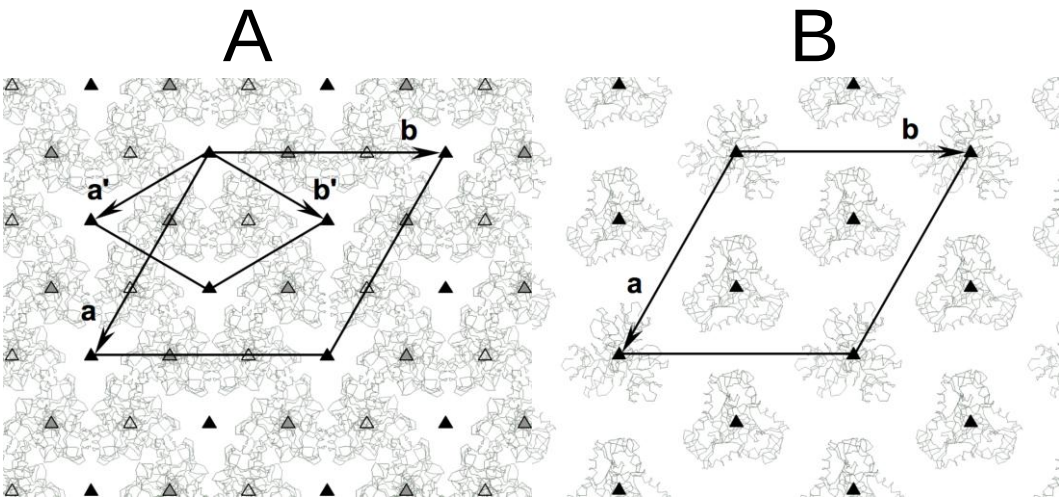
Neoglycolipid-based microarray analyses

Recombinant monomeric CLEC5A protein was biotinylated on an N-terminal tag using the enzyme BirA (11), and oligomerized, by pre-complexing with Alexa Fluor 647-labelled streptavidin. The microarrays contained 452 lipid-linked oligosaccharide probes, neoglycolipids and glycolipids (Supplementary Table 1), printed non-covalently onto nitrocellulose-coated glass slides at 2 and 7 fmol/spot, and microarray analyses were performed as described for Dectin-1 (12). Several conditions for the CLEC5A binding assay were investigated, such as the protein concentration, blocking and diluent solutions. The data presented are representative of results from assay conditions that gave the smoothest background. In brief, the arrayed slides were blocked with 1 % casein (Pierce, Thermo Scientific, Rockford, Il) in 10 mM Tris-HCl buffer, pH 7.4, containing 5 mM $CaCl_2$ and 150 mM NaCl and overlaid for 2 h with labelled CLEC5A (10 μg/mL in blocker solution) at ambient temperature. Data analysis and presentation was performed with dedicated software developed by Mark S. Stoll of the Glycosciences Laboratory (13). Results at 7 fmol/spot are illustrated. None of the probes in the array gave binding signals with CLEC5A (Figure 4B).

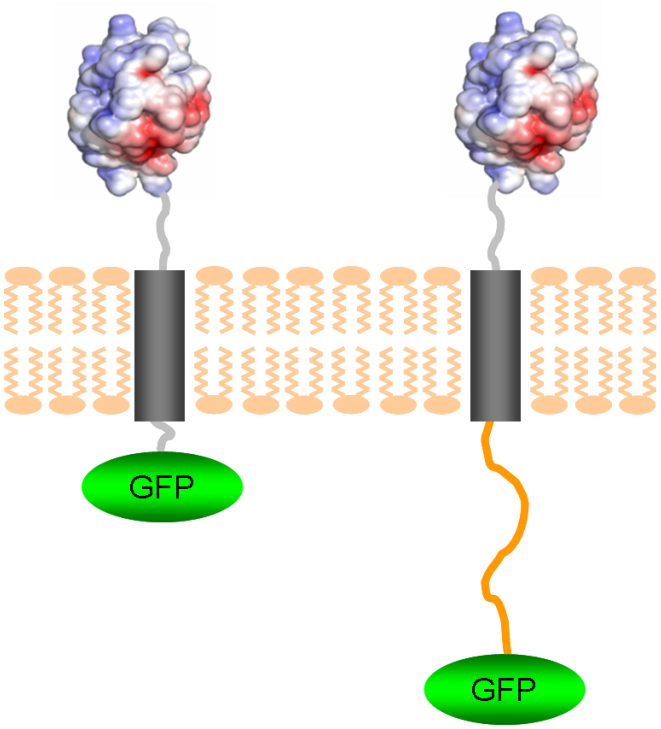
CFG Glycan microarray analysis

Recombinant CLEC5A (amino acids 71-187) tagged on its N-terminus with a BirA recognition sequence was biotinylated, and oligomerized by pre-complexing with neutravidin-FITC to test binding to a panel of 406 natural and synthetic oligosaccharide probes printed covalently onto N-hydroxysuccinimide-activated glass slides (printed array version 3.2) assembled by the Consortium for Functional Glycomics (CFG) core H microarrays (US) Labelled CLEC5A was diluted to 200 μg/mL in 20 mM Tris-HCl, pH 7.4, 150 mM NaCl, 2 mM $CaCl_2$, 2 mM $MgCl_2$, 0.05 % Tween 20, 1 % BSA, and

70 µL of this solution was applied to the printed surface and coverslipped. The slide was incubated in a humidified chamber at room temperature for 1 hour. This slide was washed for 10 seconds each in 20 mM Tris-HCl, pH 7.4, 150 mM NaCl 2 mM $CaCl_2$, 2 mM $MgCl_2$, 0.05 % Tween 20, then 20 mM Tris-HCl, pH 7.4, 150 mM NaCl 2 mM CaCl2, 2 mM MgCl2, and then in deionized water and was subsequently dried under a stream of nitrogen. The binding image was read in a Perkin Elmer Microscanarray XL4000 scanner and results were uploaded to the Consortium database http://www.functionalglycomics.org). The glycan–related probes and their spacers are given in Supplementary Table 2. No specific binding signals were observed with CLEC5A (Figure 4C).



Supplementary Figure 1. Organisation of the CLEC5A protein crystal.
Cα traces in the background show the substructures generated by crystallographic symmetry from molecules (A) A to F and (B) H to I. Crystallographic 3_1 axes are shown by black triangles and pseudosymmetry 3_1 axes are shown by grey and open triangles. Crystallographic translations a and b and pseudotranslations a' = (a-b)/3 and b' = (a+2b)/3 are shown by arrows. The whole structure belongs to the space group $P3_1$. The substructure in (A) has pseudosymmetry $P3_121$ with translation basis a', b'. In the false MR solution for the molecules A to F the origin was located on one of the non-crystallographic symmetry axes shown by open triangles and, accordingly, all these axes were treated as crystallographic in the subsequent molecular replacement search for molecules G to I. The substructure G to I (B) is not symmetric relative to the rotations about these axes and therefore it could not be solved until the position of origin in the substructure (A) was corrected.



		Construct 1			Construct 2		
		EC	TM	IC	EC	TM	IC
		CLEC5A	CLEC5A	CLEC5A	CLEC5A	CLEC5A	CLEC-2
BRETmax	+ DAP12	0			0.204		
	- DAP12	0			0.208		

Supplementary Figure 2. CLEC5A BRET constructs.
CLEC5A fusion constructs used for BRET. CLEC5A segments are colored grey, CLEC-2 segments are colored yellow. The GFP portion of the fusion protein is shown in green. Equivalent constructs were used for the luciferase fusion proteins in each BRET pair. The table indicates the BRETmax for the BRET pairs of each of these constructs, where the experiments were performed in the absence and presence of DAP12. EC: extracellular, TM: transmembrane, IC: intracellular.

Pos[a]	Probe[b]	Sequence	Fluorescence
	Lactose and N-acetyllactosamine-based		
1	Galactocerebrosides	Galß-Cer	-
2	H-Di	Fucα-2Gal	-
3	A-Tri	GalNAcα-3Gal | Fucα-2	-
4	B-Tri	Galα-3Gal | Fucα-2	-
5	GSC-426	3-deoxy,3-carboxymethyl-Galß-C30	-
6	Sulfatide	SU-3Galß-Cer	-
7	GSF-1	SU-3Galß-C30	5
8	GSC-209	GlcAß-3Galß-Cer42	-
9	GSC-210	SU-3GlcAß-3Galß-Cer42	-
10	GSC-187	NeuAcα-3Galß-C29	-
11	GSC-40	NeuAcα-(S)-3Galß-Cer42	-
12	GSC-230	NeuAcα-8NeuAcα-3Galß-Cer36	-
13	GSC-27	NeuAcα-6Galß-Cer36	-
14	GSC-144	KDNα-6Galß-Cer36	-
15	GSC-13	NeuAcα-(S)-6Galß-Cer36	-
16	GSC-72	NeuAcα-(S)-6Galβ-(S)-Cer36	-
17	GSC-231	NeuAcα-8NeuAcα-6Galß-Cer36	8
18	GSC-439	NeuAcα-8NeuAcα-8NeuAcα-6Galß-Cer36	2
19	Glucocerebrosides	Glcß-Cer?	7
20	GSF-19	SU-6Glcβ-C30	-
21	GSC-60	NeuAcα-6Glcß-Cer36	-
22	GSC-9	NeuAcα-(S)-6Glcß-Cer36	-
23	GSC-62	NeuAcα-2Glcß-Cer36	-
24	GSC-59	NeuAcα-6GlcNAcß-Cer36	-
25	GSC-95	NeuAcα-(S)-6GlcNAcß-Cer36	-
26	GSC-232	NeuAcα-8NeuAcα-6Glcß-Cer36	-
27	Lactocerebrosides	Galß-4Glcß-Cer	-
28	Lac	Galß-4Glc	-
29	Lac-AO	Galß-4Glc-AO	-

30	GSC-432	3-deoxy,3-carboxymethyl-Galß-4Glcß-C30	-
31	GSC-296	GlcAß-3Galß-4Glcß-C30	-
32	GSC-353	SU-3GlcAß-3Galβ-4Glcß-C30	-
33	GalNAcα-3Galß-4Glc	GalNAcα-3Galß-4Glc	-
34	Ceramide trihexoside	Galα-4Galß-4Glcß-Cer	-
35	Globoside (P-antigen)	GalNAcß-3Galα-4Galß-4Glcß-Cer	-
36	Forssmann glycolipid	GalNAcα-3GalNAcß-3Galα-4Galß-4Glcß-Cer	-
37	GSC-430	3-deoxy,3-carboxymethyl-Galß-3Glcß-C30 | Fucα-4	-
38	GSC-260	3-deoxy,3-carboxymethyl-Galß-4Glcß-C30 | Fucα-3	-
39	GSC-150	SU-3Galß-4Glcß-C30 | Fucα-3	-
40	NeuAcα-(3')Lac	NeuAcα-3Galß-4Glc	-
41	NeuAcα-(3')Lac-AO	NeuAcα-3Galß-4Glc-AO	-
42	Neu4,5Ac-(3')Lac	Neu4,5Acα-3Galß-4Glc	-
43	Neu4,5Ac-(3')Lac-AO	Neu4,5Acα-3Galß-4Glc-AO	-
44	GSC-16	NeuAcα-3Galß-4Glcß-Cer32	-
45	GSC-178	NeuAcα-3Galß-4Glcß-Cer34	-
46	GSC-17	NeuAcα-3Galß-4Glcß-Cer36	-
47	GSC-18	NeuAcα-3Galß-4Glcß-Cer42	-
48	GSC-197	KDNα-3Galβ-4Glcß-Cer28	4
49	GSC-199	KDNα-3Galβ-4Glcß-C30	-
50	GSC-198	KDNα-3Galβ-4Glcß-Cer34	-
51	GSC-75	(4-deoxy)NeuAcα-3Galß-4Glcß-Cer36	-
52	GSC-76	(7-deoxy)NeuAcα-3Galß-4Glcß-Cer36	20
53	GSC-77	(8-deoxy)NeuAcα-3Galß-4Glcß-Cer36	-
54	GSC-153	(4,8-deoxy)NeuAcα-3Galß-4Glcß-Cer36	-
55	GSC-51	(9-deoxy)NeuAcα-3Galß-4Glcß-Cer36	-
56	GSC-78	(4-OMe)NeuAcα-3Galß-4Glcß-Cer36	-
57	GSC-79	(9-OMe)NeuAcα-3Galß-4Glcß-Cer36	-
58	GSC-23	(C7)NeuAcα-3Galß1-4Glcß-Cer36	-
59	GSC-24	(C8)NeuAcα-3Galß1-4Glcß-Cer36	-
60	GSC-50	(C8 diastereoisomer)NeuAcα-3Galß-4Glcß-Cer36	-
61	GSC-229	NeuAcα-8NeuAcα-3Galß-4Glcß-Cer36	-
62	GSC-96	NeuAcα-9NeuAcα-3Galβ-4Glcß-Cer36	-
63	GSC-437	NeuAcα-8NeuAcα-8NeuAcα-3Galβ-4Glcß-Cer36	-

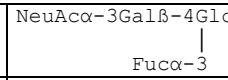
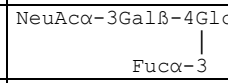
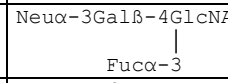
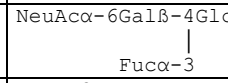
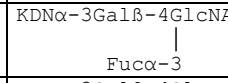
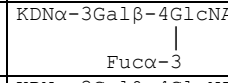
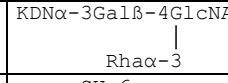
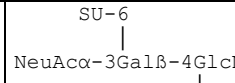
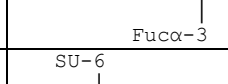
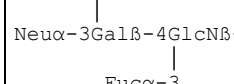
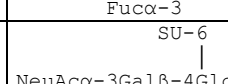
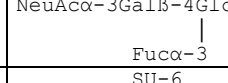
64	Neuα-(3')Lac	Neuα-3Galß-4Glc	8
65	Neuα-(3')Lac-AO	Neuα-3Galß-4Glc-AO	1
66	NeuAcα-(6')Lac	NeuAcα-6Galß-4Glc	-
67	NeuAcα-(6')Lac-AO	NeuAcα-6Galß-4Glc-AO	2
68	GSC-61	NeuAcα-6Galß-4Glcß-Cer36	-
69	GSC-12	NeuAcα-(S)-6Galß-4Glcß-Cer36	-
70	GSC-234	NeuAcα-(S)-6Gal(S)β-4Glcß-Cer36	3
71	GSC-73	NeuAcα-(S)-6Galβ-4Glcβ-(S)-Cer36	-
72	Neuα-(6')Lac	Neuα-6Galß-4Glc	8
73	Neuα-(6')Lac-AO	Neuα-6Galß-4Glc-AO	-
74	NeuAcß-(3')Lac	NeuAcß-3Galß-4Glc	-
75	NeuAcß-(3')Lac-AO	NeuAcß-3Galß-4Glc-AO	-
76	NeuAcß-(6')Lac	NeuAcß-6Galß-4Glc	-
77	NeuAcß-(6')Lac-AO	NeuAcß-6Galß-4Glc-AO	-
78	GSC-161	NeuAcα-3Galß-4Glcß-C30 | Fucα-3	11
79	GSC-162	NeuAcα-3Galß-4Glcß-Cer36 | Fucα-3	-
80	LacNAc(1-3)	Galß-3GlcNAc	-
81	LacNAc(1-3)-AO	Galß-3GlcNAc-AO	3
82	LacNAc	Galß-4GlcNAc	-
83	LacNAc-AO	Galß-4GlcNAc-AO	-
84	Galα-4Galß-4GlcNAc	Galα-4Galß-4GlcNAc	-
85	SU(3')-LN	SU-3Galß-4GlcNAc	-
86	Lea-Tri	Galß-3GlcNAc | Fucα-4	7
87	Lea-Tri-AO	Galß-3GlcNAc-AO | Fucα-4	-
88	Lex-Tri	Galß-4GlcNAc | Fucα-3	-
89	Lex-Tri-AO	Galß-4GlcNAc-AO | Fucα-3	-
90	Lex-Tri-(Me)AO	Galß-4GlcNAc-(Me)AO | Fucα-3	-

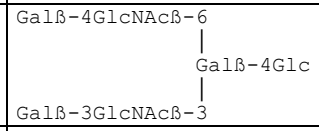
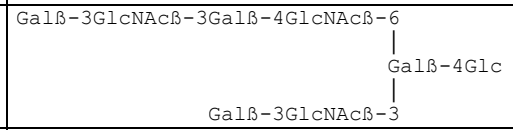
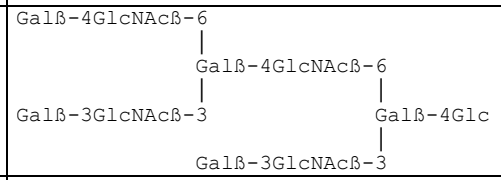
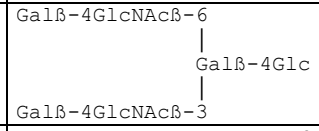
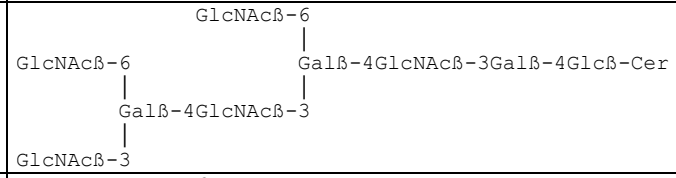
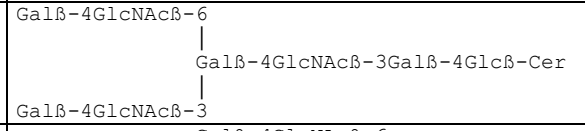
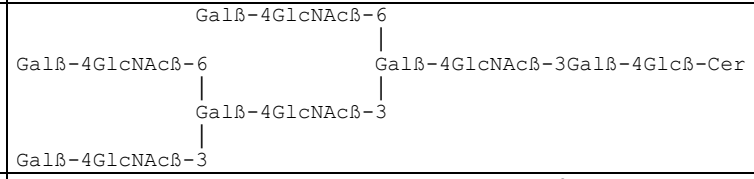
91	SU(3')-Lea-Tri	SU-3Galß-3GlcNAc | Fucα-4	-
92	SU(3')-Lex-Tri	SU-3Galß-4GlcNAc | Fucα-3	-
93	NeuAcα-(3')LN	NeuAcα-3Galß-4GlcNAc	-
94	NeuAcα-(3')LN-AO	NeuAcα-3Galß-4GlcNAc-AO	-
95	PI-1	NeuAcα-3(6-NAc)Galß-4GlcNAc	-
96	PI-1-AO	NeuAcα-3(6-NAc)Galß-4GlcNAc-AO	-
97	PI-2	NeuAcα-3(6-NBz)Galß-4GlcNAc	-
98	PI-2-AO	NeuAcα-3(6-NBz)Galß-4GlcNAc-AO	-
99	NeuAcα-(6')LN	NeuAcα-6Galß-4GlcNAc	-
100	Neu5,9Ac-(6')LN	Neu5,9Acα-6Galß-4GlcNAc	-
101	SA(3')-Lea-Tri	NeuAcα-3Galß-3GlcNAc | Fucα-4	-
102	GSC-440	NeuAcα-3Galß-4GlcNAcß-C30 | Fucα-3	-
103	GSC-512	Neu4,5Acα-3Galß-4GlcNAcß-C30 | Fucα-3	-
104	GSC-513	Neu5,9Acα-3Galß-3GlcNAcß-C30 | Fucα-4	-
105	GSC-511	Neu5,9Acα-3Galß-4GlcNAcß-C30 | Fucα-3	-
	Lacto-N-neotetraose and Lacto-N tetraose-based		
106	GSC-225	(3-carboxymethyl)Galß-4GlcNAcß-3Galß-Cer36 | Fucα-3	10
107	GSC-236	SU3 | Galß-4GlcNAcß-3Galß-C30 | Fucα-3	-
108	GSC-479	NeuAcα-3Galß-4GlcNAcß-3Galß-C30 | Fucα-3	-
109	GSC-105	NeuAcα-3Galß-4GlcNAcß-3Galß-Cer36 | Fucα-3	-
110	GSC-121	NeuAcα-3Galß-4GlcNAcß-3Galß-Cer36 | (3-deoxy)Fucα-3	-

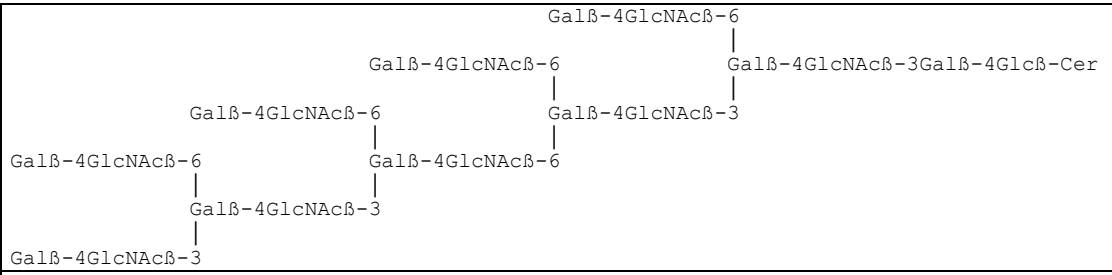
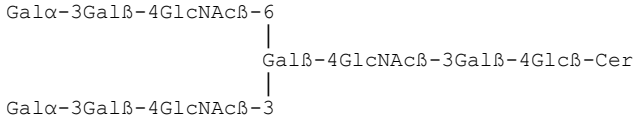
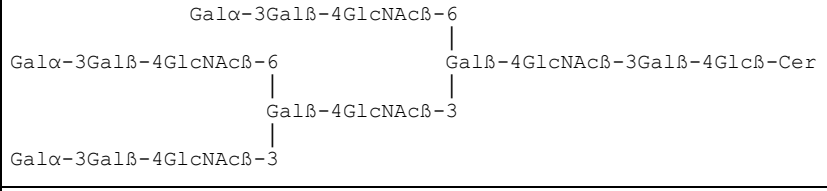
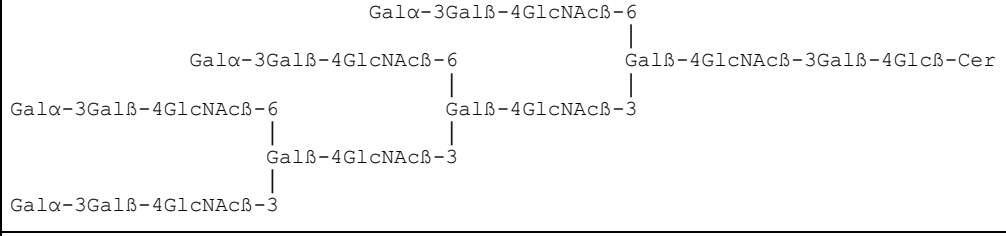
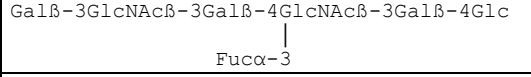
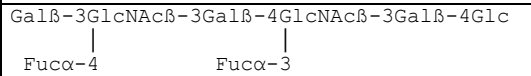
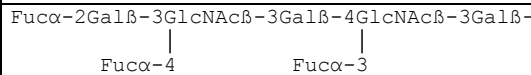
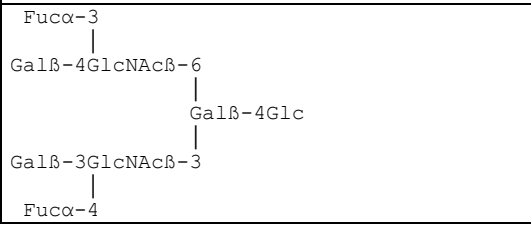
111	GSC-123	NeuAcα-3Galß-4GlcNAcß-3Galß-Cer36 | (4-deoxy)Fucα-3	19
112	GSC-133	NeuAcα-3Galß-4GlcNAcß-3Galß-Cer36 | (2-OMe)Fucα-3	9
113	GSC-131	NeuAcα-3Galß-4GlcNAcß-3Galß-Cer36 | Quvα-3	-
114	GSC-163	NeuAcα-3Galß-4GlcNAcß-3Galß-Cer36 | Rhaα-3	-
115	GSC-127	NeuAcα-3Galß-4GlcNAcß-3Galß-Cer36 | (6-deoxy)L-Talα-3	15
116	GSC-341	KDNα-3Galß-4GlcNAcβ-3Galß-C30 | Fucα-3	-
117	GSC-177	NeuGcα-3Galß-4GlcNAcβ-3Galß-Cer36 | Fucα-3	-
118	GSC-175	NeuAcα-3(4-deoxy)Galß-4GlcNAcß-3Galß-Cer36 | Fucα-3	2
119	GSC-257	NeuAcα-3(4,6-deoxy)Galß-4GlcNAcß-3Galß-Cer36 | Fucα-3	2
120	DLNN	GlcNAcß-3Galß-4Glc	140
121	LNT	Galß-3GlcNAcß-3Galß-4Glc	-
122	Paragloboside	Galß-4GlcNAcß-3Galß-4Glcß-Cer	-
123	LNnT	Galß-4GlcNAcß-3Galß-4Glc	-
124	B-like pentaosylceramide	Galα-3Galß-4GlcNAcß-3Galß-4Glcß-Cer	-
125	Klaus glycolipid	Galß-3Galß-4GlcNAcß-3Galß-4Glcß-Cer	-
126	GSC-207	GlcAß-3Galß-4GlcNAcß-3Galß-4Glcß-C30	-
127	GSC-191	GlcAß-3Galß-4GlcNAcß-3Galß-4Glcß-Cer36	-
128	GSC-189	GlcAß-3Galß-4GlcNAcß-3Galß-4Glcß-Cer42	-
129	SU(3')-Tri	SU-3Galß-4GlcNAcß-3Gal	3
130	GSC-208	SU-3GlcAß-3Galß-4GlcNAcß-3Galß-4Glcß-C30	-
131	GSC-192	SU-3GlcAß-3Galß-4GlcNAcß-3Galß-4Glcß-Cer36	4
132	GSC-190	SU-3GlcAß-3Galß-4GlcNAcß-3Galß-4Glcß-Cer42	-
133	Led-II pentaosylceramide	Fucα-2Galß-3GlcNAcß-3Galß-4Glcß-CerA	-

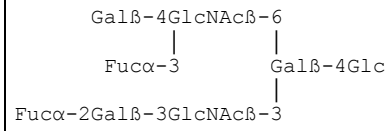
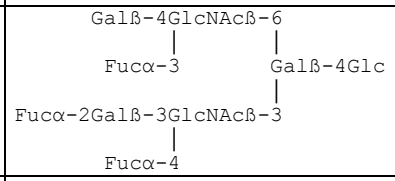
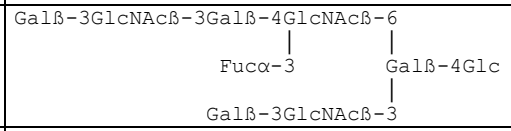
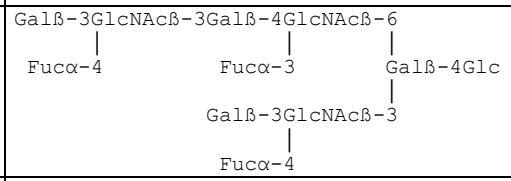
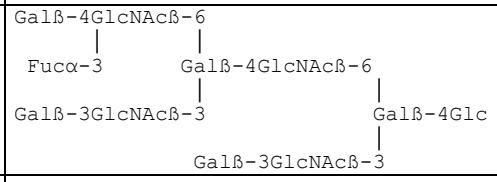
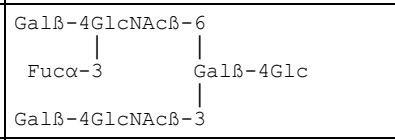
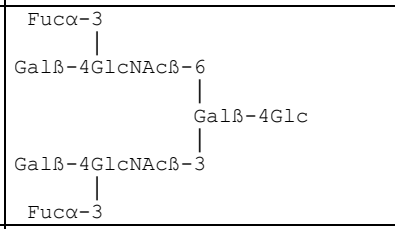
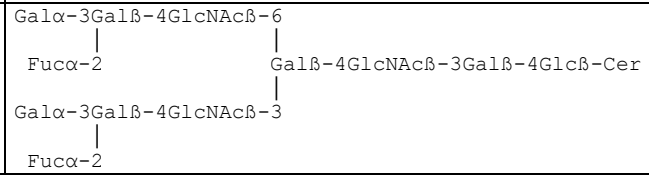
134	Led-I pentaosylceramide	Fucα-2Galß-3GlcNAcß-3Galß-4Glcß-CerB	-
135	LNFP-I	Fucα-2Galß-3GlcNAcß-3Galß-4Glc	-
136	B-hexaosylceramide	Galα-3Galß-4GlcNAcß-3Galß-4Glcß-Cer | Fucα-2	-
137	A-Hexa	GalNAcα-3Galß-3GlcNAcß-3Galß-4Glc | Fucα-2	-
138	A-Hepta	GalNAcα-3Galß-3GlcNAcß-3Galß-4Glc | | Fucα-2 Fucα-4	-
139	LNFP-II	Galß-3GlcNAcß-3Galß-4Glc | Fucα-4	9
140	LNDFH-II	Galß-3GlcNAcß-3Galß-4Glc | | Fucα-4 Fucα-3	-
141	Leb-hexaosylceramide	Fucα-2Galß-3GlcNAcß-3Galß-4Glcß-Cer | Fucα-4	9
142	LNDFH-I	Fucα-2Galß-3GlcNAcß-3Galß-4Glc | Fucα-4	-
143	LNTFH-I	Fucα-2Galß-3GlcNAcß-3Galß-4Glc | | Fucα-4 Fucα-2	3
144	LNFP-III	Galß-4GlcNAcß-3Galß-4Glc | Fucα-3	7
145	LNFP-III-AO	Galß-4GlcNAcß-3Galß-4Glc-AO | Fucα-3	-
146	LNnDFH-I	Fucα-2Galß-4GlcNAcß-3Galß-4Glc | Fucα-3	-
147	LNnDFH-II	Galß-4GlcNAcß-3Galß-4Glc | | Fucα-3 Fucα-3	-
148	LNnDFH-V	Galß-4GlcNAcß-3Galß-4Glc | | Fucα-3 Fucα-2	-
149	LNnTFH-I	Fucα-2Galß-4GlcNAcß-3Galß-4Glc | | Fucα-3 Fucα-2	-
150	SU(3')-LNFP-II	SU-3Galß-3GlcNAcß-4Galß-4Glc | Fucα-4	-

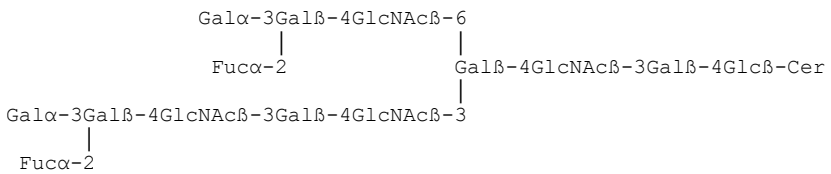
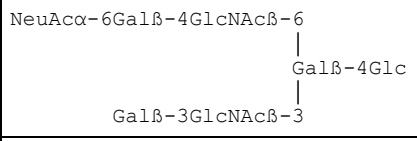
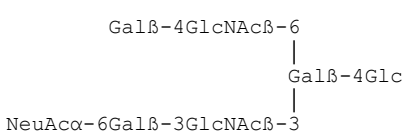
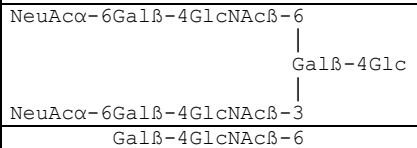
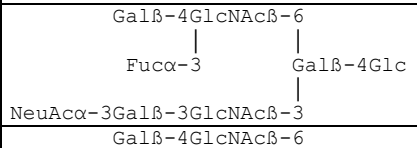
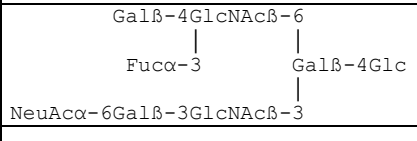
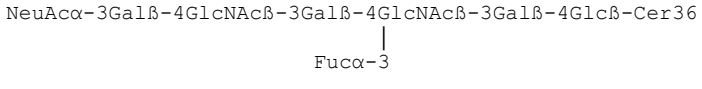
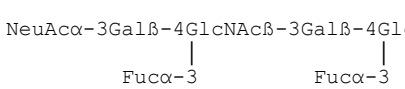
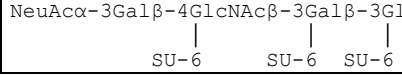
151	SU(6')-LNFP-II	SU-6Galß-3GlcNAcß-3Galß-4Glc | Fucα-4	14
152	SU(6')-LNFP-III	SU-6Galß-4GlcNAcß-3Galß-4Glc | Fucα-3	3
153	SU(3',6)-LNFP-III	SU-6 | SU-3Galß-4GlcNAcß-3Galß-4Glc | Fucα-3	5
154	LSTa	NeuAcα-3Galß-3GlcNAcß-3Galß-4Glc	3
155	GSC-272	NeuAcα-3Galβ-3GlcNAcβ-3Galβ-4Glcß-C30	-
156	GSC-396	NeuGcα-3Galβ-3GlcNAcβ-3Galβ-4Glcß-C30	-
157	LSTb	Galβ-3GlcNAcβ-3Galβ-4Glc | NeuAcα-6	-
158	GSC-397	NeuGcα-6Galβ-3GlcNAcβ-3Galβ-4Glcß-C30	5
159	DSLNT	NeuAcα-3Galß-3GlcNAcß-3Galß-4Glc | NeuAcα-6	7
160	Sialylparagloboside	NeuAcα-3Galß-4GlcNAcß-3Galß-4Glcß-Cer	-
161	GSC-273	NeuAcα-3Galβ-4GlcNAcβ-3Galβ-4Glcß-C30	-
162	GSC-31	NeuAcα-3Galß-4GlcNAcß-3Galß-4Glcß-Cer36	-
163	LSTc	NeuAcα-6Galβ4-GlcNAcβ3-Galβ4-Glc	-
164	GSC-516B	Neuα-3Galß-4GlcNAcß-3Galß-4Glcß-Cer36 | SU-6	-
165	SA(3/6)LNFP-I	NeuAcα-3/6Galß-3GlcNAcß-3Galß-4Glc | Fucα-2	-
166	SA(3')-LNFP-II	NeuAcα-3Galß-3GlcNAcß-3Galß-4Glc | Fucα-4	1
167	SA(6')-LNFP-VI	NeuAcα-6Galß-4GlcNAcß-3Galß-4Glc | Fucα-3	5
168	GSC-533	NeuAcα-3Galß-4GlcNß-3Galß-4Glcß-Cer36 | Fucα-3	1

169	GSC-64		-
170	SA(3')-LNFP-III		9
171	GSC-472		-
172	GSC-97		-
173	GSC-314		3
174	GSC-149		-
175	GSC-311		-
176	GSC-268		-
177	GSC-268 deNAc		1
178	GSC-269		-
179	GSC-406		-
180	GSC-270		-
	Polylactosamine		
181	pLNH	Galß-3GlcNAcß-3Galß-4GlcNAcß-3Galß-4Glc	7
182	pLNnH	Galß-4GlcNAcß-3Galß-4GlcNAcß-3Galß-4Glc	7
183	GSC-216	GlcAß-3Galß-4GlcNAcß-3Galß-4GlcNAcß-3Galß-4Glcß-Cer42	-

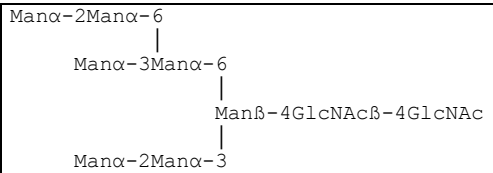
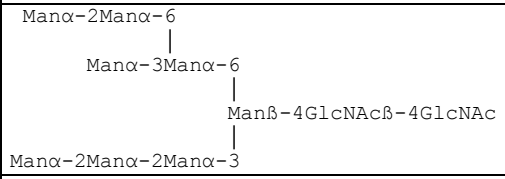
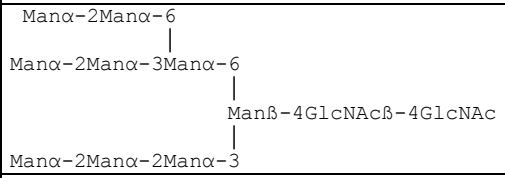
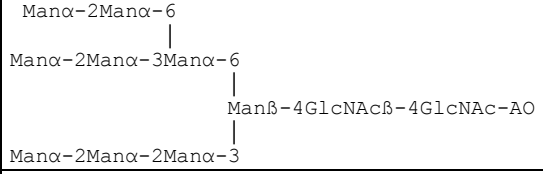
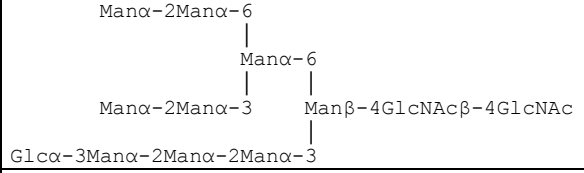
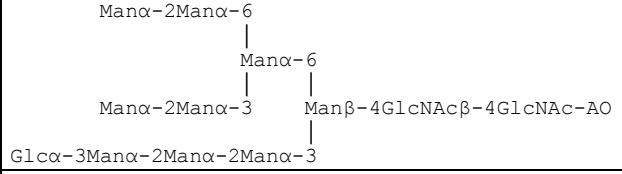
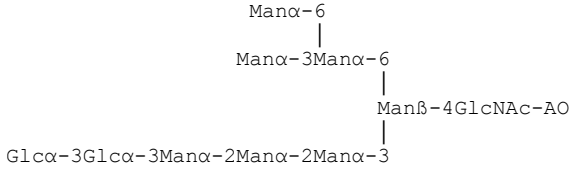
184	GSC-217	SU-3GlcAß-3Galß-4GlcNAcß-3Galß-4GlcNAcß-3Galß-4Glcß-Cer42	-
185	GSC-218	GlcAß-3Galß-4GlcNAcß-3Galß-4GlcNAcß-3Galß-4Glcß-Cer36	-
186	GSC-219	SU-3GlcAß-3Galß-4GlcNAcß-3Galß-4GlcNAcß-3Galß-4Glcß-Cer36	-
187	LNH		-
188	iLNO		-
189	LND		-
190	LNnH		3
191	Nonaosylceramide		8
192	I-octaosylceramide		-
193	I-dodecaosylceramide		-
194	I-hexadecaosylceramide		-

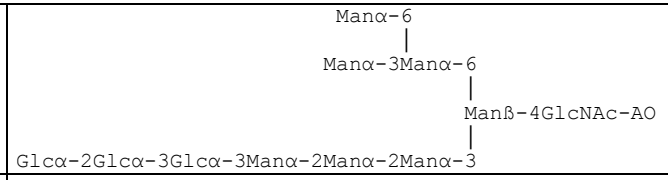
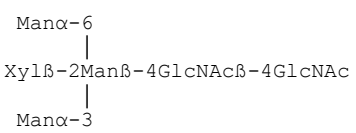
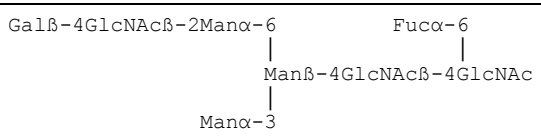
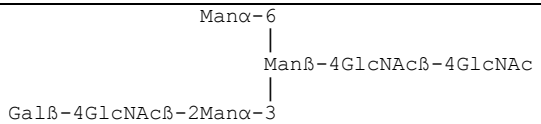
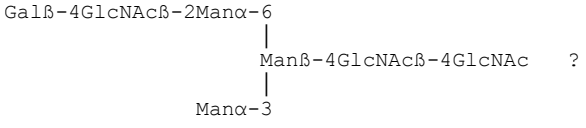
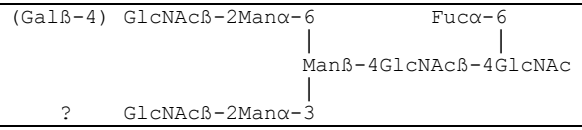
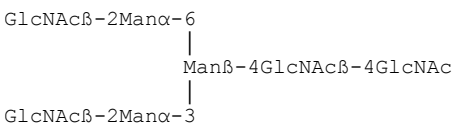
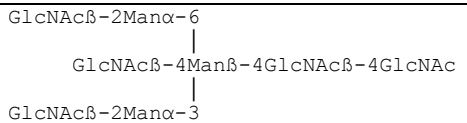
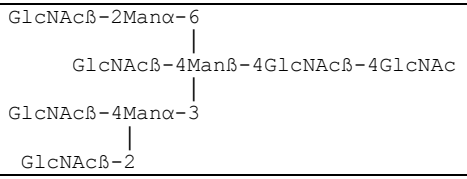
195	I-eicosaosylceramide		-
196	B-like decaosylceramide		-
197	B-like pentadecaosylceramide		5
198	B-like eicosaosylceramide		-
199	pLNFH-IV		-
200	DFpLNH-II		14
201	TFpLNH-I		12
202	DFLNH(b)		-

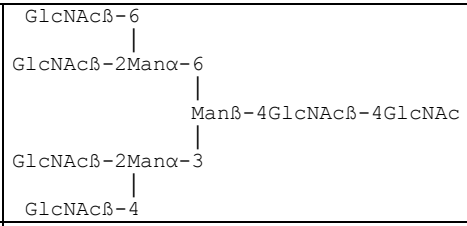
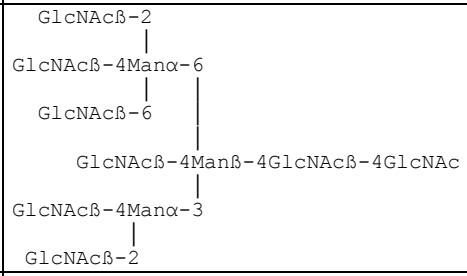
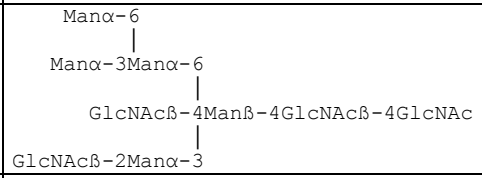
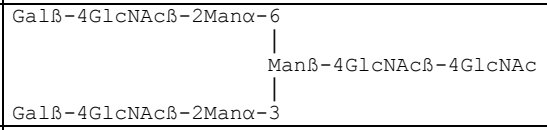
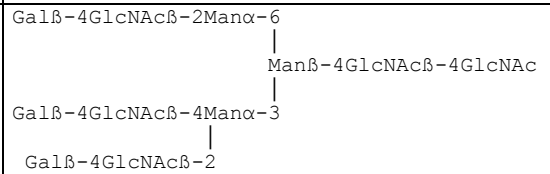
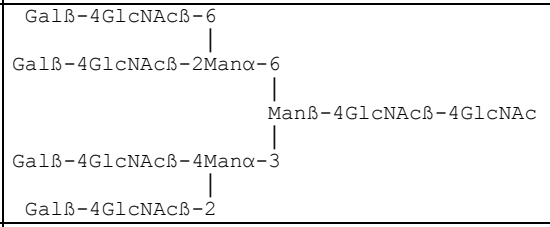
203	DFLNH(a)		-
204	TFLNH		7
205	MFiLNO-IV		-
206	TFiLNO		-
207	MFLND		-
208	MFLNnH(a)		3
209	DFLNnH		-
210	B-III dodecaosylceramide		9

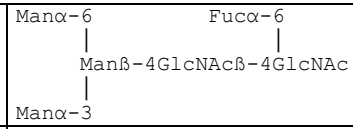
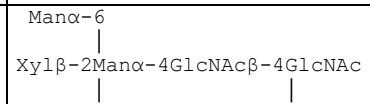
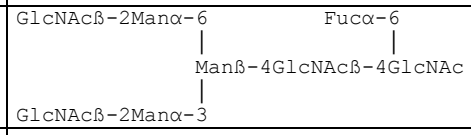
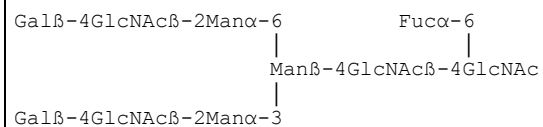
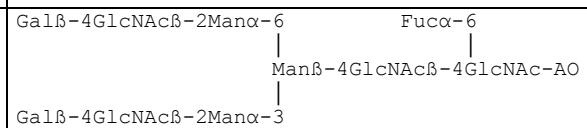
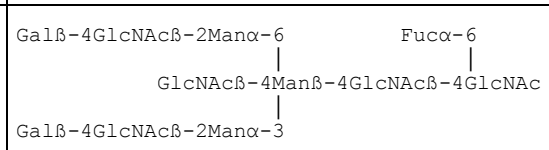
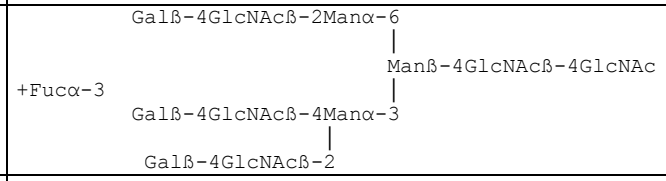
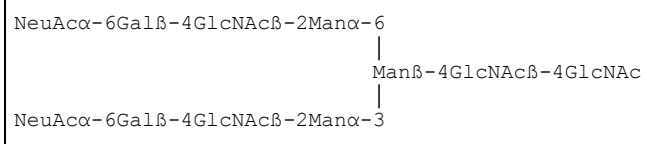
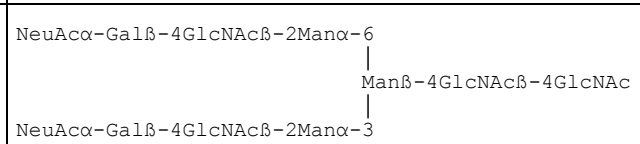
211	B-IV tetradecaosylceramide		-
212	MSLNH		-
213	MSLNnH-I		-
214	DSLNnH		11
215	MSMFLNH		-
216	MFMSLNnH		6
217	GSC-221		-
218	GSC-220		-
219	C4U		-
	N-glycan-related		
220	Man2(α2)	Manα-2Man	15
221	Man2(α3)	Manα-3Man	3
222	Man2(α6)	Manα-6Man	-

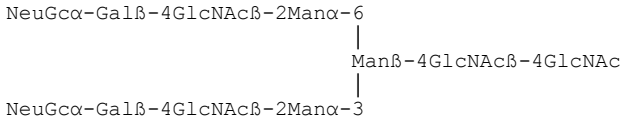
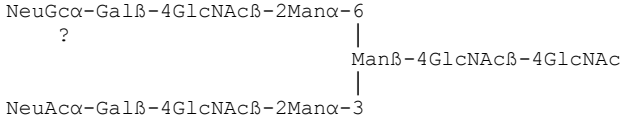
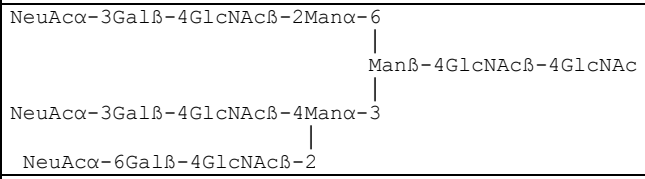
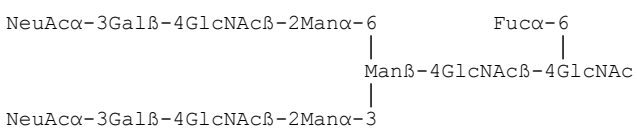
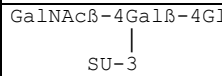
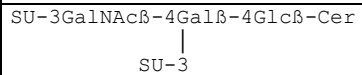
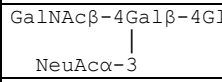
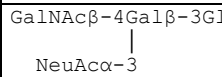
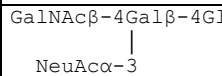
223	Man3(α3,α6)	Manα-6Man | Manα-3	-
224	Man5(α3,α6)	Manα-6Manα-6Man | | Manα-3 Manα-3	-
225	Man1GN1	Manß-4GlcNAc	3
226	Man2GN1	Manα-3Manß-4GlcNAc	-
227	Man2aGN2	Manα-6Manß-4GlcNAcß-4GlcNAc	-
228	Man4aGN2	Manα-3Manα-6 | Manß-4GlcNAcß-4GlcNAc | Manα-3	-
229	Man4bGN2	Manα-6 | Manα-3Manα-6 | Manß-4GlcNAcß-4GlcNAc	11
230	Man5GN2	Manα-6 | Manα-3Manα-6 | Manß-4GlcNAcß-4GlcNAc | Manα-3	9
231	Man6GN2	Manα-6 | Manα-3Manα-6 | Manß-4GlcNAcß-4GlcNAc | Manα-2Manα-3	13
232	Man7(D1)GN2	Manα-6 | Manα-3Manα-6 | Manß-4GlcNAcß-4GlcNAc | Manα-2Manα-2Manα-3	4
233	Man7(D1)GN2-AO	Manα-6 | Manα-3Manα-6 | Manß-4GlcNAcß-4GlcNAc-AO | Manα-2Manα-2Manα-3	-

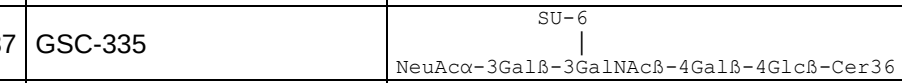
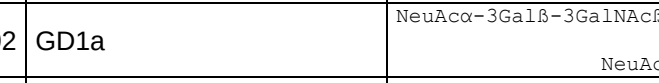
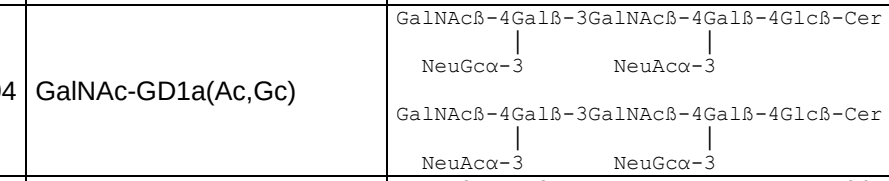
234	Man7(D3)GN2		-
235	Man8(D1D3)GN2		-
236	Man9GN2		5
237	Man9GN2-AO		-
238	Glc1Man9GN2		26
239	Glc1Man9GN2-AO		-
240	Glc2Man7(D1)GN1-AO		-

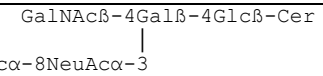
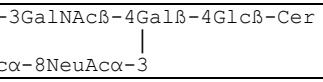
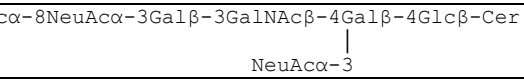
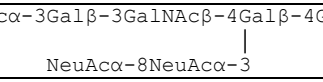
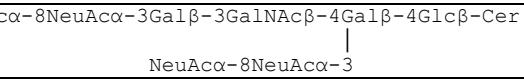
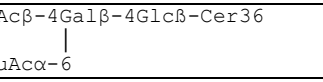
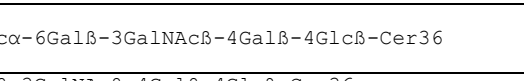
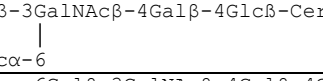
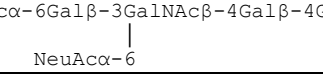
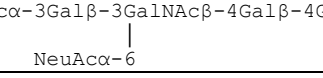
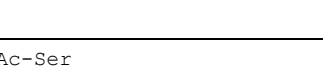
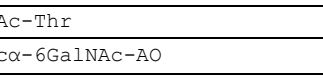
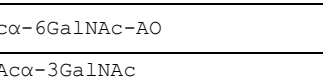
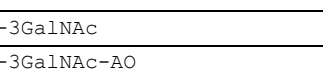
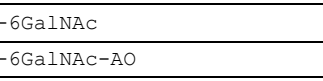
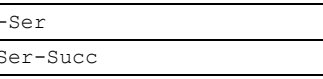
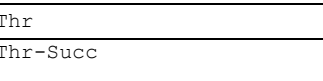
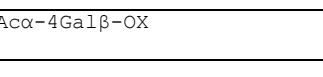
241	Glc3Man7(D1)GN1-AO		-
242	Man3XylGN2		-
243	N1		56
244	N2		-
245	N4		7
246	N3		4
247	NGA2		1
248	NGA2B		8
249	NGA3B		-

250	NGA4		-
251	NGA5B		-
252	GNMan5BGN2		-
253	NA2		-
254	NA3		-
255	NA4		4
256	Fuc-GlcNAc		14

257	Man3FGN2		7
258	Man3FXylGN2		-
259	NGA2F		9
260	NA2F		-
261	NA2F-AO		-
262	NA2FB		-
263	NA3-Lex		-
264	A2(2-6)		-
265	AGP-Bi-Ac2		-

266	AGP-Bi-Gc2		-
267	AGP-Bi-AcGc		-
268	A3		-
269	A2F(2-3)		2
	Gangliosides		
270	GM4	NeuAcα-3Galβ-Cer	-
271	SM3	SU-3Galβ-4Glcß-Cer	-
272	Haematoside	NeuAcα-3Galß-4Glcß-Cer	-
273	GM3	NeuAcα-3Galß-4Glcß-Cer	-
274	GM3(Gc)	NeuGcα-3Galß-4Glc-Cer	-
275	Asialo-GM2	GalNAcβ-4Galβ-4Glcβ-Cer	-
276	SM2		-
277	SB2		-
278	GM2		-
279	GSC-576		-
280	GSC-108		-

281	GSC-193		-
282	Asialo-GM1	Galβ-3GalNAcβ-4Galβ-4Glcβ-Cer	-
283	Asialo-GM1-Tetra	Galß-3GalNAcß-4Galß-4Glc	4
284	SM1a		-
285	SB1a		-
286	GM1b	NeuAcα-3Galβ-3GalNAcß-4Galß-4Glcß-Cer*	-
287	GSC-335		-
288	GM1		-
289	GM1-penta		-
290	GM1(Gc)		-
291	GM1(Gc)-penta		6
292	GD1a		-
293	GD1a-hexa		-
294	GalNAc-GD1a(Ac,Gc)		-
295	GSC-195		-
296	GD3	NeuAcα-8NeuAcα-3Galß-4Glcß-Cer	-
297	GD3-tetra	NeuAcα-8NeuAcα-3Galß-4Glc	-
298	GD3-tetra-AO	NeuAcα-8NeuAcα-3Galß-4Glc-AO	-

299	GD2		-
300	GD1b		-
301	GT1a		-
302	GT1b		13
303	GQ1b		-
304	GSC-442		-
305	GSC-68		-
306	GSC-155		-
307	GSC-107		-
308	GSC-118		-
	O-glycan related		
309	GalNAc-Ser		-
310	GalNAc-Thr		-
311	BSM-Di-A1-AO		-
312	BSM-Di-A2-AO		-
313	GalNAcα-3GalNAc		-
314	Galß-3GalNAc		-
315	Galß-3GalNAc-AO		12
316	Galß-6GalNAc		-
317	Galß-6GalNAc-AO		-
318	Man-Ser		10
319	Man-Ser-Succ		-
320	Man-Thr		-
321	Man-Thr-Succ		-
322	A8/1		12

323	A8/2	SU-6 | Fucα-3GlcNAcß-OY	-
324	A15/1	SU-6GlcNAcß-OY	-
325	A15/3	GlcNAcα-4Galβ-3Galβ-OX | Fucα-2	-
326	Notch-1	Fucα-Thr	-
327	Notch-2	GlcNAcβ-3Fucα-Thr	-
328	Notch-3	Galβ-4GlcNAcβ-3Fucα-Thr	-
329	GSC-488	NeuAcα-3Galß-3GalNAcß-C30	-
330	GSC-491	NeuAcα-3Galß-3(6-deoxy-6-CH2COOH)GalNAcß-C30	-
331	GSC-489	SU-6 | NeuAcα-3Galß-3GalNAcß-C30	-
332	DST	NeuAcα-3Galß-3GalNAc | NeuAcα-6	-
333	GSC-490	NeuAcα-3Galß-3GalNAcß-C30 | NeuAcα-6	-
334	GlcNAcß1-2Fuc-AO	GlcNAcß1-2Fuc-AO	-
335	GlcNAcß1-4Fuc-AO	GlcNAcß1-4Fuc-AO	-
	Poly-sialyl		
336	SA2(α8)	NeuAcα-8NeuAc	12
337	SA3(α8)	NeuAcα-8NeuAcα-8NeuAc	1
338	SA4(α8)	NeuAcα-8NeuAcα-8NeuAcα-8NeuAc	-
339	SA5(α8)	NeuAcα-8NeuAcα-8NeuAcα-8NeuAcα-8NeuAc*	-
340	SA6(α8)	NeuAcα-8NeuAcα-8NeuAcα-8NeuAcα-8NeuAcα-8NeuAc*	-
341	SA7(α8)	NeuAcα-8NeuAcα-8NeuAcα-8NeuAcα-8NeuAcα-8NeuAcα-8NeuAc*	-
342	SA8(α8)	NeuAcα-8NeuAcα-8NeuAcα-8NeuAcα-8NeuAcα-8NeuAc-8NeuAcα-8NeuAc*	-
343	SA9(α8)	NeuAcα-8NeuAcα-8NeuAcα-8NeuAcα-8NeuAcα-8NeuAc-8NeuAcα-8NeuAc-8NeuAcα*	-
344	SA10(α8)	NeuAcα-8NeuAcα-8NeuAcα-8NeuAcα-8NeuAcα-8NeuAc-8NeuAcα-8NeuAcα-8NeuAcα-8NeuAc*	-
	Glycosaminoglycan-related		
345	HA-S4	GlcAß-3GlcNAcß-4GlcAß-3GlcNA*	-
346	HA-S14	GlcAß-3GlcNAcß-4GlcAß-3GlcNAcß-4GlcAß-3GlcNAcß-4GlcAß-3GlcNAcß-4GlcAß-3GlcNAcß-4GlcAß-3GlcNAcß-4GlcAß-3GlcNA*	-
347	Hep-Di IS	ΔUA-4GlcNS | | SU-2 6-SU	-
348	Hep-Di-IS-AO	ΔUA-4GlcNS-AO | | SU-2 6-SU	-

349	CSA-4	ΔUA-3GalNAcß-4GlcAß-3GalNAc* | | SU-4 SU-4	-
350	CSA-14	ΔUA-3GalNAcß-4GlcAß-3GalNAcß-4GlcAß-3GalNAcß-4GlcAß-3GalNAcß-4GlcAß-3GalNAcß-4GlcAß- | | | | | SU-4 SU-4 SU-4 SU-4 SU-4 -3GalNAcß-4GlcAß-3GalNAc* | | SU-4 SU-4	-
351	CSB-4	ΔUA-3GalNAcß-4IdoAα-3GalNAc* | | SU-4 SU-4	4
352	CSB-14	ΔUA-3GalNAcß-4IdoAα-3GalNAcß-4IdoAα-3GalNAcß-4IdoAα-3GalNAcß-4IdoAα-3GalNAcß-4IdoAα- | | | | | SU-4 SU-4 SU-4 SU-4 SU-4 -3GalNAcß-4IdoAα-3GalNAc* | | SU-4 SU-4	11
353	CSC-4	ΔUA-3GalNAcß-4GlcAß-3GalNAc* | | SU-6 SU-6	-
354	CSC-14	ΔUA-3GalNAcß-4GlcAß-3GalNAcß-4GlcAß-3GalNAcß-4GlcAß-3GalNAcß-4GlcAß-3GalNAcß-4GlcAß- | | | | | SU-6 SU-6 SU-6 SU-6 SU-6 -3GalNAcß-4GlcAß-3GalNAc* | | SU-6 SU-6	14
	Homo-oligomers		
355	GN2	GlcNAcß-4GlcNAc	-
356	GN3	GlcNAcß-4GlcNAcß-4GlcNAc	8
357	Man4(ß4)	Manß-4Manß-4Manß-4Man	-
358	Man5(ß4)	Manß-4Manß-4Manß-4Manß-4Man	7
359	Man6(ß4)	Manß-4Manß-4Manß-4Manß-4Manß-4Man	-
360	Xyl5(ß4)	Xylß-4Xylß-4Xylß-4Xylß-4Xyl	-
361	Xyl6(ß4)	Xylß-4Xylß-4Xylß-4Xylß-4Xylß-4Xyl	-
362	Ara6(α5)	Araα-5Araα-5Araα-5Araα-5Araα-5Ara	7
363	Ara7(α5)	Araα-5Araα-5Araα-5Araα-5Araα-5Araα-5Ara	6
364	Glc2(α2)-AO	Glcα-2Glc-AO	-
365	Glc2(α3)-AO	Glcα-3Glc-AO	-
366	Malto-2-AO	Glcα-4Glc-AO	6
367	Malto-3-AO	Glcα-4Glcα-4Glc-AO	3
368	Malto-4-AO	Glcα-4Glcα-4Glcα-4Glc-AO	-
369	Malto-5-AO	Glcα-4Glcα-4Glcα-4Glcα-4Glc-AO	-

370	Malto-6-AO	Glcα-4Glcα-4Glcα-4Glcα-4Glcα-4Glc-AO	18
371	Malto-7-AO	Glcα-4Glcα-4Glcα-4Glcα-4Glcα-4Glcα-4Glc-AO	15
372	Malto-8-AO	Glcα-4Glcα-4Glcα-4Glcα-4Glcα-4Glcα-4Glcα-4Glc-AO*	-
373	Malto-9-AO	Glcα-4Glcα-4Glcα-4Glcα-4Glcα-4Glcα-4Glcα-4Glcα-4Glc-AO*	5
374	Malto-10-AO	Glcα-4Glcα-4Glcα-4Glcα-4Glcα-4Glcα-4Glcα-4Glcα-4Glcα-4Glc-AO*	-
375	Malto-11-AO	Glcα-4Glcα-4Glcα-4Glcα-4Glcα-4Glcα-4Glcα-4Glcα-4Glcα-4Glcα-4Glc-AO*	-
376	Malto-12-AO	Glcα-4Glcα-4Glcα-4Glcα-4Glcα-4Glcα-4Glcα-4Glcα-4Glcα-4Glcα-4Glcα-4Glc-AO*	5
377	Malto-13-AO	Glcα-4Glcα-4Glcα-4Glcα-4Glcα-4Glcα-4Glcα-4Glcα-4Glcα-4Glcα-4Glcα-4Glcα-4Glc-AO*	-
378	Dextran-2-AO	Glcα-6Glc-AO	22
379	Dextran-3-AO	Glcα-6Glcα-6Glc-AO	-
380	Dextran-4-AO	Glcα-6Glcα-6Glcα-6Glc-AO	-
381	Dextran-5-AO	Glcα-6Glcα-6Glcα-6Glcα-6Glc-AO	-
382	Dextran-6-AO	Glcα-6Glcα-6Glcα-6Glcα-6Glcα-6Glc-AO	-
383	Dextran-7-AO	Glcα-6Glcα-6Glcα-6Glcα-6Glcα-6Glcα-6Glc-AO	19
384	Dextran-8-AO	Glcα-6Glcα-6Glcα-6Glcα-6Glcα-6Glcα-6Glcα-6Glc-AO*	6
385	Dextran-9-AO	Glcα-6Glcα-6Glcα-6Glcα-6Glcα-6Glcα-6Glcα-6Glcα-6Glc-AO*	18
386	Dextran-10-AO	Glcα-6Glcα-6Glcα-6Glcα-6Glcα-6Glcα-6Glcα-6Glcα-6Glcα-6Glc-AO*	-
387	Dextran-11-AO	Glcα-6Glcα-6Glcα-6Glcα-6Glcα-6Glcα-6Glcα-6Glcα-6Glcα-6Glcα-6Glc-AO*	-
388	Dextran-12-AO	Glcα-6Glcα-6Glcα-6Glcα-6Glcα-6Glcα-6Glcα-6Glcα-6Glcα-6Glcα-6Glcα-6Glc-AO*	9
389	Dextran-13-AO	Glcα-6Glcα-6Glcα-6Glcα-6Glcα-6Glcα-6Glcα-6Glcα-6Glcα-6Glcα-6Glcα-6Glcα-6Glc-AO*	26
390	Lam-2-AO	Glcß-3Glc-AO	-
391	Lam-3-AO	Glcß-3Glcß-3Glc-AO	15
392	Lam-4-AO	Glcß-3Glcß-3Glcß-3Glc-AO	-
393	Lam-5-AO	Glcß-3Glcß-3Glcß-3Glcß-3Glc-AO	71
394	Lam-6-AO	Glcß-3Glcß-3Glcß-3Glcß-3Glcß-3Glc-AO	-
395	Lam-7-AO	Glcß-3Glcß-3Glcß-3Glcß-3Glcß-3Glcß-3Glc-AO	22
396	Curd-8-AO	Glcß-3Glcß-3Glcß-3Glcß-3Glcß-3Glcß-3Glcß-3Glc-AO*	10
397	Curd-9-AO	Glcß-3Glcß-3Glcß-3Glcß-3Glcß-3Glcß-3Glcß-3Glcß-3Glc-AO*	-
398	Curd-10-AO	Glcß-3Glcß-3Glcß-3Glcß-3Glcß-3Glcß-3Glcß-3Glcß-3Glcß-3Glc-AO*	-
399	Curd-11-AO	Glcβ-3Glcβ-3Glcβ-3Glcβ-3Glcβ-3Glcβ-3Glcβ-3Glcβ-3Glcβ-3Glcβ-3Glc-AO*	-
400	Curd-12-AO	Glcß-3Glcß-3Glcß-3Glcß-3Glcß-3Glcß-3Glcß-3Glcß-3Glcß-3Glcß-3Glcß-3Glc-AO*	18
401	Curd-13-AO	Glcβ-3Glcβ-3Glcβ-3Glcβ-3Glcβ-3Glcβ-3Glcβ-3Glcβ-3Glcβ-3Glcβ-3Glcβ-3Glcβ-3Glc-AO*	-
402	Cello-2-AO	Glcß-4Glc-AO	-
403	Cello-3-AO	Glcß-4Glcß-4Glc-AO	-
404	Cello-4-AO	Glcß-4Glcß-4Glcß-4Glc-AO	13
405	Cello-5-AO	Glcß-4Glcß-4Glcß-4Glcß-4Glc-AO	-
406	Cello-6-AO	Glcß-4Glcß-4Glcß-4Glcß-4Glcß-4Glc-AO	12
407	Pust-2-AO	Glcß-6Glc-AO	7

408	Pust-3-AO	Glcß-6Glcß-6Glc-AO	8
409	Pust-4-AO	Glcß-6Glcß-6Glcß-6Glc-AO	18
410	Pust-5-AO	Glcß-6Glcß-6Glcß-6Glcß-6Glc	11
411	Pust-6-AO	Glcß-6Glcß-6Glcß-6Glcß-6Glcß-6Glc-AO	-
412	Pust-7-AO	Glcß-6Glcß-6Glcß-6Glcß-6Glcß-6Glcß-6Glc-AO	10
413	Pust-8-AO	Glcß-6Glcß-6Glcß-6Glcß-6Glcß-6Glcß-6Glcß-6Glc-AO*	-
414	Pust-9-AO	Glcß-6Glcß-6Glcß-6Glcß-6Glcß-6Glcß-6Glcß-6Glcß-6Glc-AO*	-
415	Pust-10-AO	Glcβ-6Glcβ-6Glcβ-6Glcβ-6Glcβ-6Glcβ-6Glcβ-6Glcβ-6Glcβ-6Glc-AO*	15
416	Pust-11-AO	Glcß-6Glcß-6Glcß-6Glcß-6Glcß-6Glcß-6Glcß-6Glcß-6Glcß-6Glcß-6Glc-AO*	21
417	Pust-12-AO	Glcß-6Glcß-6Glcß-6Glcß-6Glcß-6Glcß-6Glcß-6Glcß-6Glcß-6Glcß-6Glcß-6Glc-AO*	22
	Miscellaneous		
418	Gal	Gal	18
419	Gal-AO	Gal-AO	5
420	GalNAc	GalNAc	85
421	GalNAc-AO	GalNAc-AO	-
422	Glc	Glc	4
423	Glc-AO	Glc-AO	9
424	GN	GlcNAc	-
425	GN-AO	GlcNAc-AO	-
426	Man	Man	12
427	Man-AO	Man-AO	-
428	Fuc	Fuc	59
429	Fuc-AO	Fuc-AO	-
430	NeuAc	NeuAc	-
431	NeuAc-AO	NeuAc-AO	-
432	NeuGc	NeuGc	-
433	NeuGc-AO	NeuGc-AO	14
434	Rha	Rha	11
435	Rha-AO	Rha-AO	-
436	Galα-6Glc-AO	Galα-6Glc-AO	-
437	(6P)-Glc-AO	P-6Glc-AO	4
438	(6P)-Man	P-6Man	28
439	(6P)-Man-AO	P-6Man-AO	23
440	(6P)-Man5	P-6Manα-3Manα-3Manα-3Manα-2Man	5
441	(6P)-Fructose-AO	P-6Fructose-AO	3
442	SU-Tyr	SU-Tyr	-
443	GN-Asn	GlcNAc-Asn	-

444	Xyl3Glc4	Glcß-4Glcß-4Glcß-4Glc | | | Xylα-6 Xylα-6 Xylα-6	9
445	GSC-284	GalNAcβ-6Galβ-4Glcß-Cer36 | NeuAcα-3	-
446	GSC-575	GalNAcβ-4Galβ-3Galß-C30 | NeuAcα-3	-
447	GSC-70	NeuAcα-6Galß-6GalNAcß-4Galß-4Glcß-Cer36	-
448	GSC-154	NeuAcα-3Galß-4GlcNAcß-6Galß-4Glcß-Cer36 | Fucα-3	-
449	GSC-446	NeuAcα-3Galß-4GlcNAcß-6GalNAcα-3Galß-4Glc-C30	-
450	GSC-441	NeuAcα-3Galß-4GlcNAcß-6GalNAcα-3Galß-4Glcß-C30	-
451	GSC-384	NeuAcα-3Galß-4GlcNAcß-4GalNAcß-3Galß-4Glcß-C30 | Fucα-3	-
452	Glc(α6,α4,α4)	Glcα-6Glcα-4Glcα-4Glc	-

Supplementary Table 1. Glycan microarray binding studies using the neoglycolipid-based microarray.
The mean fluorescence signal is indicated for each glycan at 7 fmol spots printed in duplicate, as illustrated in Figure 4B. None of the scores are significant.
[a]Pos, Probe position in the microarray.
[b]The oligosaccharide probes are all lipid-linked, neoglycolipids (NGLs) or glycolipids and are from the collection assembled in the course of research in the Glycosciences Laboratory, Imperial College. Unless otherwise specified the NGLs are prepared from reducing oligosaccharides by reductive amination with the amino lipid, 1,2-dihexadecyl-*sn*-glycero-3-phosphoethanolamine (DHPE) (14); AO, NGLs prepared from reducing oligosaccharides by oxime ligation with an aminooxy (AO) functionalized DHPE (15); Cer, natural glycolipids with various ceramide moieties; CerA and CerB denote different natural ceramides; Cer36 and Cer42, synthetic glycolipids with ceramide having a total of 32 and 42 carbon atoms, respectively; C30, a synthetic lipid [2-(tetradecyl)hexadecanol] with 30 carbon atoms. UA, 4,5-unsaturated hexuronic acid; aMan, 2,5-anhydro-mannose; aGal, 3,6-anhydro-galactose.
*Major component.

Position	Glycan	Fluorescence
1	Neu5Aca2-8Neu5Acb-Sp17	11
2	Neu5Aca2-8Neu5Aca2-8Neu5Acb-Sp8	21
3	Neu5Gcb2-6Galb1-4GlcNAc-Sp8	75
4	Galb1-3GlcNAcb1-2Mana1-3(Galb1-3GlcNAcb1-2Mana1-6)Manb1-4GlcNAcb1-4GlcNAcb-Sp19	16
5	Gala-Sp8	16
6	Glca-Sp8	15
7	Mana-Sp8	11
8	GalNAca-Sp8	40
9	Fuca-Sp8	16
10	Fuca-Sp9	28
11	Rha-Sp8	10
12	Neu5Aca-Sp8	64
13	Neu5Aca-Sp11	13
14	Neu5Acb-Sp8	47
15	Galb-Sp8	24
16	Glcb-Sp8	297
17	Manb-Sp8	4
18	GalNAcb-Sp8	19
19	GlcNAcb-Sp0	30
20	GlcNAcb-Sp8	29
21	GlcN(Gc)b-Sp8	10
22	Galb1-4GlcNAcb1-3(Galb1-4GlcNAcb1-6)GalNAca-Sp8	22
23	GlcNAcb1-3(GlcNAcb1-4)(GlcNAcb1-6)GlcNAc-Sp8	21
24	[3OSO3][6OSO3]Galb1-4[6OSO3]GlcNAcb-Sp0	97
25	[3OSO3][6OSO3]Galb1-4GlcNAcb-Sp0	25
26	[3OSO3]Galb1-4Glcb-Sp8	29
27	[3OSO3]Galb1-4[6OSO3]Glcb-Sp0	32
28	[3OSO3]Galb1-4[6OSO3]Glcb-Sp8	13
29	[3OSO3]Galb1-3(Fuca1-4)GlcNAcb-Sp8	35

30	[3OSO3]Galb1-3GalNAca-Sp8	31
31	[3OSO3]Galb1-3GlcNAcb-Sp8	26
32	[3OSO3]Galb1-4(Fuca1-3)GlcNAcb-Sp8	37
33	[3OSO3]Galb1-4[6OSO3]GlcNAcb-Sp8	49
34	[3OSO3]Galb1-4GlcNAcb-Sp0	17
35	[3OSO3]Galb1-4GlcNAcb-Sp8	33
36	[3OSO3]Galb-Sp8	37
37	[4OSO3][6OSO3]Galb1-4GlcNAcb-Sp0	26
38	[4OSO3]Galb1-4GlcNAcb-Sp8	13
39	6-H2PO3Mana-Sp8	0
40	[6OSO3]Galb1-4Glcb-Sp0	50
41	[6OSO3]Galb1-4Glcb-Sp8	13
42	[6OSO3]Galb1-4GlcNAcb-Sp8	49
43	[6OSO3]Galb1-4[6OSO3]Glcb-Sp8	36
44	Neu5Aca2-3[6OSO3]Galb1-4GlcNAcb-Sp8	14
45	[6OSO3]GlcNAcb-Sp8	27
46	Neu5Ac(9Ac)a-Sp8	4
47	Neu5Ac(9Ac)a2-6Galb1-4GlcNAcb-Sp8	29
48	Mana1-3(Mana1-6)Manb1-4GlcNAcb1-4GlcNAcb-Sp13	32
49	GlcNAcb1-2Mana1-3(GlcNAcb1-2Mana1-6)Manb1-4GlcNAcb1-4GlcNAcb-Sp13	37
50	Galb1-4GlcNAcb1-2Mana1-3(Galb1-4GlcNAcb1-2Mana1-6)Manb1-4GlcNAcb1-4GlcNAcb-Sp12	13
51	Galb1-4GlcNAcb1-2Mana1-3(Galb1-4GlcNAcb1-2Mana1-6)Manb1-4GlcNAcb1-4GlcNAcb-Sp13	70
52	Neu5Aca2-6Galb1-4GlcNAcb1-2Mana1-3(Neu5Aca2-6Galb1-4GlcNAcb1-2Mana1-6)Manb1-4GlcNAcb1-4GlcNAcb-Sp12	9
53	Neu5Aca2-6Galb1-4GlcNAcb1-2Mana1-3(Neu5Aca2-6Galb1-4GlcNAcb1-2Mana1-6)Manb1-4GlcNAcb1-4GlcNAcb-Sp13	71
54	Neu5Aca2-6Galb1-4GlcNAcb1-2Mana1-3(Neu5Aca2-6Galb1-4GlcNAcb1-2Mana1-6)Manb1-4GlcNAcb1-4GlcNAcb-Sp8	119
55	Fuca1-2Galb1-3GalNAcb1-3Gala-Sp9	21
56	Fuca1-2Galb1-3GalNAcb1-3Gala1-4Galb1-4Glcb-Sp9	50
57	Fuca1-2Galb1-3(Fuca1-4)GlcNAcb-Sp8	9
58	Fuca1-2Galb1-3GalNAca-Sp8	18
59	Fuca1-2Galb1-3GalNAcb1-4(Neu5Aca2-3)Galb1-4Glcb-Sp0	25
60	Fuca1-2Galb1-3GalNAcb1-4(Neu5Aca2-3)Galb1-4Glcb-Sp9	19
61	Fuca1-2Galb1-3GlcNAcb1-3Galb1-4Glcb-Sp10	22

62	Fuca1-2Galb1-3GlcNAcb1-3Galb1-4Glcb-Sp8	25
63	Fuca1-2Galb1-3GlcNAcb-Sp0	24
64	Fuca1-2Galb1-3GlcNAcb-Sp8	4
65	Fuca1-2Galb1-4(Fuca1-3)GlcNAcb1-3Galb1-4(Fuca1-3)GlcNAcb-Sp0	21
66	Fuca1-2Galb1-4(Fuca1-3)GlcNAcb1-3Galb1-4(Fuca1-3)GlcNAcb1-3Galb1-4(Fuca1-3)GlcNAcb-Sp0	19
67	Fuca1-2Galb1-4(Fuca1-3)GlcNAcb-Sp0	13
68	Fuca1-2Galb1-4(Fuca1-3)GlcNAcb-Sp8	19
69	Fuca1-2Galb1-4GlcNAcb1-3Galb1-4GlcNAcb-Sp0	22
70	Fuca1-2Galb1-4GlcNAcb1-3Galb1-4GlcNAcb1-3Galb1-4GlcNAcb-Sp0	45
71	Fuca1-2Galb1-4GlcNAcb-Sp0	12
72	Fuca1-2Galb1-4GlcNAcb-Sp8	16
73	Fuca1-2Galb1-4Glcb-Sp0	24
74	Fuca1-2Galb-Sp8	31
75	Fuca1-3GlcNAcb-Sp8	12
76	Fuca1-4GlcNAcb-Sp8	10
77	Fucb1-3GlcNAcb-Sp8	2
78	GalNAca1-3(Fuca1-2)Galb1-3GlcNAcb-Sp0	25
79	GalNAca1-3(Fuca1-2)Galb1-4(Fuca1-3)GlcNAcb-Sp0	38
80	GalNAca1-3(Fuca1-2)Galb1-4GlcNAcb-Sp0	23
81	GalNAca1-3(Fuca1-2)Galb1-4GlcNAcb-Sp8	23
82	GalNAca1-3(Fuca1-2)Galb1-4Glcb-Sp0	36
83	GalNAca1-3(Fuca1-2)Galb-Sp8	23
84	GalNAca1-3GalNAcb-Sp8	25
85	GalNAca1-3Galb-Sp8	23
86	GalNAca1-4(Fuca1-2)Galb1-4GlcNAcb-Sp8	26
87	GalNAcb1-3GalNAca-Sp8	-2
88	GalNAcb1-3(Fuca1-2)Galb-Sp8	11
89	GalNAcb1-3Gala1-4Galb1-4GlcNAcb-Sp0	17
90	GalNAcb1-4(Fuca1-3)GlcNAcb-Sp0	19
91	GalNAcb1-4GlcNAcb-Sp0	32
92	GalNAcb1-4GlcNAcb-Sp8	4
93	Gala1-2Galb-Sp8	30

94	Gala1-3(Fuca1-2)Galb1-3GlcNAcb-Sp0	15
95	Gala1-3(Fuca1-2)Galb1-4(Fuca1-3)GlcNAcb-Sp0	38
96	Gala1-3(Fuca1-2)Galb1-4GlcNAc-Sp0	21
97	Gala1-3(Fuca1-2)Galb1-4Glcb-Sp0	7
98	Gala1-3(Fuca1-2)Galb-Sp8	15
99	Gala1-3(Gala1-4)Galb1-4GlcNAcb-Sp8	38
100	Gala1-3GalNAca-Sp8	16
101	Gala1-3GalNAcb-Sp8	21
102	Gala1-3Galb1-4(Fuca1-3)GlcNAcb-Sp8	25
103	Gala1-3Galb1-3GlcNAcb-Sp0	20
104	Gala1-3Galb1-4GlcNAcb-Sp8	37
105	Gala1-3Galb1-4Glcb-Sp0	3
106	Gala1-3Galb-Sp8	81
107	Gala1-4(Fuca1-2)Galb1-4GlcNAcb-Sp8	14
108	Gala1-4Galb1-4GlcNAcb-Sp0	9
109	Gala1-4Galb1-4GlcNAcb-Sp8	38
110	Gala1-4Galb1-4Glcb-Sp0	20
111	Gala1-4GlcNAcb-Sp8	22
112	Gala1-6Glcb-Sp8	34
113	Galb1-2Galb-Sp8	19
114	Galb1-3(Fuca1-4)GlcNAcb1-3Galb1-4(Fuca1-3)GlcNAcb-Sp0	35
115	Galb1-3(Fuca1-4)GlcNAcb1-3Galb1-4GlcNAcb-Sp0	2
116	Galb1-3(Fuca1-4)GlcNAcb-Sp0	9
117	Galb1-3(Fuca1-4)GlcNAc-Sp8	33
118	Galb1-3(Fuca1-4)GlcNAcb-Sp8	34
119	Galb1-3(Galb1-4GlcNAcb1-6)GalNAca-Sp8	23
120	Galb1-3(GlcNAcb1-6)GalNAca-Sp8	25
121	Galb1-3(Neu5Aca2-6)GalNAca-Sp8	48
122	Galb1-3(Neu5Acb2-6)GalNAca-Sp8	32
123	Galb1-3(Neu5Aca2-6)GlcNAcb1-4Galb1-4Glcb-Sp10	6
124	Galb1-3GalNAca-Sp8	9
125	Galb1-3GalNAcb-Sp8	13

126	Galb1-3GalNAcb1-3Gala1-4Galb1-4Glcb-Sp0	-2
127	Galb1-3GalNAcb1-4(Neu5Aca2-3)Galb1-4Glcb-Sp0	27
128	Galb1-3GalNAcb1-4Galb1-4Glcb-Sp8	15
129	Galb1-3Galb-Sp8	11
130	Galb1-3GlcNAcb1-3Galb1-4GlcNAcb-Sp0	19
131	Galb1-3GlcNAcb1-3Galb1-4Glcb-Sp10	16
132	Galb1-3GlcNAcb-Sp0	30
133	Galb1-3GlcNAcb-Sp8	18
134	Galb1-4(Fuca1-3)GlcNAcb-Sp0	14
135	Galb1-4(Fuca1-3)GlcNAcb-Sp8	4
136	Galb1-4(Fuca1-3)GlcNAcb1-4Galb1-4(Fuca1-3)GlcNAcb-Sp0	55
137	Galb1-4(Fuca1-3)GlcNAcb1-4Galb1-4(Fuca1-3)GlcNAcb1-4Galb1-4(Fuca1-3)GlcNAcb-Sp0	15
138	Galb1-4[6OSO3]Glcb-Sp0	1
139	Galb1-4[6OSO3]Glcb-Sp8	22
140	Galb1-4GalNAca1-3(Fuca1-2)Galb1-4GlcNAcb-Sp8	29
141	Galb1-4GalNAcb1-3(Fuca1-2)Galb1-4GlcNAcb-Sp8	40
142	Neu5Aca2-3Galb1-4GlcNAcb1-2Mana1-3(Neu5Aca2-3Galb1-4GlcNAcb1-2Mana1-6)Manb1-4GlcNAcb1-4GlcNAcb-Sp12	25
143	Galb1-4GlcNAcb1-3GalNAca-Sp8	1
144	Galb1-4GlcNAcb1-3Galb1-4(Fuca1-3)GlcNAcb1-3Galb1-4(Fuca1-3)GlcNAcb-Sp0	22
145	Galb1-4GlcNAcb1-3Galb1-4GlcNAcb1-3Galb1-4GlcNAcb-Sp0	32
146	Galb1-4GlcNAcb1-3Galb1-4GlcNAcb-Sp0	30
147	Galb1-4GlcNAcb1-3Galb1-4Glcb-Sp0	11
148	Galb1-4GlcNAcb1-3Galb1-4Glcb-Sp8	15
149	Galb1-4GlcNAcb1-6(Galb1-3)GalNAca-Sp8	12
150	Galb1-4GlcNAcb1-6GalNAca-Sp8	69
151	Galb1-4GlcNAcb-Sp0	14
152	Galb1-4GlcNAcb-Sp8	21
153	Galb1-4Glcb-Sp0	20
154	Galb1-4Glcb-Sp8	30
155	GlcNAca1-3Galb1-4GlcNAcb-Sp8	16
156	GlcNAca1-6Galb1-4GlcNAcb-Sp8	47
157	GlcNAcb1-2Galb1-3GalNAca-Sp8	13

158	GlcNAcb1-3(GlcNAcb1-6)GalNAca-Sp8	-2
159	GlcNAcb1-3(GlcNAcb1-6)Galb1-4GlcNAcb-Sp8	9
160	GlcNAcb1-3GalNAca-Sp8	11
161	GlcNAcb1-3Galb-Sp8	18
162	GlcNAcb1-3Galb1-3GalNAca-Sp8	59
163	GlcNAcb1-3Galb1-4GlcNAcb-Sp0	36
164	GlcNAcb1-3Galb1-4GlcNAcb-Sp8	24
165	GlcNAcb1-3Galb1-4GlcNAcb1-3Galb1-4GlcNAcb-Sp0	-10
166	GlcNAcb1-3Galb1-4Glcb-Sp0	38
167	GlcNAcb1-4-MDPLys	8
168	GlcNAcb1-4(GlcNAcb1-6)GalNAca-Sp8	20
169	GlcNAcb1-4Galb1-4GlcNAcb-Sp8	19
170	(GlcNAcb1-4)6b-Sp8	11
171	(GlcNAcb1-4)5b-Sp8	19
172	GlcNAcb1-4GlcNAcb1-4GlcNAcb-Sp8	21
173	GlcNAcb1-6(Galb1-3)GalNAca-Sp8	11
174	GlcNAcb1-6GalNAca-Sp8	12
175	GlcNAcb1-6Galb1-4GlcNAcb-Sp8	28
176	Glca1-4Glcb-Sp8	15
177	Glca1-4Glca-Sp8	10
178	Glca1-6Glca1-6Glcb-Sp8	24
179	Glcb1-4Glcb-Sp8	9
180	Glcb1-6Glcb-Sp8	22
181	G-ol-Sp8	17
182	GlcAa-Sp8	26
183	GlcAb-Sp8	28
184	GlcAb1-3Galb-Sp8	8
185	GlcAb1-6Galb-Sp8	7
186	KDNa2-3Galb1-3GlcNAcb-Sp0	43
187	KDNa2-3Galb1-4GlcNAcb-Sp0	13
188	Mana1-2Mana1-2Mana1-3Mana-Sp9	16
189	Mana1-2Mana1-3(Mana1-2Mana1-6)Mana-Sp9	20

190	Mana1-2Mana1-3Mana-Sp9	28
191	Mana1-6(Mana1-2Mana1-3)Mana1-6(Mana1-2Mana1-3)Manb1-4GlcNAcb1-4GlcNAcb-Sp12	13
192	Mana1-2Mana1-6(Mana1-3)Mana1-6(Mana1-2Mana1-2Mana1-3)Manb1-4GlcNAcb1-4GlcNAcb-Sp12	17
193	Mana1-2Mana1-2Mana1-3(Mana1-2Mana1-3(Mana1-2Mana1-6)Mana1-6)Manb1-4GlcNAcb1-4GlcNAcb-Sp12	10
194	Mana1-3(Mana1-6)Mana-Sp9	11
195	Mana1-3(Mana1-2Mana1-2Mana1-6)Mana-Sp9	22
196	Mana1-6(Mana1-3)Mana1-6(Mana1-2Mana1-3)Manb1-4GlcNAcb1-4GlcNAcb-Sp12	7
197	Mana1-6(Mana1-3)Mana1-6(Mana1-3)Manb1-4GlcNAcb1-4 GlcNAcb-Sp12	44
198	Neu5Aca2-6Galb1-4GlcNAcb1-2Mana1-3(Neu5Aca2-3Galb1-4GlcNAcb1-2Mana1-6)Manb1-4GlcNAcb1-4GlcNAcb-Sp12	36
199	Manb1-4GlcNAcb-Sp0	52
200	Fuca1-3(Galb1-4)GlcNAcb1-2Mana1-3(Fuca1-3(Galb1-4)GlcNAcb1-2Mana1-6)Manb1-4GlcNAcb1-4GlcNAcb-Sp20	4
201	Neu5Aca2-3Galb1-3GalNAca-Sp8	11
202	Neu5Aca2-8Neu5Aca2-8Neu5Aca2-8Neu5Aca2-3(GalNAcb1-4)Galb1-4Glcb-Sp0	52
203	Neu5Aca2-8Neu5Aca2-8Neu5Aca2-3(GalNAcb1-4)Galb1-4Glcb-Sp0	31
204	Neu5Aca2-8Neu5Aca2-8Neu5Aca2-3Galb1-4Glcb-Sp0	18
205	Neu5Aca2-8Neu5Aca2-3(GalNAcb1-4)Galb1-4Glcb-Sp0	8
206	Neu5Aca2-8Neu5Aca2-8Neu5Aca-Sp8	11
207	Neu5Aca2-3(6-O-Su)Galb1-4(Fuca1-3)GlcNAcb-Sp8	71
208	Neu5Aca2-3(GalNAcb1-4)Galb1-4GlcNAcb-Sp0	35
209	Neu5Aca2-3(GalNAcb1-4)Galb1-4GlcNAcb-Sp8	16
210	Neu5Aca2-3(GalNAcb1-4)Galb1-4Glcb-Sp0	10
211	Neu5Aca2-3(Neu5Aca2-3Galb1-3GalNAcb1-4)Galb1-4Glcb-Sp0	22
212	Neu5Aca2-3(Neu5Aca2-6)GalNAca-Sp8	16
213	Neu5Aca2-3GalNAca-Sp8	16
214	Neu5Aca2-3GalNAcb1-4GlcNAcb-Sp0	21
215	Neu5Aca2-3Galb1-3[6OSO3]GlcNAc-Sp8	15
216	Neu5Aca2-3Galb1-3(Fuca1-4)GlcNAcb-Sp8	18
217	Neu5Aca2-3Galb1-3(Fuca1-4)GlcNAcb1-3Galb1-4(Fuca1-3)GlcNAcb-Sp0	44
218	Neu5Aca2-3Galb1-3(Neu5Aca2-3Galb1-4)GlcNAcb-Sp8	15
219	Neu5Aca2-3Galb1-3[6OSO3]GalNAca-Sp8	12
220	Neu5Aca2-3Galb1-3(Neu5Aca2-6)GalNAca-Sp8	44
221	Neu5Aca2-3Galb-Sp8	19

222	Neu5Aca2-3Galb1-3GalNAcb1-3Gala1-4Galb1-4Glcb-Sp0	14
223	Neu5Aca2-3Galb1-3GlcNAcb1-3Galb1-4GlcNAcb-Sp0	32
224	Neu5Aca2-3Galb1-3GlcNAcb-Sp0	14
225	Neu5Aca2-3Galb1-3GlcNAcb-Sp8	25
226	Neu5Aca2-3Galb1-4[6OSO3]GlcNAcb-Sp8	27
227	Neu5Aca2-3Galb1-4(Fuca1-3)[6OSO3]GlcNAcb-Sp8	9
228	Neu5Aca2-3Galb1-4(Fuca1-3)GlcNAcb1-3Galb1-4(Fuca1-3)GlcNAcb1-3Galb1-4(Fuca1-3)GlcNAcb-Sp0	1
229	Neu5Aca2-3Galb1-4(Fuca1-3)GlcNAcb-Sp0	29
230	Neu5Aca2-3Galb1-4(Fuca1-3)GlcNAcb-Sp8	27
231	Neu5Aca2-3Galb1-4(Fuca1-3)GlcNAcb1-3Galb-Sp8	17
232	Neu5Aca2-3Galb1-4(Fuca1-3)GlcNAcb1-3Galb1-4GlcNAcb-Sp8	60
233	Neu5Aca2-3Galb1-4GlcNAcb1-3Galb1-4(Fuca1-3)GlcNAc-Sp0	26
234	Neu5Aca2-3Galb1-4GlcNAcb1-3Galb1-4GlcNAcb1-3Galb1-4GlcNAcb-Sp0	16
235	Neu5Aca2-3Galb1-4GlcNAcb-Sp0	21
236	Neu5Aca2-3Galb1-4GlcNAcb-Sp8	23
237	Neu5Aca2-3Galb1-4GlcNAcb1-3Galb1-4GlcNAcb-Sp0	10
238	Neu5Aca2-3Galb1-4Glcb-Sp0	9
239	Neu5Aca2-3Galb1-4Glcb-Sp8	8
240	Neu5Aca2-6GalNAca-Sp8	7
241	Neu5Aca2-6GalNAcb1-4GlcNAcb-Sp0	10
242	Neu5Aca2-6Galb1-4[6OSO3]GlcNAcb-Sp8	27
243	Neu5Aca2-6Galb1-4GlcNAcb-Sp0	33
244	Neu5Aca2-6Galb1-4GlcNAcb-Sp8	4
245	Neu5Aca2-6Galb1-4GlcNAcb1-3Galb1-4(Fuca1-3)GlcNAcb1-3Galb1-4(Fuca1-3)GlcNAcb-Sp0	15
246	Neu5Aca2-6Galb1-4GlcNAcb1-3Galb1-4GlcNAcb-Sp0	21
247	Neu5Aca2-6Galb1-4Glcb-Sp0	18
248	Neu5Aca2-6Galb1-4Glcb-Sp8	22
249	Neu5Aca2-6Galb-Sp8	28
250	Neu5Aca2-8Neu5Aca-Sp8	26
251	Neu5Aca2-8Neu5Aca2-3Galb1-4Glcb-Sp0	16
252	Neu5Acb2-6GalNAca-Sp8	22
253	Neu5Acb2-6Galb1-4GlcNAcb-Sp8	11

254	Neu5Gca2-3Galb1-3(Fuca1-4)GlcNAcb-Sp0	14
255	Neu5Gca2-3Galb1-3GlcNAcb-Sp0	16
256	Neu5Gca2-3Galb1-4(Fuca1-3)GlcNAcb-Sp0	31
257	Neu5Gca2-3Galb1-4GlcNAcb-Sp0	30
258	Neu5Gca2-3Galb1-4Glcb-Sp0	9
259	Neu5Gca2-6GalNAca-Sp0	8
260	Neu5Gca2-6Galb1-4GlcNAcb-Sp0	37
261	Neu5Gca-Sp8	106
262	[3OSO3]Galb1-4(Fuca1-3)[6OSO3]Glc-Sp0	35
263	[3OSO3]Galb1-4(Fuca1-3)Glc-Sp0	17
264	[3OSO3]Galb1-4(Fuca1-3)[6OSO3]GlcNAc-Sp8	27
265	[3OSO3]Galb1-4(Fuca1-3)GlcNAc-Sp0	20
266	Fuca1-2[6OSO3]Galb1-4GlcNAc-Sp0	47
267	Fuca1-2Galb1-4[6OSO3]GlcNAc-Sp8	19
268	Fuca1-2[6OSO3]Galb1-4[6OSO3]Glc-Sp0	-1
269	Fuca1-2[6OSO3]Galb1-4Glc-Sp0	34
270	Fuca1-2Galb1-4[6OSO3]Glc-Sp0	25
271	Galb1-3(Fuca1-4)GlcNAcb1-3Galb1-3(Fuca1-4)GlcNAcb-Sp0	22
272	Galb1-3(Galb1-4GlcNacb1-6)GalNAc-Sp14	12
273	Galb1-3(GlcNacb1-6)GalNAc-Sp14	19
274	Galb1-3(Neu5Aca2-3Galb1-4GlcNacb1-6)GalNAca-Sp14	7
275	Galb1-3GalNAca-Sp14	19
276	Galb1-3GlcNAcb1-3Galb1-3GlcNAcb-Sp0	27
277	Galb1-4(Fuca1-3)[6OSO3]GlcNAc-Sp0	58
278	Galb1-4(Fuca1-3)[6OSO3]Glc-Sp0	19
279	Galb1-4(Fuca1-3)GlcNAcb1-3Galb1-3(Fuca1-4)GlcNAcb-Sp0	10
280	Galb1-4GlcNAcb1-3Galb1-3GlcNAcb-Sp0	60
281	Neu5Aca2-3Galb1-3GlcNAcb1-3Galb1-3GlcNAcb-Sp0	27
282	Neu5Aca2-3Galb1-4GlcNAcb1-3Galb1-3GlcNAcb-Sp0	23
283	[3OSO3]Galb1-4[6OSO3]GlcNAcb-Sp0	11
284	[3OSO3][4OSO3]Galb1-4GlcNAcb-Sp0	7
285	[6OSO3]Galb1-4[6OSO3]GlcNAcb-Sp0	39

286	6-H2PO3Glcb-Sp10	15
287	Gala1-3(Fuca1-2)Galb-Sp18	21
288	Gala1-3GalNAca-Sp16	5
289	Galb1-3GalNAca-Sp16	17
290	Galb1-3(Neu5Aca2-3Galb1-4(Fuca1-3)GlcNAcb1-6)GalNAca-Sp14	64
291	Galb1-3Galb1-4GlcNAcb-Sp8	34
292	Galb1-4GlcNAcb1-2Mana1-3(Neu5Aca2-6Galb1-4GlcNAcb1-2Mana1-6)Manb1-4GlcNAcb1-4GlcNAcb-Sp12	35
293	Galb1-4GlcNAcb1-3(Galb1-4GlcNAcb1-6)Galb1-4GlcNAc-Sp0	18
294	Galb1-4GlcNAcb1-3(GlcNAcb1-6)Galb1-4GlcNAc-Sp0	23
295	Galb1-4GlcNAca1-6Galb1-4GlcNAcb-Sp0	33
296	Galb1-4GlcNAcb1-6Galb1-4GlcNAcb-Sp0	37
297	GalNAca1-3(Fuca1-2)Galb-Sp18	24
298	GalNAca-Sp15	12
299	GalNAcb1-3Galb-Sp8	40
300	GlcAb1-3GlcNAcb-Sp8	16
301	GlcNAcb1-2Mana1-3(Neu5Aca2-6Galb1-4GlcNAcb1-2Mana1-6)Manb1-4GlcNAcb1-4GlcNAcb-Sp12	21
302	GlcNAcb1-2Mana1-3(GlcNAcb1-2Mana1-6)Manb1-4GlcNAcb1-4GlcNAcb-Sp12	7
303	GlcNAcb1-3Man-Sp10	21
304	GlcNAcb1-4GlcNAcb-Sp10	3
305	GlcNAcb1-4GlcNAcb-Sp12	21
306	HOOC(CH3)CH-3-O-GlcNAcb1-4GlcNAcb-Sp10	0
307	Mana1-3(Mana1-6)Manb1-4GlcNAcb1-4GlcNAcb-Sp12	28
308	Mana1-6Manb-Sp10	21
309	Mana1-6(Mana1-3)Mana1-6(Mana1-3)Manb-Sp10	14
310	Mana1-2Mana1-2Mana1-3(Mana1-2Mana1-6(Mana1-3)Mana1-6)Mana-Sp9	15
311	Mana1-2Mana1-2Mana1-3(Mana1-2Mana1-6(Mana1-2Mana1-3)Mana1-6)Mana-Sp9	35
312	Neu5Aca2-3Galb1-3(Neu5Aca2-3Galb1-4GlcNAcb1-6)GalNAca-Sp14	25
313	Neu5Aca2-3Galb1-3(Neu5Aca2-6)GalNAca-Sp14	49
314	Neu5Aca2-3Galb1-3GalNAca-Sp14	36
315	Neu5Aca2-3Galb1-4GlcNAcb1-2Mana1-3(Neu5Aca2-6Galb1-4GlcNAcb1-2Mana1-6)Manb1-4GlcNAcb1-4GlcNAcb-Sp12	38
316	Neu5Aca2-6Galb1-4GlcNAcb1-2Mana1-3(Galb1-4GlcNAcb1-2Mana1-6)Manb1-4GlcNAcb1-4GlcNAcb-Sp12	38
317	Neu5Aca2-6Galb1-4GlcNAcb1-2Mana1-3(GlcNAcb1-2Mana1-6)Manb1-4GlcNAcb1-4GlcNAcb-Sp12	20

318	Neu5Aca2-6Galb1-4GlcNAcb1-2Mana1-3(Neu5Aca2-6Galb1-4GlcNAcb1-2Mana1-6)Manb1-4GlcNAcb1-4GlcNAcb-N(LT)AVL	98
319	Fuca1-2Galb1-3GalNAca-Sp14	7
320	Galb1-3(Neu5Aca2-6)GalNAca-Sp14	13
321	Galb1-4GlcNAcb1-3GalNAc-Sp14	21
322	Neu5Ac(9Ac)a2-3Galb1-4GlcNAcb-Sp0	30
323	Neu5Ac(9Ac)a2-3Galb1-3GlcNAcb-Sp0	20
324	Neu5Aca2-6Galb1-4GlcNAcb1-3Galb1-3GlcNAcb-Sp0	46
325	Neu5Aca2-3Galb1-3(Fuca1-4)GlcNAcb1-3Galb1-3(Fuca1-4)GlcNAcb-Sp0	14
326	Neu5Aca2-6Galb1-4GlcNAcb1-3Galb1-4GlcNAcb1-3Galb1-4GlcNAcb-Sp0	20
327	Gala1-4Galb1-4GlcNAcb1-3Galb1-4Glcb-Sp0	15
328	GalNAcb1-3Gala1-4Galb1-4GlcNAcb1-3Galb1-4Glcb-Sp0	13
329	GalNAca1-3(Fuca1-2)Galb1-4GlcNAcb1-3Galb1-4GlcNAcb-Sp0	63
330	GalNAca1-3(Fuca1-2)Galb1-4GlcNAcb1-3Galb1-4GlcNAcb1-3Galb1-4GlcNAcb-Sp0	13
331	(Neu5Aca2-3-Galb1-3)(((Neu5Aca2-3-Galb1-4(Fuca1-3))GlcNAcb1-6)GalNAc-Sp14	31
332	GlcNAca1-4Galb1-4GlcNAcb1-3Galb1-4GlcNAcb1-3Galb1-4GlcNAcb-Sp0	19
333	GlcNAca1-4Galb1-4GlcNAcb-Sp0	21
334	GlcNAca1-4Galb1-3GlcNAcb-Sp0	6
335	GlcNAca1-4Galb1-4GlcNAcb1-3Galb1-4Glcb-Sp0	24
336	GlcNAca1-4Galb1-4GlcNAcb1-3Galb1-4(Fuca1-3)GlcNAcb1-3Galb1-4(Fuca1-3)GlcNAcb-Sp0	118
337	GlcNAca1-4Galb1-4GlcNAcb1-3Galb1-4GlcNAcb-Sp0	21
338	GlcNAca1-4Galb1-3GalNAc-Sp14	26
339	Mana1-3(Neu5Aca2-6Galb1-4GlcNAcb1-2Mana1-6)Manb1-4GlcNAcb1-4GlcNAc-Sp12	34
340	Neu5Aca2-6Galb1-4GlcNAcb1-2Mana1-3(Mana1-6)Manb1-4GlcNAcb1-4GlcNAc-Sp12	19
341	Neu5Aca2-6Galb1-4GlcNAcb1-2Mana1-6Manb1-4GlcNAcb1-4GlcNAc-Sp12	7
342	Neu5Aca2-6Galb1-4GlcNAcb1-2Mana1-3Manb1-4GlcNAcb1-4GlcNAc-Sp12	20
343	Galb1-4GlcNAcb1-2Mana1-3Manb1-4GlcNAcb1-4GlcNAc-Sp12	27
344	Galb1-4GlcNAcb1-2Mana1-6Manb1-4GlcNAcb1-4GlcNAc-Sp12	21
345	Galb1-4GlcNAcb1-2Mana1-3(Mana1-6)Manb1-4GlcNAcb1-4GlcNAcb-Sp12	38
346	GlcNAcb1-2Mana1-3(GlcNAcb1-2Mana1-6)Manb1-4GlcNAcb1-4(Fuca1-6)GlcNAcb-Sp22	32
347	Galb1-4GlcNAcb1-2Mana1-3(Galb1-4GlcNAcb1-2Mana1-6)Manb1-4GlcNAcb1-4(Fuca1-6)GlcNAcb-Sp22	17
348	Galb1-3GlcNAcb1-2Mana1-3(Galb1-3GlcNAcb1-2Mana1-6)Manb1-4GlcNAcb1-4(Fuca1-6)GlcNacb-Sp22	27
349	Galb1-3(Fuca1-4)GlcNAcb1-2Mana1-3(Galb1-3(Fuca1-4)GlcNAcb1-2Mana1-6)Manb1-4GlcNAcb1-4GlcNAcb-Sp19	58

350	[6OSO3]GlcNAcb1-3Gal b1-4GlcNAc-b-Sp0	32
351	KDNa2-3Galb1-4(Fuca1-3)GlcNAc-Sp0	34
352	KDNa2-6Galb1-4GlcNAc-Sp0	23
353	KDNa2-3Galb1-4Glc-Sp0	24
354	KDNa2-3Galb1-3GalNAca-Sp14	63
355	Fuca1-2Galb1-3GlcNAcb1-2Mana1-3(Fuca1-2Galb1-3GlcNAcb1-2Mana1-6)Manb1-4GlcNAcb1-4GlcNAcb-Sp20	29
356	Fuca1-2Galb1-4GlcNAcb1-2Mana1-3(Fuca1-2Galb1-4GlcNAcb1-2Mana1-6)Manb1-4GlcNAcb1-4GlcNAcb-Sp20	21
357	Fuca1-2Galb1-4(Fuca1-3)GlcNAcb1-2Mana1-3(Fuca1-2Galb1-4(Fuca1-3)GlcNAcb1-2Mana1-6)Manb1-4GlcNAcb1-4GlcNAb-Sp20	38
358	Gala1-3Galb1-4GlcNAcb1-2Mana1-3(Gala1-3Galb1-4GlcNAcb1-2Mana1-6)Manb1-4GlcNAcb1-4GlcNAcb-Sp20	76
359	Mana1-3(Galb1-4GlcNAcb1-2Mana1-6)Manb1-4GlcNAcb1-4GlcNAcb-Sp12	25
360	Galb1-3(Fuca1-4)GlcNAcb1-2Mana1-3(Galb1-3(Fuca1-4)GlcNAcb1-2Mana1-6)Manb1-4GlcNAcb1-4(Fuca1-6)GlcNAcb-Sp22	35
361	Neu5Aca2-6GlcNAcb1-4GlcNAc-Sp21	15
362	Neu5Aca2-6GlcNAcb1-4GlcNAcb1-4GlcNAc-Sp21	26
363	Fuca1-2Galb1-3GlcNAcb1-3(Galb1-4(Fuca1-3)GlcNAcb1-6)Galb1-4Glc-Sp21	40
364	Galb1-4GlcNAcb1-2(Galb1-4GlcNAcb1-4)Mana1-3(Galb1-4GlcNAcb1-2Mana1-6)Manb1-4GlcNAcb1-4GlcNAc-Sp21	25
365	GalNAca1-3(Fuca1-2)Galb1-4GlcNAcb1-2Mana1-3(GalNAca1-3(Fuca1-2)Galb1-4GlcNAcb1-2Mana1-6)Manb1-4GlcNAcb1-4GlcNAcb-Sp20	47
366	Gala1-3(Fuca1-2)Galb1-4GlcNAcb1-2Mana1-3(Gala1-3(Fuca1-2)Galb1-4GlcNAcb1-2Mana1-6)Manb1-4GlcNAcb1-4GlcNAcb-Sp20	37
367	Gala1-3Galb1-4(Fuca1-3)GlcNAcb1-2Mana1-3(Gala1-3Galb1-4(Fuca1-3)GlcNAcb1-2Mana1-6)Manb1-4GlcNAcb1-4GlcNAcb-Sp20	26
368	GalNAca1-3(Fuca1-2)Galb1-3GlcNAcb1-2Mana1-3(GalNAca1-3(Fuca1-2)Galb1-3GlcNAcb1-2Mana1-6)Manb1-4GlcNAcb1-4GlcNAcb-Sp20	20
369	Gala1-3(Fuca1-2)Galb1-3GlcNAcb1-2Mana1-3(Gala1-3(Fuca1-2)Galb1-3GlcNAcb1-2Mana1-6)Manb1-4GlcNAcb1-4GlcNAcb-Sp20	21
370	Fuca1-2Galb1-3(Fuca1-4)GlcNAcb1-2Mana1-3(Fuca1-2Galb1-3(Fuca1-4)GlcNAcb1-2Mana1-6)Manb1-4GlcNAcb1-4GlcNAcb-Sp19	41
371	NeuAca2-3Galb1-4GlcNAcb1-3GalNAc-Sp14	30
372	NeuAca2-6Galb1-4GlcNAcb1-3GalNAc-Sp14	25
373	Neu5Aca2-3Galb1-4(Fuca1-3)GlcNAcb1-3GalNAca-Sp14	107
374	GalNAcb1-4GlcNAcb1-2Mana1-6(GalNAcb1-4GlcNAcb1-2Mana1-6)Manb1-4GlcNAcb1-4GlcNAc-Sp12	60
375	Galb1-3GalNAca1-3(Fuca1-2)Galb1-4Glc-Sp14	44
376	Galb1-3GalNAca1-3(Fuca1-2)Galb1-4GlcNAc-Sp14	45
377	GlcNAcb1-3GalNAca-Sp14	24
378	GlcNAcb1-6GalNAca-Sp14	46
379	Galb1-3GlcNacb1-3(Galb1-3GlcNacb1-3Galb1-4GlcNacb1-6)Galb1-4Glcb-Sp0	36
380	Galb1-3GlcNAcb1-3(Galb1-4(Fuca1-3)GlcNAcb1-6)Galb1-4Glc-Sp21	23
381	Fuca1-2Galb1-3(Fuca1-4)GlcNAcb1-3(Galb1-4GlcNAcb1-6)Galb1-4Glc-Sp21	6

382	Fuca1-2Galb1-3(Fuca1-4)GlcNAcb1-3(Galb1-4(Fuca1-3)GlcNAcb1-6)Galb1-4Glc-Sp21	16
383	Galb1-3GlcNAcb1-3(Galb1-3GlcNAcb1-3Galb1-4(Fuca1-3)GlcNAcb1-6)Galb1-4Glc-Sp21	30
384	Galb1-4GlcNacb1-2(Galb1-4GlcNacb1-4)Mana1-3(Galb1-4GlcNacb1-2(Galb1-4GlcNacb1-6)Mana1-6)Manb1-4GlcNacb1-4GlcNacb-Sp21	41
385	GlcNacb1-2(GlcNacb1-4)Mana1-3(GlcNacb1-2Mana1-6)Manb1-4GlcNacb1-4GlcNac-Sp21	18
386	Fuca1-2Galb1-3GalNAca1-3(Fuca1-2)Galb1-4Glcb-Sp0	12
387	Fuca1-2Galb1-3GalNAca1-3(Fuca1-2)Galb1-4GlcNAcb-Sp0	19
388	Galb1-3GlcNAcb1-3GalNAca-Sp14	20
389	Neu5Aca2-3(GalNAcb1-4)Galb1-4GlcNAcb1-3GalNAca-Sp14	12
390	GalNAca1-3(Fuca1-2)Galb1-3GalNAca1-3(Fuca1-2)Galb1-4GlcNAcb-Sp0	33
391	Gala1-3Galb1-3GlcNAcb1-2Mana1-3(Gala1-3Galb1-3GlcNAcb1-2Mana1-6)Manb1-4GlcNAcb1-4GlcNAc-Sp19	36
392	Gala1-3Galb1-3(Fuca1-4)GlcNAcb1-2Mana1-3(Gala1-3Galb1-3(Fuca1-4)GlcNAcb1-2Mana1-6)Manb1-4GlcNAcb1-4GlcNAc-Sp19	15
393	Neu5Aca2-3Galb1-3GlcNAcb1-2Mana1-3(Neu5Aca2-3Galb1-3GlcNAcb1-2Mana1-6)Manb1-4GlcNAcb1-4GlcNAc-Sp19	6
394	Galb1-4GlcNAcb1-2Mana1-3(GlcNAcb1-2Mana1-6)Manb1-4GlcNAcb1-4GlcNAc-Sp12	21
395	GlcNAcb1-2Mana1-3(Galb1-4GlcNAcb1-2Mana1-6)Manb1-4GlcNAcb1-4GlcNAc-Sp12	20
396	Neu5Aca2-3Galb1-3GlcNAcb1-3GalNaca-Sp14	22
397	Fuca1-2Galb1-4GlcNacb1-3GalNaca-Sp14	26
398	Galb1-4(Fuca1-3)GlcNacb1-3GalNaca-Sp14	36
399	GalNaca1-3GalNacb1-3Gala1-4Galb1-4GlcNacb-Sp0	8
400	Gala1-4Galb1-3GlcNacb1-2Mana1-3(Gala1-4Galb1-3GlcNacb1-2Mana1-6)Manb1-4GlcNacb1-4GlcNacb-Sp19	81
401	Gala1-4Galb1-4GlcNacb1-2Mana1-3(Gala1-4Galb1-4GlcNacb1-2Mana1-6)Manb1-4GlcNacb1-4GlcNacb-LVNKT	37
402	Gala1-3Galb1-4GlcNacb1-3GalNaca-Sp14	32
403	Galb1-3GlcNAcb1-6Galb1-4GlcNAcb-Sp0	24
404	Galb1-3GlcNAca1-6Galb1-4GlcNAcb-Sp0	12
405	GalNAcb1-3Gala1-6Galb1-4Glcb-Sp8	4
406	GlcNAcb1-6(GlcNAcb1-3)GalNAca-Sp14	15

Supplementary Table 2. Glycan microarray binding studies using the Consortium for Functional Genomics (CFG) microarray

The position of each glycan is indicated and the fluorescence score with CLEC5A as illustrated in Figure 4C. None of the scores are significant. *N*-glycan-related sequences with a variety of spacer arms/linkers* are included among the 406 glycan probes in this CFG array version 3.2 (http://www.functionalglycomics.org/static/consortium/resources/resourcecoreh12.shtml).

*Spacers (Sp):Sp0, $-CH_2CH_2NH_2$; Sp8, $-CH_2-CH_2-CH_2-NH_2$; Sp9, $-CH_2CH_2CH_2CH_2CH_2NH_2$; Sp10, $-NHCOCH_2NH$; Sp11, $-OCH_2C_6H_4$-p-$NHCOCH_2NH$; Sp12, Asparagine; Sp13, Glycine; Sp14, Threonine; Sp15, Serine; Sp16, $-PNP(OC_6H_4NH_2)$; Sp17, $-OCH_2C_6H_4NH_2$; Sp18, $-O(CH_2)_3NHCO(CH_2)_5NH_2$; Sp19, EN (Glutamate, Asparagine) or NK (Asparagine, Lysine); Sp20, GENR (Glycine, Glutamate, Asparagine, Arginine); Sp21, $-N(CH_3)-O-(CH_2)_2-NH_2$; Sp22, NST (*N*-glycosylation consensus site: Asparagine, Serine, Threonine). Other linkers: MDPLys,

Mur-L-Ala-D-iGlnβ-$(CH_2)_4NH_2$; N(LT)AVL, Asparagine(Leucine, Threonine), Alanine, Valine, Leucine; LVNKT, Leucine, Valine, Asparagine, Lysine, Threonine.

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