

Supplementary Material

Repertoire of BALB/c mice natural anti-carbohydrate antibodies: mice vs. humans difference, and otherness of individual animals

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Table S1. List of glycans, their binding to natural circulating antibodies (IgM+IgG) of BALB/c mice (n=20), expressed in relative fluorescence units (RFU) as median \pm median absolute deviation (MAD), and the number of animals exceeding *cut off* (≥ 4000 RFU).

Glycan ID (#)	Structure	Common Name	Median and MAD as RFU		Animals showing RFU ≥ 4000
			Median	MAD	
001	Fuc α -sp3		1590	342	1
002	Gal α -sp3		1522	316	0
003	Gal β -sp3		11858	1420	12
004	GalNAc α 1-OSer	T _n Ser	2145	395	2
005	GalNAc α -sp3	T _n	1642	192	2
006	GalNAc β -sp3		1001	250	0
007	Glc α -sp3		1242	222	0
009	Glc β -sp3		1576	325	0
010	GlcNAc β -sp3		4124	471	1
011	GlcNAc β -sp2		4634	607	2
012	GlcNAc β -sp7		2068	523	2
013	GlcNAc β -sp8		7267	1117	9
014	GlcN(Gc) β -sp4		914	203	0
015	HOCH ₂ (HOCH) ₄ CH ₂ NH ₂	aminoglucitol	1374	316	0
016	Man α -sp3		1164	263	0
017	Man α -sp4		1567	369	0
018	Man β -sp4		1842	319	2
019	ManNAc β -sp4		4752	390	4
020	Rha α -sp3		970	308	0

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021	Gal β -sp4		1338	269	0
022	GlcNAc β -sp4		932	230	0
023	GalNAc β -sp4		1246	271	0
024	GlcNAc α -sp3		1463	260	2
025	GalNAc β -sp10		848	209	0
026	Rha β -sp4		1098	227	0
027	3,6-Me2Glc	DMG	673	123	0
028	Xyl β -sp4		1411	302	0
029	Fuc β -sp4		1139	301	0
030	Glc β -sp4		1449	429	1
031	L-Ara α -sp4		1099	369	0
032	GalNGc β -sp3		483	119	0
037	3-O-Su-Gal β -sp3		2317	503	3
038	3-O-Su-GalNAc β -sp3		3657	689	7
041	6-O-Su-GalNAc α -sp3		5504	1443	7
043	6-O-Su-GlcNAc β -sp3		1040	253	1
044	GlcA α -sp3	α -glucuronic acid	1275	327	0
045	GlcA β -sp3	β -glucuronic acid	1671	335	1
046	6-H ₂ PO ₃ Glc β -sp4	β -Glc6P	1369	316	0
047	6-H ₂ PO ₃ Man α -sp3	α -Man6P	1300	322	0
048	Neu5Ac α -sp3		583	131	0
049	Neu5Ac α -sp9		1349	334	3
050	Neu5Ac β -sp3		2184	526	3
051	Neu5Ac β -sp9		1698	609	3
052	Neu5Gc α -sp3		847	286	0
053	Neu5Gc β -sp3		1202	307	0
054	9-NAc-Neu5Ac α -sp3		256	77	0
055	3-O-Su-GlcNAc β -sp3		840	214	0
056	Gal α -sp7		1016	263	0
057	Rib -sp4		1153	248	0
058	Fuc β -sp3		2266	422	1
059	Crypted	Crypted	1360	389	0
060	6-O-Su-Gal β -sp3		61113	1156	20
061	3-OSu-GalNAc α -sp3		2692	622	3
071	Fuc α 1-2Gal β -sp3	H _{di}	1077	245	1
072	Fuc α 1-3GlcNAc β -sp3		1424	300	2

073	Fuc α 1-4GlcNAc β -sp3	Le	755	217	0
074	Fuc β 1-3GlcNAc β -sp3		533	130	0
075	Gal α 1-2Gal β -sp3		790	184	0
076	Gal α 1-3Gal β -sp3	B _{di}	775	192	0
077	Gal α 1-3GalNAc β -sp3	T _{$\alpha\beta$}	668	155	0
078	Gal α 1-3GalNAc α -sp3	T _{$\alpha\alpha$}	581	113	0
080	Gal α 1-3GlcNAc β -sp3		384	76	0
081	Gal α 1-4GlcNAc β -sp3	α -LN	815	183	1
082	Gal α 1-4GlcNAc β -sp8	α -LN	713	144	1
083	Gal α 1-6Glc β -sp4	melibiose	2285	348	2
084	Gal β 1-2Gal β -sp3		1332	301	1
086	Gal β 1-3GlcNAc β -sp2	Le ^C	609	130	0
087	Gal β 1-3Gal β -sp3		1488	282	1
088	Gal β 1-3GalNAc β -sp3	T _{$\beta\beta$}	1468	174	2
089	Gal β 1-3GalNAc α -sp3	TF	297	59	0
092	Gal β 1-4Glc β -sp2	Lactose, Lac	889	182	0
093	Gal β 1-4Glc β -sp4	Lactose, Lac	1089	290	0
094	Gal β 1-4Gal β -sp4		1124	278	0
096	Gal β 1-4GlcNAc β -sp2	N-acetyllactosamine, LN	2604	893	1
097	Gal β 1-4GlcNAc β -sp3	N-acetyllactosamine, LN	491	103	0
098	Gal β 1-4GlcNAc β -sp5	N-acetyllactosamine, LN	341	65	0
099	Gal β 1-4GlcNAc β -sp8	N-acetyllactosamine, LN	357	65	1
100	Gal β 1-6Gal β -sp4		18406	2396	15
101	GalNAc α 1-3GalNAc β -sp3	Fs-2	1158	307	1
102	GalNAc α 1-3Gal β -sp3	A _{di}	1199	295	1
103	GalNAc α 1-3GalNAc α -sp3	core 5	451	87	0
104	GalNAc β 1-3Gal β -sp3		603	144	0
105	GalNAc β 1-3GalNAc β -sp3	para-Fs	5975	1065	11
106	GalNAc β 1-4GlcNAc β -sp3	LacdiNAc	332	79	0
107	GalNAc β 1-4GlcNAc β -sp2	LacdiNAc	390	95	0
110	Glc α 1-4Glc β -sp3	maltose	10870	2172	10
111	Glc β 1-4Glc β -sp4	cellobiose	3363	407	3
112	Glc β 1-6Glc β -sp4	gentiobiose	6968	1229	5
113	GlcNAc β 1-3GalNAc α -sp3	core 3	4852	620	3
114	GlcNAc β 1-3Man β -sp4		1474	423	2
115	GlcNAc β 1-4GlcNAc β -Asn	chitobiose-Asn	12575	2669	14
116	GlcNAc β 1-4GlcNAc β -sp3	chitobiose	1040	186	1

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117	GlcNAc β 1-4GlcNAc β -sp4	chitobiose	8585	1418	11
118	GlcNAc β 1-6GalNAc α -sp3	core 6	7860	714	4
119	Man α 1-2Man β -sp4		1200	259	0
120	Man α 1-3Man β -sp4		1224	338	0
121	Man α 1-4Man β -sp4		1064	328	0
122	Man α 1-6Man β -sp4		1484	380	0
123	Man β 1-4GlcNAc β -sp4		2103	428	2
125	6-Bn-Gal β 1-4GlcNAc β -sp2		32674	5389	19
126	6-Bn-Gal α 1-4(6-Bn)GlcNAc β -sp3		15410	3185	15
127	Gal β 1-4Glc β -dipeptide		559	105	0
128	Gal β 1-4Glc β -dipeptide		1181	263	0
129	Gal β 1-3(6-O-Bn)GlcNAc β -sp3		683	184	0
130	(6-O-Bn-Gal β 1)-3GlcNAc β -sp3		378	104	0
131	(6-O-Bn-Gal β 1)-3(6-O-Bn)GlcNAc β -sp3		1908	494	2
132	Gal β 1-3GalNAc α -sp5	TF	376	72	0
133	Gal β 1-4Glc β -dipeptide		6816	465	4
134	Gal β 1-4Glc β -dipeptide		1197	271	0
135	Gal β 1-4Glc β -dipeptide		941	330	0
136	Gal β 1-4Glc β -dipeptide		476	98	0
137	Gal β 1-4Glc β -dipeptide		589	88	0
138	Gal β 1-4Glc β -dipeptide		571	130	0
139	Gal β 1-4Glc α -sp3		395	65	0
140	Gal α 1-3GalNAc(fur) β -sp3		608	117	0
142	GlcNAc α 1-3GalNAc β -sp3		4523	1339	4
143	Fuc α 1-2(3-O-Su)Gal β -sp3		468	138	0
144	Gal β 1-3(6-O-Su)GlcNAc β -sp2		297	73	0
145	Gal β 1-3(6-O-Su)GlcNAc β -sp3		388	76	0
146	Gal β 1-4(6-O-Su)Glc β -sp2		2044	469	2
149	GlcNAc β 1-4(6-O-Su)GlcNAc β -sp2		2569	475	5
150	3-O-Su-Gal β 1-3GalNAc α -sp3		37943	3232	20
151	6-O-Su-Gal β 1-3GalNAc α -sp3		1840	250	2
152	3-O-Su-Gal β 1-4Glc β -sp2	SM3	2564	413	2
153	6-O-Su-Gal β 1-4Glc β -sp2		1796	504	2
154	3-O-Su-Gal β 1-3GlcNAc β -sp3		32651	3954	20
156	3-O-Su-Gal β 1-4GlcNAc β -sp2		2305	458	1
158	4-O-Su-Gal β 1-4GlcNAc β -sp2		2927	860	2

159	4-O-Su-Galβ1-4GlcNAcβ-sp3		1656	736	2
160	6-O-Su-Galβ1-3GlcNAcβ-sp2		346	142	0
161	6-O-Su-Galβ1-3GlcNAcβ-sp3		536	141	0
162	6-O-Su-Galβ1-4GlcNAcβ-sp2		5615	1540	7
164	GlcAβ1-3GlcNAcβ-sp3		979	218	1
165	GlcAβ1-3Galβ-sp3		1035	308	1
166	GlcAβ1-6Galβ-sp3		39105	2993	17
167	GlcNAcβ1-4-[HOOC(CH ₃)CH]-3-O-GlcNAcβ-sp4	GlcNAc-Mur	1012	269	1
168	GlcNAcβ1-4Mur-L-Ala-D-i-Gln-Lys	GMDP-Lys	3668	152	1
169	Neu5Acα2-3Galβ-sp3	GM4	2305	596	3
170	Neu5Acα2-6Galβ-sp3		4157	633	3
171	Neu5Acα2-3GalNAcα-sp3	3-SiaT _n	844	168	1
172	Neu5Acα2-6GalNAcα-sp3	SiaT _n	3250	124	1
173	Neu5Acβ2-6GalNAcα-sp3	b-SiaT _n	3221	855	5
174	Neu5Gcα2-6GalNAcα-sp3	Neu5Gc-T _n	1596	178	1
175	Neu5Gcβ2-6GalNAcα-sp3		1453	451	2
176	3-O-Su-Galβ1-4(6-O-Su)Glcβ-sp2		43008	9342	20
177	3-O-Su-Galβ1-4(6-O-Su)GlcNAcβ-sp3		32496	7215	20
178	6-O-Su-Galβ1-4(6-O-Su)Glcβ-sp2		3506	763	5
179	6-O-Su-Galβ1-3(6-O-Su)GlcNAcβ-sp2		1770	580	0
180	6-O-Su-Galβ1-4(6-O-Su)GlcNAcβ-sp2		2991	832	4
181	3,4-O-Su ₂ -Galβ1-4GlcNAcβ-sp3		2993	820	5
182	3,6-O-Su ₂ -Galβ1-4GlcNAcβ-sp2		487	151	0
183	4,6-O-Su ₂ -Galβ1-4GlcNAcβ-sp2		4401	944	4
184	4,6-O-Su ₂ -Galβ1-4GlcNAcβ-sp3		1945	649	2
186	Neu5Acα2-8Neu5Acα2-sp3	(Sia) ₂	190	64	0
187	3-O-Su-Galβ1-4(6-O-Su)Glcβ-sp2		290	91	0
188	Neu5Acα2-8Neu5Acβ-sp9		1162	382	2
189	3,6-O-Su ₂ -Galβ1-4(6-O-Su)GlcNAcβ-sp2		2054	543	3
190	Galβ1-4-(6-P)GlcNAcβ-sp2		1217	347	1
191	6-P-Galβ1-4GlcNAcβ-sp2		926	194	1
192	GalNAcβ1-4(6-O-Su)GlcNAcβ-sp3		483	106	0
193	3-O-Su-GalNAcβ1-4GlcNAcβ-sp3		3103	626	4
194	6-O-Su-GalNAcβ1-4GlcNAcβ-sp3		2884	455	4
195	6-O-Su-GalNAcβ1-4-(3-O-Ac)GlcNAcβ-sp3		589	122	0
196	3-O-Su-GalNAcβ1-4(3-O-Su)-GlcNAcβ-sp3		605	123	1
197	3,6-O-Su ₂ -GalNAcβ1-4-GlcNAcβ-sp3		287	54	0

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198	4,6-O-Su ₂ -GalNAcβ1-4GlcNAcβ-sp3		2251	407	1
199	4,6-O-Su ₂ -GalNAcβ1-4-(3-O-Ac)GlcNAcβ-sp3		690	178	0
200	4-O-Su-GalNAcβ1-4GlcNAcβ-sp3		466	134	0
201	3,4-O-Su ₂ -GalNAcβ1-4-GlcNAcβ-sp3		3790	859	6
202	6-O-Su-GalNAcβ1-4(6-O-Su)GlcNAcβ-sp3		4471	933	8
203	Galβ1-4(6-O-Su)GlcNAcβ-sp2		5424	1203	8
204	4-O-Su-GalNAcβ1-4GlcNAcβ-sp2		753	120	1
205	Neu5Acα2-6GalNAcβ-sp3		606	111	1
206	Neu5Gcα2-3Gal-sp3		1295	371	0
207	Neu5Acβ2-6GalNAcβ-sp3		2913	646	3
208	Galβ1-3GlcNAcβ-sp4	Le ^C	658	172	0
209	Crypted	Crypted	6503	1331	9
210	Crypted	Crypted	1743	558	1
211	Crypted	Crypted	8440	1533	13
212	Crypted	Crypted	2129	530	3
213	Neu5Acβ2-6Galβ-sp3		2672	827	3
214	ΔGlcAβ1-3Galβ-sp3	deltaGlcAβ3Gal	589	161	0
215	Fuca1-2Galβ1-3GlcNAcβ-sp3	Le ^d , H (type 1)	2727	444	3
216	Fuca1-2Galβ1-4GlcNAcβ-sp3	H (type 2)	10845	2895	15
217	Fuca1-2Galβ1-3GalNAcα-sp3	H (type 3)	3108	468	6
219	Fuca1-2Galβ1-4Glcβ-sp4	H (type 6)-Gly	8251	1687	10
220	Galα1-3Galβ1-4Glcβ-sp2		901	275	0
221	Galα1-3Galβ1-4Glcβ-sp4		1230	393	2
222	Galα1-3Galβ1-4GlcNAcβ-sp3	Galili (tri)	254	106	0
223	Galα1-4Galβ1-4Glcβ-sp2	P ^k , Gb3, GbOse ₃	756	247	0
225	Galα1-4Galβ1-4GlcNAcβ-sp2	P ₁	573	165	0
226	Galα1-3(Fuca1-2)Galβ-sp3	B _{tri}	1227	312	1
227	Galα1-3(Fuca1-2)Galβ-sp5	B _{tri} -C8	1044	248	1
228	Galβ1-2Galα1-3GlcNAcβ-sp3		321	87	0
229	Galβ1-3Galβ1-4GlcNAcβ-sp4		323	81	0
230	Galβ1-4Galβ1-4Glcβ-sp2	Mc3	248	84	0
232	Galβ1-4GlcNAcβ1-6GalNAcα-sp3		624	81	1
233	Galβ1-3(Fuca1-4)GlcNAcβ-sp3	Le ^A	210	58	0
234	Galβ1-4(Fuca1-3)GlcNAcβ-sp3	Le ^X	13573	2635	16
235	GalNAcα1-3(Fuca1-2)Galβ-sp3	A _{tri}	586	306	1
236	GalNAcα1-3(Fuca1-2)Galβ-sp5	A _{tri}	498	262	1

237	GalNH α 1-3 Gal β -OCH ₂ CH ₂ CH ₂ NHAc Fuc α 1-2		357	135	0
239	GalNAc β 1-3(Fuc α 1-2)Gal β -sp3		849	654	1
240	(Glc α 1-4) ₃ β -sp4	maltotriose	11233	1567	6
241	(Glc α 1-6) ₃ β -sp4	isomaltotriose	520	163	0
242	GlcNAc α 1-3Gal β 1-4GlcNAc β -sp2		278	90	0
243	GlcNAc α 1-3Gal β 1-4GlcNAc β -sp3		215	61	0
245	GlcNAc α 1-6Gal β 1-4GlcNAc β -sp2		3394	1053	3
246	GlcNAc β 1-2Gal β 1-3GalNAc α -sp3		434	94	0
247	GlcNAc β 1-3Gal β 1-3GalNAc α -sp3		321	63	0
248	GlcNAc β 1-3Gal β 1-4Glc β -sp2		822	179	0
249	GlcNAc β 1-3Gal β 1-4GlcNAc β -sp2		1652	322	2
250	GlcNAc β 1-3Gal β 1-4GlcNAc β -sp3		1942	488	2
251	GlcNAc β 1-4Gal β 1-4GlcNAc β -sp2		1067	216	1
252	GlcNAc β 1-4GlcNAc β 1-4GlcNAc β -sp4	chitotriose	1111	206	2
253	GlcNAc β 1-6Gal β 1-4GlcNAc β -sp2		2877	653	3
254	GlcNAc β 1-6(Gal β 1-3)GalNAc α -sp3	core 2	2499	525	4
255	GlcNAc β 1-6(GlcNAc β 1-3)GalNAc α -sp3	core 4	5853	425	4
256	GlcNAc β 1-6(GlcNAc β 1-4)GalNAc α -sp3		5020	613	8
258	Man α 1-6(Man α 1-3)Man β -sp4	Man ₃	743	160	0
259	Gal β 1-4(Gal β 1-3)GlcNAc β -sp3		372	58	0
260	Fuc β 1-4 GlcNAc β -sp3		663	140	0
	Gal β 1-3				
261	Fuc β 1-3 GlcNAc β -sp3		299	62	0
	Gal β 1-4				
262	Gal β 1-3GalNAc β 1-3Gal-sp4		437	120	0
263	(GalNAc β -PEG2) ₃ - β -DD		657	114	0
264	Gal β 1-4Gal β 1-4GlcNAc β -sp3		461	87	0
266	Gal α 1-4Gal β 1-4GlcNAc β -sp3	P ₁	1017	227	0
267	GlcNAc β 1-3Gal β 1-3GlcNAc β -sp3		718	138	0
268	GlcNAc β 1-4(Fuc α 1-6)GlcNAc β -sp3		1291	311	1
269	Gal β 1-3Gal β 1-4Glc β -sp4		518	137	0
270	Gal β 1-4Gal β 1-4Glc β -sp4		939	202	0
271	Gal β 1-6Gal β 1-4Glc β -sp4		53622	1934	20

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272	Neu5Ac α 2-3Gal β 1-4Glc β -sp4-Cit	3'-SL -citrullin	236	60	0
273	Fuc β 1-2Gal β 1-4GlcNAc β -sp3		242	60	0
274	GalNAc α 1-3Gal β 1-4GlcNAc-sp3		426	90	0
275	GalNAc β 1-3Gal β 1-4GlcNAc-sp3		403	103	0
276	GlcNAc β 1-4Gal β 1-4GlcNAc β -sp3		1357	456	2
277	GalNGc α 1-3(Fuc α 1-2)Gal β -sp3	N-Gc-A _{tri}	375	99	0
287	3-O-Su-Gal β 1-3(Fuc α 1-4)GlcNAc β -sp3	3'-OSu-Le ^A	20063	4962	19
288	3-O-Su-Gal β 1-4(Fuc α 1-3)GlcNAc β -sp3	3'-OSu-Le ^X	593	146	0
289	Neu5Ac α 2-6(Gal β 1-3)GalNAc α -sp3		296	88	0
290	Neu5Ac α 2-6(Gal α 1-3)GalNAc α -sp3		262	68	0
291	Neu5Ac β 2-6(Gal β 1-3)GalNAc α -sp3		1887	727	3
292	Neu5Ac α 2-3Gal β 1-3GalNAc α -sp3		4477	1186	4
293	Neu5Ac α 2-3Gal β 1-4Glc β -sp3	3'SL	1684	349	1
294	Neu5Ac α 2-3Gal β 1-4Glc β -sp4	3'SL	363	99	0
295	Neu5Ac α 2-6Gal β 1-4Glc β -sp2	6'SL	290	66	0
296	Neu5Ac α 2-6Gal β 1-4Glc β -sp4	6'SL	360	96	0
297	Neu5Ac β 2-6Gal β 1-4Glc β -sp2		1645	409	3
298	Neu5Ac α 2-3Gal β 1-4GlcNAc β -sp3	3'SLN	5486	1855	3
299	Neu5Ac α 2-3Gal β 1-3GlcNAc β -sp3	3'SiaLe ^C	3968	1266	6
300	Neu5Ac α 2-6Gal β 1-4GlcNAc β -sp3	6'SLN	936	527	1
302	Neu5Ac β 2-6Gal β 1-4GlcNAc β -sp3		1100	368	2
303	Neu5Gc α 2-3Gal β 1-4GlcNAc β -sp3		2147	451	1
304	Neu5Gc α 2-6Gal β 1-4GlcNAc β -sp3		792	191	0
305	Neu5Gc β 2-6Gal β 1-4GlcNAc β -sp3		601	112	0
306	9-Nac-Neu5Ac α 2-6Gal β 1-4GlcNAc β -sp3		1431	437	1
307	KDN α 2-3Gal β 1-3GlcNAc β -sp2		1441	304	2
308	KDN α 2-3Gal β 1-4GlcNAc β -sp2		903	204	0
309	Neu5Ac α 2-6(Neu5Ac α 2-3)GalNAc α -sp3		487	107	1
310	3'SiaLacNAc β -OCH ₂ CH ₂ CH ₂ NH-(3'SiaLacNAc-amide-sp3)		1932	665	1
315	Neu5Ac α 2-3Gal β 1-4-(6-O-Su)GlcNAc β -sp3		1930	477	3
316	Neu5Ac α 2-3Gal β 1-3-(6-O-Su)GlcNAc β -sp3		2752	1014	5
318	Neu5Ac α 2-6Gal β 1-4-(6-O-Su)GlcNAc β -sp3		1004	234	1
319	Neu5Ac α 2-3-(6-O-Su)Gal β 1-4GlcNAc β -sp3		7963	705	7
320	4-O-Su-Neu5Ac α 2-3-(6-O-Su)Gal β 1-4GlcNAc β -sp3		9621	1580	10
321	(Neu5Ac α 2-8) ₃ -sp3	(Sia) ₃	226	57	0

322	(Neu5Ac α 2-8) β 3-sp3		553	112	0
323	Neu5Ac α 2-6Gal β 1-3GlcNAc-sp3	6'-SiaLe ^c	317	100	0
324	Neu5Ac α 2-6Gal β 1-3(6-O-Su)GlcNAc-sp3		361	80	0
325	Neu5Ac α 2-3Gal β 1-4Glc β -dipeptide		275	57	0
326	Neu5Ac α 2-3Gal β 1-4Glc β -dipeptide		311	65	0
327	Neu5Ac α 2-3Gal β 1-4Glc β -dipeptide		495	125	0
328	Neu5Ac α 2-3Gal β 1-4Glc β -dipeptide		298	55	0
329	Neu5Ac α 2-3Gal β 1-4Glc β -dipeptide		586	133	0
331	Neu5Gc α 2-3Gal β 1-3GlcNAc β -sp3		2552	467	5
332	Neu5Ac α 2-3Gal β 1-4Glc β -dipeptide		381	91	0
333	Neu5Gc α 2-3Gal β 1-3-(6-O-Su)GlcNAc β -sp3		4811	1109	5
334	Neu5Gc α 2-3Gal β 1-4-(6-O-Su)GlcNAc β -sp3		1639	274	2
335	Neu5Ac α 2-3Gal β 1-3-(6-O-Su)GlcNAc β -sp3		6401	1102	6
336	α Kdo-(2 \rightarrow 8)- α Kdo-(2 \rightarrow 4)- α Kdo-sp11		5921	1649	10
337	GalNAc α 1-4Gal β 1-4GlcNAc β -sp3		4219	657	7
338	Neu5Ac α 2-6Gal β 1-3GalNAc α -sp3		306	59	0
339	Neu5Ac β 2-6Gal β 1-3GalNAc α -sp3		1931	365	3
340	Gal α 1-3(Neu5Ac β 2-6)GalNAc β -sp3		2907	760	4
341	Neu5Ac α 2-3-(6-Su)Gal β 1-4GlcNAc β -sp2		5964	1255	9
359	Gal α 1-3(Fuc α 1-2)Gal β 1-3GlcNAc β -sp3	B (type 1)	400	112	0
360	Gal α 1-3(Fuc α 1-2)Gal β 1-4GlcNAc β -sp3	B (type 2)	5071	644	6
362	Gal α 1-3(Fuc α 1-2)Gal β 1-3GalNAc α -sp3	B (type 3)	8283	2150	14
363	Gal α 1-3(Fuc α 1-2)Gal β 1-3GalNAc β -sp3	B (type 4)	2728	589	6
364	Gal α 1-3Gal β 1-4(Fuc α 1-3)GlcNAc β -sp3	α GalLe ^x	541	116	0
365	Gal α 1-4(Fuc α 1-2)Gal β 1-4GlcNAc β -sp3		962	361	1
366	GalNAc α 1-3(Fuc α 1-2)Gal β 1-3GlcNAc β -sp3	A (type 1)	351	71	0
368	GalNAc α 1-3(Fuc α 1-2)Gal β 1-4GlcNAc β -sp3	A (type 2)	2621	625	2
369	GalNAc α 1-4(Fuc α 1-2)Gal β 1-4GlcNAc β -sp3		3246	374	3
370	Crypted	Crypted	2629	835	3
371	Fuc α 1-2Gal β 1-3(Fuc α 1-4)GlcNAc β -sp3	Le ^B	307	107	0
372	Fuc α 1-2Gal β 1-4(Fuc α 1-3)GlcNAc β -sp3	Le ^Y	3936	1040	8
373	Gal α 1-3Gal β 1-4GlcNAc β 1-3Gal β -sp3	Galili (tetra)	777	128	0
374	Gal α 1-3(Gal α 1-4)Gal β 1-4GlcNAc β -sp3	Gal α 2-3',4'LN	280	72	0
375	Gal α 1-4GlcNAc β 1-3Gal β 1-4GlcNAc β -sp3		1032	190	1
377	Gal β 1-3GlcNAc β 1-3Gal β 1-3GlcNAc β -sp2		827	166	1
378	Gal β 1-3GlcNAc α 1-3Gal β 1-4GlcNAc β -sp3		10106	2009	9
379	Gal β 1-3GlcNAc β 1-3Gal β 1-4GlcNAc β -sp3		1304	387	1

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380	Galβ1-3GlcNAcα1-6Galβ1-4GlcNAcβ-sp2		2306	344	1
381	Galβ1-3GlcNAcβ1-6Galβ1-4GlcNAcβ-sp2		2581	827	3
382	Galβ1-3GalNAcβ1-4Galβ1-4Glcβ-sp3	GA1, asialo-GM1	642	125	0
383	Galβ1-4GlcNAcβ1-3Galβ1-4Glcβ-sp4	LNnT	280	74	0
384	Galβ1-4GlcNAcβ1-3Galβ1-4GlcNAcβ-sp2	i	290	76	0
386	Galβ1-4GlcNAcα1-6Galβ1-4GlcNAcβ-sp2		3822	638	2
387	Galβ1-4GlcNAcβ1-6Galβ1-4GlcNAcβ-sp2		2719	521	2
388	Galβ1-4GlcNAcβ1-6(Galβ1-3)GalNAcα-sp3		229	77	0
389	GalNAcβ1-3Galα1-4Galβ1-4Glcβ-sp3	Gb4, P	399	90	0
390	(Glcα1-4) ₄ β-sp4	maltotetraose	13504	2947	10
394	GlcNAcβ1-4 Galβ1-4GlcNAcβ-sp2		2286	487	3
	GlcNAcβ1-3				
395	GlcNAcβ1-6(GlcNAcβ1-3)Galβ1-4GlcNAcβ-sp2	T _k	1249	316	0
396	(GlcNAcβ1) ₃ -3,4,6-GalNAcα-sp3		4966	727	4
397	(GlcNAcβ1) ₃ -3,4,6-GalNAcα-sp3		7793	1480	9
398	Galβ1-3GlcN(Fm)β1-3Galβ1-4GlcNAcβ-sp3		557	106	0
399	Galβ1-3GlcNAcα1-3Galβ1-3GlcNAcβ-sp2		6788	1178	10
401	Galβ1-3GlcNAcβ1-3Galβ1-3GlcNAcβ-sp3		717	181	0
402	GalNAcα1-3 Galα1-4GlcNAcβ-sp3		175	45	0
	Fucα1-2				
403	Galβ1-3GlcNAcβ1-3Galβ1-4GlcNAcβ-sp2		2047	376	4
404	GalNAcα1-3Galβ1-4(Fucα1-3)GlcNAcβ-sp3	αGalNAcLe ^x	3611	1529	5
405	Galα1-3(Fucα1-2)Galα1-4GlcNAcβ-sp3		2929	227	1
406	GalNAcα1-3(Fucα1-2)Galα1-3GalNAcβ-sp3		304	60	0
419	3-O-SuGalβ1-4GlcNAcβ1-3Galβ1-4GlcNAcβ-sp3		2425	448	3
420	4-O-SuGalβ1-4GlcNAcβ1-3Galβ1-4GlcNAcβ-sp3		894	183	1
423	Neu5Acα2-3Galβ1-4(Fucα1-3)GlcNAcβ-sp3	SiaLe ^x	1673	483	1
425	Neu5Acα2-3Galβ1-4 GlcNAcβ-sp3		2164	673	2
	Fucβ1-3				
426	Neu5Acα2-3Galβ1-3(Fucα1-4)GlcNAcβ-sp3	SiaLe ^A	216	60	0
428	Neu5Acα2-3Galβ1-4(Fucα1-3)(6-O-Su)GlcNAcβ-sp3	6-OSu-SLe ^x	429	149	0

429	Neu5Ac α 2-3(6-O-Su)Gal β 1-4(Fuc α 1-3)GlcNAc β -sp3	6'-OSu-SiaLe ^x	762	222	2
431	Neu5Ac α 2-3Gal β 1-4(2-O-Su-Fuc α 1-3)GlcNAc β -sp3		918	242	2
432	Neu5Ac α 2-3Gal β 1-4 GlcNAc β -sp3 3-O-Su-Fuc α 1-3		546	207	0
433	Neu5Ac α 2-6(Neu5Ac α 2-3Gal β 1-3)GalNAc α -sp3		203	66	0
434	Neu5Ac α 2-8Neu5Ac α 2-3Gal β 1-4Glc β -sp4	GD3	287	84	0
435	Neu5Ac α 2-3Gal β 1-4(2-O-Su-Fuc α 1-3)(6-O-Su)GlcNAc β -sp3		425	133	0
436	4-O-Su-Neu5Ac α 2-3Gal β 1-4(Fuc α 1-3)(6-O-Su)GlcNAc β -sp3		963	415	2
437	GalNAc α 1-3(Fuc α 1-2)Gal β 1-3GalNAc β -sp3	A(type 4)	33886	3193	18
438	Fuc β 1-2Gal β 1-4(Fuc α 1-3)GlcNAc β -sp3		460	131	0
439	α Kdo-(2 \rightarrow 4)- α Kdo-(2 \rightarrow 4)- α Kdo-(2 \rightarrow 6)- β GlcNAc-sp11		5179	1212	9
440	Neu5Ac β 2-6(Fuc α 1-2)Gal β 1-4GlcNAc β -sp3		2150	416	3
441	Neu5Ac α 2-6(Fuc α 1-2)Gal β 1-4GlcNAc β -sp3		719	160	1
442	Neu5Ac α 2-3 (GalNAc β 1-4)Gal β 1-4Glc β -sp4	GM2	499	111	0
479	Fuc α 1-2Gal β 1-3GlcNAc β 1-3Gal β 1-4Glc β -sp4	LNFP I	512	286	0
480	Fuc α 1-2Gal β 1-3GlcNAc β 1-3Gal β 1-4GlcNAc β -sp2	H(type 1) penta	3826	911	8
481	Gal α 1-3Gal β 1-4GlcNAc β 1-3Gal β 1-4Glc β -sp4	Galili (penta)	241	60	0
482	Gal α 1-3(Fuc α 1-2)Gal β 1-3(Fuc α 1-4)GlcNAc β -sp3	BL ^{eB}	1726	229	3
483	Gal α 1-3(Fuc α 1-2)Gal β 1-4(Fuc α 1-3)GlcNAc β -sp3	BL ^{eY}	2689	293	3
484	GalNAc α 1-3(Fuc α 1-2)Gal β 1-3(Fuc α 1-4)GlcNAc β -sp3	AL ^{eB}	175	49	0
485	Gal β 1-4GalNAc α 1-3(Fuc α 1-2)Gal β 1-4GlcNAc β -sp3		2643	642	4
488	Gal β 1-4GlcNAc β 1-6(Gal β 1-4GlcNAc β 1-3)GalNAc α -sp3		284	69	0
489	Gal β 1-4GlcNAc β 1-3(GlcNAc β 1-6)Gal β 1-4GlcNAc β -sp2		541	172	0
490	Gal β 1-4GlcNAc β 1-6(GlcNAc β 1-3)Gal β 1-4GlcNAc β -sp2		527	119	0
491	GalNAc α 1-3(Fuc α 1-2)Gal β 1-4(Fuc α 1-3)GlcNAc β -sp3	AL ^{eY}	213	65	0
492	(Glc α 1-6) ₅ β -sp4	isomaltopentaose	1151	263	2
493	(GlcNAc β 1-4) ₅ β -sp4	chitopentaose	1798	509	1
495	Man α 1-6(Man α 1-3)Man α 1-6(Man α 1-3)Man β -sp4	Man ₅	892	319	1

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496	Fuca1-2Galβ1-3(Fuca1-4)GlcNAcβ1-3Galβ1-4Glcβ-sp4	Le ^b (hexa)	223	72	0
497	Fuca1-2Galβ1-4(Fuca1-3)GlcNAcβ1-3Galβ1-4Glcβ-sp4	Le ^Y (hexa)	2057	212	4
498	Galβ1-4GlcNAcβ1-3Galβ1-4GlcNAcβ1-3Galβ1-4GlcNAcβ-sp3	(LN) ₃	201	62	0
499	Galβ1-4GlcNAcβ1-6(Galβ1-4GlcNAcβ1-3)Galβ1-4GlcNAcβ-sp2	I	200	45	0
501	Galβ1-3GalNAcβ1-3Galα1-4Galβ1-4Glcβ-sp4	Gb5	1360	254	1
502	(Glcα1-6) ₆ β-sp4	maltohexaose	3033	653	5
503	(GlcNAcβ1-4) ₆ -sp4	chitohexaose	2396	314	1
504	(A-GN-M) ₂ -3,6-M-GN-GNβ-sp4	9-OS	200	57	0
505	(GN-M) ₂ -3,6-M-GN-GNβ-sp4	7-OS	728	195	0
506	Araf6	Ara6	158	37	0
507	GalNAcα1-3GalNAcβ1-3Galα1-4Galβ1-4Glcβ-sp3	Fs-5	2021	988	3
508	GalNAcβ1-3(Fuca1-2)Galβ1-4(Fuca1-3)GlcNAcβ-sp3		402	93	0
509	Galβ1-3GalNAcβ1-4(Neu5Acα2-3)Galβ1-4Glcβ-sp4	GM1	1553	448	3
527	Neu5Acα2-3Galβ1-4GlcNAcβ1-3Galβ1-4GlcNAcβ-sp2		179	48	0
528	Neu5Acα2-3Galβ1-4(Fuca1-3)GlcNAcβ1-3Galβ-sp3	SiaLe ^x -3Gal	203	49	0
529	Neu5Acα2-6(Galβ1-3)GlcNAcβ1-3Galβ1-4Glcβ-sp4	LSTb	297	70	0
530	(Neu5Acα2-3Galβ1)2-3,4-GlcNAcβ-sp3		1529	352	1
531	Neu5Acα2-8Neu5Acα2-3(GalNAcβ1-4)Galβ1-4Glcβ-sp2	GD2	434	116	0
534	Neu5Acα2-3Galβ1-4GlcNAcβ1-3Galβ1-4GlcNAcβ-sp3		193	58	0
535	Neu5Acα2-8Neu5Acα2-3(GalNAcβ1-4)Galβ1-4Glc-sp4	GD2	234	61	0
536	Neu5Acα2-3Galβ1-3GlcNAcβ1-3Galβ1-4Glcβ-sp4	LSTa	342	92	0
537	Neu5Acα2-3Galβ1-4GlcNAcβ1-3Galβ1-4Glcβ-sp4	LSTd	202	61	0
538	Galβ1-4(Fuca1-3)GlcNAcβ1-6(Galβ1-3GlcNAcβ1-3)Galβ1-4Glcβ-sp4	MFLNH III	2473	712	3
539	Galβ1-4GlcNAcβ1-6(Fuca1-2Galβ1-3GlcNAcβ1-3)Galβ1-4Glcβ-sp4	MFLNH I	780	239	0
540	Galβ1-4(Fuca1-3)GlcNAcβ1-6(Neu5Ac2-6Galβ1-4GlcNAcβ1-3)Galβ1-4Glcβ-sp4	MSMFLNnH	2262	337	3

541	Galβ1-4(Fucα1-3)GlcNAcβ1-6(Fucα1-2Galβ1-3GlcNAcβ1-3)Galβ1-4Glcβ-sp4	DFLNH (a)	6347	878	7
542	Galβ1-3GlcNAcβ1-3Galβ1-4(Fucα1-3)GlcNAcβ1-6(Galβ1-3GlcNAcβ1-3)Galβ1-4Glcβ-sp4	MF(1-3)iLNO	2867	344	6
543	Fucα1-2Galβ1-3(Fucα1-4)GlcNAcβ1-3[Galβ1-4(Fucα1-3)GlcNAcβ1-6]Galβ1-4Glcβ-sp4	TFLNH	3573	657	6
545	αKdo-(2→8)-αKdo-(2→4)-αKdo-(2→6)-βGlcNAc-(1→6)αGlcNAc-sp11		3329	757	6
625	(GlcAβ1-4GlcNAcβ1-3) ₁₁₋₁₂ -NH ₂ -ol	hyaluronic acid	776	257	1
627	(Sia2-6A-GN-M) ₂ -3,6-M-GN-GNβ-sp4	11-OS, YDS	184	54	0
629	Trehalose-ethanolamine	negative control	323	71	0
630	(GlcAβ1-3GlcNAcβ1-4) ₂₀ -NH(<i>p</i> -C ₆ H ₄)CH ₂ CH ₂ NH ₂	hyaluronic acid , 8kDa	921	236	1
631	(GlcAβ1-3GlcNAcβ1-4) ₃₈ -NH(<i>p</i> -C ₆ H ₄)CH ₂ CH ₂ NH ₂	hyaluronic acid, 15-30kDa	456	174	1
632	(GlcAβ1-3GlcNAcβ1-4) ₁₃ -NH(<i>p</i> -C ₆ H ₄)CH ₂ CH ₂ NH ₂	hyaluronic acid, 4-8kDa	481	109	0
800	GlcNAcα1-4GlcNAcβ-sp3		1697	257	1
801	GalNAcα1-3GalNAc(fur)β-sp3		3988	289	2
802	Galβ1-3GalNAc(fur)β-sp3		51348	2324	20
804	[Galβ1-4GlcNAcβ-OCH ₂ CH ₂] ₂ NH	LN dimer	908	252	1
805	GalNAcβ1-4(6-O-Bn)GlcNAcβ-sp3		6754	1034	11
806	Galα1-6Glcα-sp3	α-melibiose	5469	949	4
807	GlcNAcβ1-4GlcNAcα-sp4		10158	984	8
808	Galα1-6Glcβ-sp3	melibiose	9724	1131	7
809	GalNAcβ1-3GalNAcα-sp3		8521	1509	13
810	GalNGcα1-3GalNAcα-sp3	core 5(Gc)	328	76	0
850	Galβ1-3(6-O-Su)GalNAcα-sp3	6-SuTF	341	102	0
851	Galα1-3(6-O-Su)GalNAcα-sp3	6-SuT _{αα}	267	86	0
852	GlcNAcβ1-4-[HOOC(CH ₃)CH]-3-O-GlcNAcα-sp4	GlcNAc-Murα	1056	322	1
900	H-(Gly) ₆ -NH ₂ Gly6-amide, linear	Gly ₆ -amide, linear	25036	2262	16
901	biot-CMG ₂ -NH ₂	biot-CMG₂	52213	3728	20
902	Peptide, crypted		5630	1228	6
903	Peptide, crypted		2617	897	4
904	Peptide, crypted		6111	1154	12
905	Suc-LPWYRAPK-NH ₂	RhD	16175	3630	20
906	Peptide, crypted		475	163	0
907	Peptide, crypted		457	93	0
908	Peptide, crypted		6687	2162	13
909	Peptide, crypted		812	166	1

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910	Npentyl-Indol-linked-3-NH2 (AcOH salt)	686	168	0
911	N-C5-indazole-3-CONH-PEG-NH2 (AcOH salt)	6037	1212	11

sp2 = -O(CH₂)₂NH₂

sp3 = -O(CH₂)₃NH₂

sp4 = -NHCOCH₂NH₂

sp5 = -O(CH₂)₃NH-CO(CH₂)₅NH₂

sp8 = -(OCH₂CH₂)₆NH₂

Table S2. List of glycans, their binding to human circulating IgM and IgG antibodies (n=11), expressed in relative fluorescence units (RFU) as median, and the number of human donors exceeding *cut off* (≥ 4000 RFU).

Glycan ID (#)	Structure	Common Name	IgG		IgM	
			Median	≥ 4000 RFU	Median	≥ 4000 RFU
001	Fuc α -sp3		677	0	1296	0
002	Gal α -sp3		1965	1	2752	3
003	Gal β -sp3		1466	0	7190	5
004	GalNAc α 1-OSer	T _n -Ser	1185	0	2657	2
005	GalNAc α -sp3	T _n	1332	0	6289	5
006	GalNAc β -sp3		4194	2	3882	4
007	Glc α -sp3		1168	0	1139	1
009	Glc β -sp3		1062	0	2063	1
010	GlcNAc β -sp3		1966	1	8507	6
011	GlcNAc β -sp2		1608	1	6700	6
012	GlcNAc β -sp7		1340	0	1928	1
013	GlcNAc β -sp8		2628	1	6422	7
014	GlcN(Gc) β -sp4		904	0	1840	1
015	HOCH ₂ (HOCH) ₄ CH ₂ NH ₂	aminoglucitol	265	0	484	0
016	Man α -sp3		306	0	664	1
017	Man α -sp4		1341	1	1741	1
018	Man β -sp4		761	0	1526	1
019	ManNAc β -sp4		9491	10	15659	10
020	Rha α -sp3		3789	4	24247	9
021	Gal β -sp4		1937	2	1794	1
022	GlcNAc β -sp4		845	0	708	0
023	GalNAc β -sp4		931	0	1968	1
024	GlcNAc α -sp3		6362	11	7471	7
025	GalNAc β -sp10		6646	3	4555	4
026	Rha β -sp4		7144	3	9334	5
027	3,6-O-Me ₂ -Glc β -sp3	DMG	2903	2	5166	4
028	Xyl β -sp4		846	0	1315	1
029	Fuc β -sp4		965	0	2059	2
030	Glc β -sp4		1104	0	1900	1
031	L-Ara α -sp4		1167	0	1622	1
032	GalN(Gc) β -sp3		840	0	2565	3
037	3-O-Su-Gal β -sp3		845	0	805	0

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038	3-O-Su-GalNAc β -sp3		2656	3	2252	2
041	6-O-Su-GalNAc α -sp3		2630	1	7916	6
043	6-O-Su-GlcNAc β -sp3		4577	1	5463	5
044	GlcA α -sp3	α - glucuronic acid	1237	0	2251	2
045	GlcA β -sp3	β - glucuronic acid, β - glucuronate	701	0	2263	1
046	6-H ₂ PO ₃ Glc β -sp4	Glc6P	1058	0	2567	2
047	6-H ₂ PO ₃ Man α -sp3	Man6P	838	0	1269	1
048	Neu5Ac α -sp3		549	0	693	0
049	Neu5Ac α -sp9		744	0	1206	1
050	Neu5Ac β -sp3		913	0	3326	3
051	Neu5Ac β -sp9		1209	0	4618	4
052	Neu5Gc α -sp3		999	0	1080	1
053	Neu5Gc β -sp3		995	0	1965	1
054	9-NAc-Neu5Ac α -sp3		547	0	2680	2
055	3-O-Su-GlcNAc β -sp3		5104	4	10286	8
056	Gal α -sp7		1609	1	3453	3
057	D-Rib β -sp4		953	0	1947	1
058	Fuc β -sp3		1346	0	3018	1
059	α Kdo-5-phosphate-sp11		2150	2	2808	3
060	6-O-Su-Gal β -sp3		2049	0	10416	8
061	3-O-Su-GalNAc α -sp3		1835	2	3892	5
071	Fuc α 1-2Gal β -sp3	H _{di}	1313	0	5610	5
072	Fuc α 1-3GlcNAc β -sp3		1972	0	7528	7
073	Fuc α 1-4GlcNAc β -sp3	Le	4179	5	10882	6
074	Fuc β 1-3GlcNAc β -sp3		2502	1	11474	7
075	Gal α 1-2Gal β -sp3		7844	7	6652	7
076	Gal α 1-3Gal β -sp3	B _{di}	2044	1	2442	2
077	Gal α 1-3GalNAc β -sp3		3624	2	7263	6
078	Gal α 1-3GalNAc α -sp3	T _{α, core 8}	1168	0	5643	4
080	Gal α 1-3GlcNAc β -sp3		17986	9	14484	9
081	Gal α 1-4GlcNAc β -sp3	aLN	12835	8	9160	7
082	Gal α 1-4GlcNAc β -sp8	α LN	15126	8	9476	8
083	Gal α 1-6Glc β -sp4	melibiose	5942	7	4403	3

084	Galβ1-2Galβ-sp3		4605	4	5243	4
085	Galβ1-3GlcNAcβ-sp3	Le ^c	2860	2	9867	7
086	Galβ1-3GlcNAcβ-sp2	Le ^c	3009	2	9213	6
087	Galβ1-3Galβ-sp3		1625	1	4885	4
088	Galβ1-3GalNAcβ-sp3	T _{ββ}	4769	5	5868	5
089	Galβ1-3GalNAcα-sp3	TF, core 1	1259	1	2292	4
092	Galβ1-4Glcβ-sp2	Lactose, Lac	1488	0	1608	1
093	Galβ1-4Glcβ-sp4	Lactose, Lac	14076	9	4614	5
094	Galβ1-4Galβ-sp4		1343	1	3186	2
096	Galβ1-4GlcNAcβ-sp2	N- acetylactos amine, LN	687	0	546	0
097	Galβ1-4GlcNAcβ-sp3	N- acetylactos amine, LN	757	0	601	0
098	Galβ1-4GlcNAcβ-sp5	N- acetylactos amine, LN	975	0	747	0
099	Galβ1-4GlcNAcβ-sp8	N- acetylactos amine, LN	696	0	757	0
100	Galβ1-6Galβ-sp4		4140	3	3146	4
101	GalNAcα1-3GalNAcβ-sp3	Fs-2	8924	9	15067	10
102	GalNAcα1-3Galβ-sp3	A _{di}	4766	3	13124	8
103	GalNAcα1-3GalNAcα-sp3	core 5	2423	1	17484	9
104	GalNAcβ1-3Galβ-sp3		1809	1	3131	4
105	GalNAcβ1-3GalNAcβ-sp3	para-Fs	3084	1	6100	6
106	GalNAcβ1-4GlcNAcβ-sp3	LacdiNAc	3659	1	1789	1
107	GalNAcβ1-4GlcNAcβ-sp2	LacdiNAc	1501	1	1881	2
110	Glcα1-4Glcβ-sp3	maltose	2034	1	2267	1
111	Glcβ1-4Glcβ-sp4	cellobiose	1429	1	2171	2
112	Glcβ1-6Glcβ-sp4	gentiobiose	4221	3	4103	4
113	GlcNAcβ1-3GalNAcα-sp3	core 3	2511	1	9227	8
114	GlcNAcβ1-3Manβ-sp4		2895	2	2052	1
115	GlcNAcβ1-4GlcNAcβ-Asn	chitobiose- Asn	2399	1	5255	5
116	GlcNAcβ1-4GlcNAcβ-sp3	chitobiose	6098	4	8662	7
117	GlcNAcβ1-4GlcNAcβ-sp4	chitobiose	3400	3	6934	5
118	GlcNAcβ1-6GalNAcα-sp3	core 6	1989	0	11169	7
119	Manα1-2Manβ-sp4		1260	0	1515	1
120	Manα1-3Manβ-sp4		1318	1	2124	1

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121	Man α 1-4Man β -sp4		1115	0	1508	1
122	Man α 1-6Man β -sp4		1190	0	1103	1
123	Man β 1-4GlcNAc β -sp4		1619	0	5040	6
125	6-Bn-Gal β 1-4GlcNAc β -sp2		735	0	867	0
126	6-Bn-Gal α 1-4(6-Bn)GlcNAc β -sp3		11774	8	7860	7
127	Gal β 1-4Glc β -sp4-Phe		24027	10	5351	5
128	Gal β 1-4Glc β -sp4-Trp		22860	10	4697	4
129	Gal β 1-3(6-O-Bn)GlcNAc β -sp3		909	0	1027	0
130	(6-O-Bn-Gal β 1)-3GlcNAc β -sp3		4975	3	9337	8
131	(6-O-Bn-Gal β 1)-3(6-O-Bn)GlcNAc β -sp3		2880	3	2477	2
132	Gal β 1-3GalNAc α -sp5	TF	1750	2	3748	4
133	Gal β 1-4Glc β -sp4-Ala		13553	9	3557	2
134	Gal β 1-4Glc β -sp4-Arg		17986	10	3894	3
135	Gal β 1-4Glc β -sp4-Asn		7428	8	2001	1
136	Gal β 1-4Glc β -sp4-Ile		24449	10	5144	4
137	Gal β 1-4Glc β -sp4-Nle		23698	11	5828	6
138	Gal β 1-4Glc β -sp4-Val		24229	11	4862	4
139	Gal β 1-4GlcNAc α -sp3		7107	4	7404	6
140	Gal α 1-3GalNAc(fur) β -sp3		6013	5	11683	8
142	GlcNAc α 1-3GalNAc β -sp3		10447	6	15367	8
143	Fuc α 1-2(3-O-Su)Gal β -sp3		1360	1	3954	2
144	Gal β 1-3(6-O-Su)GlcNAc β -sp2		1397	1	2172	3
145	Gal β 1-3(6-O-Su)GlcNAc β -sp3		1141	0	3235	4
146	Gal β 1-4(6-O-Su)Glc β -sp2		1278	0	3980	2
149	GlcNAc β 1-4(6-O-Su)GlcNAc β -sp2		13313	9	9010	9
150	3-O-Su-Gal β 1-3GalNAc α -sp3		882	0	2616	2
151	6-O-Su-Gal β 1-3GalNAc α -sp3		2286	2	5420	5
152	3-O-Su-Gal β 1-4Glc β -sp2	SM3	797	0	1850	2
153	6-O-Su-Gal β 1-4Glc β -sp2		3351	1	3015	3
154	3-O-Su-Gal β 1-3GlcNAc β -sp3		3261	4	9337	7
156	3-O-Su-Gal β 1-4GlcNAc β -sp2		496	0	1225	1
158	4-O-Su-Gal β 1-4GlcNAc β -sp2		1368	0	7153	4
159	4-O-Su-Gal β 1-4GlcNAc β -sp3		1266	0	6612	4
160	6-O-Su-Gal β 1-3GlcNAc β -sp2		1895	1	6993	7
161	6-O-Su-Gal β 1-3GlcNAc β -sp3		1992	1	8381	7
162	6-O-Su-Gal β 1-4GlcNAc β -sp2		618	0	1174	0

164	GlcA β 1-3GlcNAc β -sp3		2720	1	8782	7
165	GlcA β 1-3Gal β -sp3		866	0	1408	1
166	GlcA β 1-6Gal β -sp3		1783	0	3100	2
167	GlcNAc β 1-4-[HOOC(CH ₃)CH]-3-O-GlcNAc β -sp4	GlcNAc-Mur	12596	8	6005	6
168	GlcNAc β 1-4Mur-L-Ala-D-i-Gln-Lys	GMDP-Lys	24991	8	8621	7
169	Neu5Ac α 2-3Gal β -sp3	GM4	738	0	1160	1
170	Neu5Ac α 2-6Gal β -sp3		894	0	5296	4
171	Neu5Ac α 2-3GalNAc α -sp3		1245	1	2614	1
172	Neu5Ac α 2-6GalNAc α -sp3	SiaT _n	6510	2	4855	4
173	Neu5Ac β 2-6GalNAc α -sp3		1035	0	5472	4
174	Neu5Gc α 2-6GalNAc α -sp3	Neu5GcTn	1244	0	5605	5
175	Neu5Gc β 2-6GalNAc α -sp3		980	0	3826	2
176	3-O-Su-Gal β 1-4(6-O-Su)Glc β -sp2		937	0	2054	1
177	3-O-Su-Gal β 1-4(6-O-Su)GlcNAc β -sp3		1093	1	1083	1
178	6-O-Su-Gal β 1-4(6-O-Su)Glc β -sp2		765	0	2677	2
179	6-O-Su-Gal β 1-3(6-O-Su)GlcNAc β -sp2		850	0	2060	2
180	6-O-Su-Gal β 1-4(6-O-Su)GlcNAc β -sp2		655	0	1268	0
181	3,4-O-Su ₂ -Gal β 1-4GlcNAc β -sp3		612	0	2829	3
182	3,6-O-Su ₂ -Gal β 1-4GlcNAc β -sp2		585	0	507	0
183	4,6-O-Su ₂ -Gal β 1-4GlcNAc β -sp2		1557	0	8861	8
184	4,6-O-Su ₂ -Gal β 1-4GlcNAc β -sp3		1386	0	7879	6
186	Neu5Ac α 2-8Neu5Ac α 2-sp3	(Neu5Ac) ₂ , (Sia) ₂	315	0	285	0
187	Neu5Ac α 2-8Neu5Ac α 2-sp9	(Sia) ₂	370	0	449	0
188	Neu5Ac α 2-8Neu5Ac β -sp9		649	0	5047	4
189	3,6-O-Su ₂ -Gal β 1-4(6-O-Su)GlcNAc β -sp2		1049	0	1989	1
190	Gal β 1-4-(6-P)GlcNAc β -sp2		831	0	1237	0
191	6-P-Gal β 1-4GlcNAc β -sp2		1814	2	4644	3
192	GalNAc β 1-4(6-O-Su)GlcNAc β -sp3		2549	2	2059	1
193	3-O-Su-GalNAc β 1-4GlcNAc β -sp3		5239	3	5131	5
194	6-O-Su-GalNAc β 1-4GlcNAc β -sp3		769	0	2238	2
195	6-O-Su-GalNAc β 1-4(3-O-Ac)GlcNAc β -sp3		820	0	1976	1
196	3-O-Su-GalNAc β 1-4(3-O-Su)GlcNAc β -sp3		3124	3	4423	6
197	3,6-O-Su ₂ -GalNAc β 1-4GlcNAc β -sp3		6226	4	4697	5
198	4,6-O-Su ₂ -GalNAc β 1-4GlcNAc β -sp3		522	0	811	0
199	4,6-O-Su ₂ -GalNAc β 1-4-(3-O-Ac)GlcNAc β -sp3		787	0	2264	1

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200	4-O-Su-GalNAc β 1-4GlcNAc β -sp3		457	0	633	0
201	3,4-O-Su ₂ -GalNAc β 1-4GlcNAc β -sp3		2862	1	6143	7
202	6-O-Su-GalNAc β 1-4(6-O-Su)GlcNAc β -sp3		5303	3	3194	2
203	Gal β 1-4(6-O-Su)GlcNAc β -sp2		554	0	624	0
204	4-O-Su-GalNAc β 1-4GlcNAc β -sp2		2579	1	699	0
205	Neu5Ac α 2-6GalNAc β -sp3		4506	1	3927	3
206	Neu5Gc α 2-3Gal β -sp3		662	0	640	0
207	Neu5Ac β 2-6GalNAc β -sp3		904	0	4445	4
208	Gal β 1-3GlcNAc β -sp4	Le ^e	1436	1	910	1
209	α Kdo-(2 \rightarrow 4)- α Kdo-sp11		3676	4	7193	5
210	L,D-Hep-(1 \rightarrow 5)- α Kdo-4-phosphate-sp11		929	0	3597	3
211	α Kdo-(2 \rightarrow 8)- α Kdo-sp11		5903	6	7650	6
212	D-glycero- α -D-talo-octulosonic acid (Ko)-(2 \rightarrow 4)- α Kdo-sp11		1343	1	2250	1
213	Neu5Ac β 2-6Gal β -sp3		1336	0	4532	4
214	Δ GlcA β 1-3Gal β -sp3	Δ GlcA β 3Gal	739	0	1900	1
215	Fuc α 1-2Gal β 1-3GlcNAc β -sp3	Le ^d , H (type 1)	801	0	4142	3
216	Fuc α 1-2Gal β 1-4GlcNAc β -sp3	H (type 2)	348	0	548	0
217	Fuc α 1-2Gal β 1-3GalNAc α -sp3	H (type 3)	894	0	2751	2
219	Fuc α 1-2Gal β 1-4Glc β -sp4	H (type 6)	7996	6	2440	3
220	Gal α 1-3Gal β 1-4Glc β -sp2		1372	0	3201	4
221	Gal α 1-3Gal β 1-4Glc β -sp4		6739	7	3490	3
222	Gal α 1-3Gal β 1-4GlcNAc β -sp3	Galili (tri)	1875	2	3719	3
223	Gal α 1-4Gal β 1-4Glc β -sp2	P ^k , Gb3, GbOse ₃	2134	1	5424	6
225	Gal α 1-4Gal β 1-4GlcNAc β -sp2	P ₁	1812	1	6721	5
226	Gal α 1-3(Fuc α 1-2)Gal β -sp3	B _{tri}	1107	0	2283	2
227	Gal α 1-3(Fuc α 1-2)Gal β -sp5	B _{tri}	1044	0	2078	2
228	Gal β 1-2Gal α 1-3GlcNAc β -sp3		4034	4	4644	5
229	Gal β 1-3Gal β 1-4GlcNAc β -sp4		1178	0	5158	5
231	Gal β 1-4GlcNAc β 1-3GalNAc α -sp3		755	0	2856	2
232	Gal β 1-4GlcNAc β 1-6GalNAc α -sp3		2262	2	7259	7
233	Gal β 1-3(Fuc α 1-4)GlcNAc β -sp3	Le ^a	558	0	788	1
234	Gal β 1-4(Fuc α 1-3)GlcNAc β -sp3	Le ^x	424	0	345	0
235	GalNAc α 1-3(Fuc α 1-2)Gal β -sp3	A _{tri}	3866	3	3878	2
236	GalNAc α 1-3(Fuc α 1-2)Gal β -sp5	A _{tri}	3469	3	2384	3

237	GalNH α 1-3(Fuca1-2)Gal β -OCH ₂ CH ₂ CH ₂ NHAc	AB _{tri}	498	0	453	0
239	GalNAc β 1-3(Fuca1-2)Gal β -sp3		819	0	3372	4
240	(Glc α 1-4) ₃ β -sp4	maltotriose	1176	1	1655	2
241	(Glc α 1-6) ₃ β -sp4	isomaltotriose	1125	0	1146	0
242	GlcNAc α 1-3Gal β 1-4GlcNAc β -sp2		2786	3	14904	9
243	GlcNAc α 1-3Gal β 1-4GlcNAc β -sp3		3035	2	16162	9
245	GlcNAc α 1-6Gal β 1-4GlcNAc β -sp2		3974	3	4436	5
246	GlcNAc β 1-2Gal β 1-3GalNAc α -sp3		14644	10	11352	9
247	GlcNAc β 1-3Gal β 1-3GalNAc α -sp3		988	0	3707	2
248	GlcNAc β 1-3Gal β 1-4Glc β -sp2		1050	0	1930	1
249	GlcNAc β 1-3Gal β 1-4GlcNAc β -sp2		565	0	820	0
250	GlcNAc β 1-3Gal β 1-4GlcNAc β -sp3		1365	1	685	0
251	GlcNAc β 1-4Gal β 1-4GlcNAc β -sp2		7196	5	12322	7
252	GlcNAc β 1-4GlcNAc β 1-4GlcNAc β -sp4	chitotriose	3352	2	6177	6
253	GlcNAc β 1-6Gal β 1-4GlcNAc β -sp2		1161	1	2113	1
254	GlcNAc β 1-6(Gal β 1-3)GalNAc α -sp3	core 2	1163	1	2812	4
255	GlcNAc β 1-6(GlcNAc β 1-3)GalNAc α -sp3	core 4	4251	2	8235	8
256	GlcNAc β 1-6(GlcNAc β 1-4)GalNAc α -sp3		12212	10	16124	10
258	Man α 1-6(Man α 1-3)Man β -sp4	Man ₃	916	0	1610	1
259	Gal β 1-4(Gal β 1-3)GlcNAc β -sp3		589	0	741	1
260	Gal β 1-3(Fuc β 1-4)GlcNAc β -sp3		544	0	472	0
261	Gal β 1-4(Fuc β 1-3)GlcNAc β -sp3		1066	1	611	0
262	Gal β 1-3GalNAc β 1-3Gal β -sp4		3215	3	5652	4
263	(GalNAc β -PEG ₂) ₃ - β -DD		7288	2	7754	7
264	Gal β 1-4Gal β 1-4GlcNAc β -sp3		5559	5	11786	8
266	Gal α 1-4Gal β 1-4GlcNAc β -sp3	P ₁	1416	0	5773	5
267	GlcNAc β 1-3Gal β 1-3GlcNAc β -sp3		2536	3	11891	7
268	GlcNAc β 1-4(Fuca1-6)GlcNAc β -sp3		2776	1	5150	6
269	Gal β 1-3Gal β 1-4Glc β -sp4		5049	5	5410	5
270	Gal β 1-4Gal β 1-4Glc β -sp4		1923	1	5551	4
271	Gal β 1-6Gal β 1-4Glc β -sp4		2703	3	6145	6
272	Neu5Ac α 2-3Gal β 1-4Glc β -sp4-Cit		10986	6	1191	1
273	Fuc β 1-2Gal β 1-4GlcNAc β -sp3		795	0	3725	2
274	GalNAc α 1-3Gal β 1-4GlcNAc β -sp3		4604	2	13900	8
275	GalNAc β 1-3Gal β 1-4GlcNAc β -sp3		1060	0	2174	2
276	GlcNAc β 1-4Gal β 1-4GlcNAc β -sp3		8309	6	10740	7

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277	GalN(Gc) α 1-3(Fuca1-2)Gal β -sp3	A _{tri} (Gc)	1220	2	762	0
278	GalNAc α 1-3GalNAc β 1-3Gal β -sp3	Fs-3	8792	8	19525	9
287	3-O-Su-Gal β 1-3(Fuca1-4)GlcNAc β -sp3	3'-O-Su-Le ^a	532	0	942	1
288	3-O-Su-Gal β 1-4(Fuca1-3)GlcNAc β -sp3	3'-O-Su-Le ^x	2314	1	283	0
289	Neu5Ac α 2-6(Gal β 1-3)GalNAc α -sp3		746	0	1834	2
290	Neu5Ac α 2-6(Gal α 1-3)GalNAc α -sp3		410	0	1350	1
291	Neu5Ac β 2-6(Gal β 1-3)GalNAc α -sp3		3034	1	4043	4
292	Neu5Ac α 2-3Gal β 1-3GalNAc α -sp3		559	0	1716	1
293	Neu5Ac α 2-3Gal β 1-4Glc β -sp3	3'SL	516	0	777	0
294	Neu5Ac α 2-3Gal β 1-4Glc β -sp4	3'SL	9946	4	1779	2
295	Neu5Ac α 2-6Gal β 1-4Glc β -sp2	6'SL	442	0	691	1
296	Neu5Ac α 2-6Gal β 1-4Glc β -sp4	6'SL	1172	1	1959	2
297	Neu5Ac β 2-6Gal β 1-4Glc β -sp2		703	0	3047	2
298	Neu5Ac α 2-3Gal β 1-4GlcNAc β -sp3	3'SLN	286	0	409	0
299	Neu5Ac α 2-3Gal β 1-3GlcNAc β -sp3	3'SiaLeC	3900	5	10595	7
300	Neu5Ac α 2-6Gal β 1-4GlcNAc β -sp3	6'SLN	333	0	399	0
302	Neu5Ac β 2-6Gal β 1-4GlcNAc β -sp3		745	0	2542	2
303	Neu5Gc α 2-3Gal β 1-4GlcNAc β -sp3		296	0	475	0
304	Neu5Gc α 2-6Gal β 1-4GlcNAc β -sp3		345	0	323	0
305	Neu5Gc β 2-6Gal β 1-4GlcNAc β -sp3		829	0	1399	1
306	9-NAc-Neu5Ac α 2-6Gal β 1-4GlcNAc β -sp3		498	0	4101	2
307	KDN α 2-3Gal β 1-3GlcNAc β -sp2		2710	1	10405	7
308	KDN α 2-3Gal β 1-4GlcNAc β -sp2		571	0	2363	2
309	Neu5Ac α 2-6(Neu5Ac α 2-3)GalNAc α -sp3		307	0	527	0
310	Neu5Ac α 2-3Gal β 1-4GlcNAc β - O(CH ₂) ₃ NH-amide-Neu5Ac α 2-3Gal β 1- 4GlcNAc β -sp3		325	0	262	0
315	Neu5Ac α 2-3Gal β 1-4-(6-O-Su)GlcNAc β - sp3		362	0	460	0
316	Fuca1-2(6-O-Su)Gal β 1-4GlcNAc β -sp3	6'- suH(type2)	365	0	420	0
318	Neu5Ac α 2-6Gal β 1-4(6-O-Su)GlcNAc β - sp3		341	0	624	0
319	Neu5Ac α 2-3(6-O-Su)Gal β 1-4GlcNAc β - sp3		276	0	306	0
320	4-O-Su-Neu5Ac α 2-3(6-O-Su)Gal β 1- 4GlcNAc β -sp3		417	0	811	0
321	(Neu5Ac α 2-8) ₃ -sp3	(Sia) ₃	300	0	350	0
322	(Neu5Ac α 2-8) ₃ β -sp3		625	0	3557	3
323	Neu5Ac α 2-6Gal β 1-3GlcNAc β -sp3	6'-SiaLe ^c	916	0	2338	3

324	Neu5Ac α 2-6Gal β 1-3(6-O-Su)GlcNAc β -sp3		909	0	1249	1
325	Neu5Ac α 2-3Gal β 1-4Glc β -sp4-Ala		10125	6	1355	1
326	Neu5Ac α 2-3Gal β 1-4Glc β -sp4-Ile		10081	6	1340	1
327	Neu5Ac α 2-3Gal β 1-4Glc β -sp4-Nle		11318	6	1616	1
328	Neu5Ac α 2-3Gal β 1-4Glc β -sp4-Phe		10120	5	1378	1
329	Neu5Ac α 2-3Gal β 1-4Glc β -sp4-Trp		13038	6	2253	2
330	Neu5Ac α 2-3Gal β 1-4Glc β -sp4-Val		11273	6	1070	0
331	Neu5Gc α 2-3Gal β 1-3GlcNAc β -sp3		4086	5	11438	7
332	Neu5Ac α 2-3Gal β 1-4Glc β -sp4-Asn		8253	6	1138	0
333	Neu5Gc α 2-3Gal β 1-3(6-O-Su)GlcNAc β -sp3		1627	1	2619	2
334	Neu5Gc α 2-3Gal β 1-4(6-O-Su)GlcNAc β -sp3		1083	1	691	0
335	Neu5Ac α 2-3Gal β 1-3(6-O-Su)GlcNAc β -sp3		1467	1	1703	2
336	α Kdo-(2 \rightarrow 8)- α Kdo-(2 \rightarrow 4)- α Kdo-sp11		8196	6	8844	6
337	GalNAc α 1-4Gal β 1-4GlcNAc β -sp3		3479	5	7396	7
338	Neu5Ac α 2-6Gal β 1-3GalNAc α -sp3	6'-sialyl-TF	1124	1	1195	0
339	Neu5Ac β 2-6Gal β 1-3GalNAc α -sp3		1024	0	5501	5
340	Gal α 1-3(Neu5Ac β 2-6)GalNAc β -sp3		935	0	5384	5
341	Neu5Ac α 2-3-(6-O-Su)Gal β 1-4GlcNAc β -sp2		287	0	388	0
359	Gal α 1-3(Fuc α 1-2)Gal β 1-3GlcNAc β -sp3	B (type 1)	5790	3	4958	3
360	Gal α 1-3(Fuc α 1-2)Gal β 1-4GlcNAc β -sp3	B (type 2)	976	1	2409	3
361	Gal α 1-3(Fuc α 1-2)Gal β 1-4GlcNAc β -sp2	B (type 2)	879	0	2360	3
362	Gal α 1-3(Fuc α 1-2)Gal β 1-3GalNAc α -sp3	B (type 3)	2839	2	3936	4
363	Gal α 1-3(Fuc α 1-2)Gal β 1-3GalNAc β -sp3	B (type 4)	4122	2	3028	3
364	Gal α 1-3Gal β 1-4(Fuc α 1-3)GlcNAc β -sp3	α GalLe ^x	1844	2	1224	0
365	Gal α 1-4(Fuc α 1-2)Gal β 1-4GlcNAc β -sp3		1364	0	2913	3
366	GalNAc α 1-3(Fuc α 1-2)Gal β 1-3GlcNAc β -sp3	A (type 1)	6857	5	5894	6
368	GalNAc α 1-3(Fuc α 1-2)Gal β 1-4GlcNAc β -sp3	A (type 2)	2223	1	4757	4
369	GalNAc α 1-4(Fuc α 1-2)Gal β 1-4GlcNAc β -sp3		2407	2	10296	5
370	GalNAc β 1-3(Fuc α 1-2)Gal β 1-4GlcNAc β -sp3		500	0	1364	1
371	Fuc α 1-2Gal β 1-3(Fuc α 1-4)GlcNAc β -sp3	Le ^b	984	0	2419	2
372	Fuc α 1-2Gal β 1-4(Fuc α 1-3)GlcNAc β -sp3	Le ^y	731	1	307	0
373	Gal α 1-3Gal β 1-4GlcNAc β 1-3Gal β -sp3	Galili (tetra)	4446	2	5824	4
374	Gal α 1-3(Gal α 1-4)Gal β 1-4GlcNAc β -sp3		1653	1	3479	5
375	Gal α 1-4GlcNAc β 1-3Gal β 1-4GlcNAc β -		9635	8	10750	8

Supplementary Material

	sp3					
376	Galβ1-3GlcNAcβ1-3Galβ1-4Glcβ-sp4	N-acetylacto- N-tetraose, LNT	15939	6	3004	4
377	Galβ1-3GlcNAcβ1-3Galβ1-3GlcNAcβ-sp2		2338	2	8026	6
378	Galβ1-3GlcNAcα1-3Galβ1-4GlcNAcβ-sp3		17225	9	12928	8
379	Galβ1-3GlcNAcβ1-3Galβ1-4GlcNAcβ-sp3		512	0	913	1
380	Galβ1-3GlcNAcα1-6Galβ1-4GlcNAcβ-sp2		17866	9	6284	6
381	Galβ1-3GlcNAcβ1-6Galβ1-4GlcNAcβ-sp2		809	0	1027	1
382	Galβ1-3GalNAcβ1-4Galβ1-4Glcβ-sp3	GA1, asialo-GM1	2614	2	7904	7
383	Galβ1-4GlcNAcβ1-3Galβ1-4Glcβ-sp4	N-acetylacto- neo- tetraose, LNnT	10513	6	2315	3
384	Galβ1-4GlcNAcβ1-3Galβ1-4GlcNAcβ-sp2	i	777	1	324	0
386	Galβ1-4GlcNAcα1-6Galβ1-4GlcNAcβ-sp2		4895	3	7764	5
387	Galβ1-4GlcNAcβ1-6Galβ1-4GlcNAcβ-sp2		2520	1	1290	1
388	Galβ1-4GlcNAcβ1-6(Galβ1-3)GalNAcα-sp3		986	0	1576	2
389	GalNAcβ1-3Galα1-4Galβ1-4Glcβ-sp3	Gb4, P	7335	5	7361	5
390	(Glcα1-4) ₄ β-sp4	maltotetrao- se	1660	0	4170	2
392	GalNAcα1-3(Fuca1-2)Galβ1-3GalNAcα-sp3	A (type 3)	7921	4	8230	6
394	GlcNAcβ1-4(GlcNAcβ1-3)Galβ1-4GlcNAcβ-sp2		3171	4	4225	3
395	GlcNAcβ1-6(GlcNAcβ1-3)Galβ1-4GlcNAcβ-sp2	T _k	6193	1	861	1
396	(GlcNAcβ1) ₃ -3,4,6-GalNAcα-sp3		4518	4	9667	7
397	Galβ1-3GlcN(Fm)β1-3Galβ1-4GlcNAcβ-sp3		11759	8	13243	7
398	Galβ1-3GlcN(Fm)β1-3Galβ1-3GlcNAcβ-sp3		4683	5	13263	8
399	Galβ1-3GlcNAcα1-3Galβ1-3GlcNAcβ-sp2		10316	9	14915	9
401	Galβ1-3GlcNAcβ1-3Galβ1-3GlcNAcβ-sp3		2680	3	8965	6
404	GalNAcα1-3Galβ1-4(Fuca1-3)GlcNAcβ-sp3	αGalNAcLe _x	3138	1	7775	6
405	Galα1-3(Fuca1-2)Galα1-4GlcNAcβ-sp3		1374	1	2046	2
406	GalNAcα1-3(Fuca1-2)Galα1-3GalNAcβ-sp3		4198	2	4605	5

419	3-O-SuGalβ1-4GlcNAcβ1-3Galβ1-4GlcNAcβ-sp3		464	0	499	0
420	4-O-SuGalβ1-4GlcNAcβ1-3Galβ1-4GlcNAcβ-sp3		4601	4	8092	7
423	Neu5Acα2-3Galβ1-4(Fuca1-3)GlcNAcβ-sp3	SiaLe ^x	262	0	241	0
425	Neu5Acα2-3Galβ1-4(Fucβ1-3)GlcNAcβ-sp3		1689	1	317	0
426	Neu5Acα2-3Galβ1-3(Fuca1-4)GlcNAcβ-sp3	SiaLe ^a	311	0	236	0
428	Neu5Acα2-3Galβ1-4(Fuca1-3)(6-O-Su)GlcNAcβ-sp3	6-O-Su-SiaLe ^x	505	0	253	0
429	Neu5Acα2-3(6-O-Su)Galβ1-4(Fuca1-3)GlcNAcβ-sp3	6'-O-Su-SiaLe ^x	292	0	369	0
431	Neu5Acα2-3Galβ1-4(2-O-Su-Fuca1-3)GlcNAcβ-sp3		238	0	244	0
432	Neu5Acα2-3Galβ1-4(3-O-Su-Fuca1-3)GlcNAcβ-sp3		462	0	395	0
433	Neu5Acα2-6(Neu5Acα2-3Galβ1-3)GalNAcα-sp3		834	1	178	0
434	Neu5Acα2-8Neu5Acα2-3Galβ1-4Glcβ-sp4	GD3	6320	4	1221	1
435	Neu5Acα2-3Galβ1-4(2-O-Su-Fuca1-3)(6-O-Su)GlcNAcβ-sp3		374	0	573	1
436	4-O-Su-Neu5Acα2-3Galβ1-4(Fuca1-3)(6-O-Su)GlcNAcβ-sp3		472	0	903	0
437	GalNAcα1-3(Fuca1-2)Galβ1-3GalNAcβ-sp3	A(type 4)	10036	5	6650	5
438	Fucβ1-2Galβ1-4(Fuca1-3)GlcNAcβ-sp3		805	0	2364	3
439	Kdoα2-4Kdoα2-4Kdoα2-6GlcNAcβ-sp11		4774	3	6827	5
440	Neu5Acβ2-6(Fuca1-2)Galβ1-4GlcNAcβ-sp3		748	0	3748	4
441	Neu5Acα2-6(Fuca1-2)Galβ1-4GlcNAcβ-sp3		245	0	147	0
479	Fuca1-2Galβ1-3GlcNAcβ1-3Galβ1-4Glcβ-sp4	H(type1), LNFP I	7304	4	1949	2
480	Fuca1-2Galβ1-3GlcNAcβ1-3Galβ1-4GlcNAcβ-sp2	H(type 1) penta	316	0	370	0
481	Galα1-3Galβ1-4GlcNAcβ1-3Galβ1-4Glcβ-sp4	Galili (penta)	11987	6	6156	5
482	Galα1-3(Fuca1-2)Galβ1-3(Fuca1-4)GlcNAcβ-sp3	BLe ^b	1494	1	1311	1
483	Galα1-3(Fuca1-2)Galβ1-4(Fuca1-3)GlcNAcβ-sp3	BLe ^y	1006	1	1016	0
484	GalNAcα1-3(Fuca1-2)Galβ1-3(Fuca1-4)GlcNAcβ-sp3	ALe ^b	1548	1	1971	2
485	Galβ1-4GalNAcα1-3(Fuca1-2)Galβ1-4GlcNAcβ-sp3		1733	1	3789	4
491	GalNAcα1-3(Fuca1-2)Galβ1-4(Fuca1-3)GlcNAcβ-sp3	ALe ^y	1804	2	3697	4
492	(Glcα1-6) ₅ β-sp4	isomaltopen taose	1746	1	1824	1
493	(GlcNAcβ1-4) ₅ β-sp4	chitopentao se	2162	1	3545	5

Supplementary Material

495	Man α 1-6(Man α 1-3)Man α 1-6(Man α 1-3)Man β -sp4	Man ₅	507	0	952	1
496	Fuc α 1-2Gal β 1-3(Fuca1-4)GlcNAc β 1-3Gal β 1-4Glc β -sp4	Le ^b (hexa)	7203	3	3248	3
497	Fuc α 1-2Gal β 1-4(Fuca1-3)GlcNAc β 1-3Gal β 1-4Glc β -sp4	Le ^y (hexa)	6252	3	2006	2
498	Gal β 1-4GlcNAc β 1-3Gal β 1-4GlcNAc β 1-3Gal β 1-4GlcNAc β -sp3	(LN) ₃	323	0	375	0
499	Gal β 1-4GlcNAc β 1-6(Gal β 1-4GlcNAc β 1-3)Gal β 1-4GlcNAc β -sp2	I	671	1	203	0
501	Gal β 1-3GalNAc β 1-3Gal α 1-4Gal β 1-4Glc β -sp4	Gb5	6516	5	9659	8
502	(Glc α 1-6) ₆ β -sp4	isomaltohex aose	1947	2	1614	1
503	(GlcNAc β 1-4) ₆ -sp4	chitohexaos e	2022	2	3749	4
504	(A β 1-4GN β 1-2M α 1) _{2-3,6} -M β 1-4GN β 1-4GN β -sp4		267	0	142	0
505	(GN β 1-2M α 1) _{2-3,6} -M β 1-4GN β 1-4GN β -sp4		260	0	183	0
506	Ara β 1-2Ara α 1-5(Ara β 1-2Ara α 1-3)Ara α 1-5Ara α -O(CH ₂) ₂ NHCOCH ₂ (OCH ₂ CH ₂) ₆ NH ₂	Ara ₆	10893	6	9096	6
507	GalNAc α 1-3GalNAc β 1-3Gal α 1-4Gal β 1-4Glc β -sp3	Fs-5	4148	5	16634	10
508	GalNAc β 1-3(Fuca1-2)Gal β 1-4(Fuca1-3)GlcNAc β -sp3		764	0	1626	1
509	Gal β 1-3GalNAc β 1-4(Neu5Ac α 2-3)Gal β 1-4Glc β -sp4	GM1	513	0	1247	1
527	Neu5Ac α 2-3Gal β 1-4GlcNAc β 1-3Gal β 1-4GlcNAc β -sp2		388	0	391	0
528	Neu5Ac α 2-3Gal β 1-4(Fuca1-3)GlcNAc β 1-3Gal β -sp3	SiaLe ^x -Gal	409	0	508	0
529	Neu5Ac α 2-6(Gal β 1-3)GlcNAc β 1-3Gal β 1-4Glc β -sp4	LSTb	4160	3	1777	1
530	(Neu5Ac α 2-3Gal β 1) _{2-3,4} -GlcNAc β -sp3		218	0	152	0
531	Neu5Ac α 2-8Neu5Ac α 2-3(GalNAc β 1-4)Gal β 1-4Glc β -sp2	GD2	641	0	2069	1
534	Neu5Ac α 2-6Gal β 1-4GlcNAc β 1-3Gal β 1-4GlcNAc β -sp3		1161	1	290	0
535	Neu5Ac α 2-8Neu5Ac α 2-3(GalNAc β 1-4)Gal β 1-4Glc β -sp4	GD2	1524	2	850	1
536	Neu5Ac α 2-3Gal β 1-3GlcNAc β 1-3Gal β 1-4Glc β -sp4	LSTa	10168	5	2332	3
537	Neu5Ac α 2-3Gal β 1-4GlcNAc β 1-3Gal β 1-4Glc β -sp4	LSTd	9594	5	2335	3
538	Gal β 1-4(Fuca1-3)GlcNAc β 1-6(Gal β 1-3)GlcNAc β 1-3Gal β 1-4Glc β -sp4	MFLNH III	2235	2	782	1
539	Gal β 1-4GlcNAc β 1-6(Fuca1-2Gal β 1-3)GlcNAc β 1-3Gal β 1-4Glc β -sp4	MFLNH I	415	0	224	0
540	Gal β 1-4(Fuca1-3)GlcNAc β 1-6(Neu5Ac α 2-6Gal β 1-4GlcNAc β 1-3)Gal β 1-4Glc β -sp4	MSMFLNn H	938	1	552	1

541	Galβ1-4(Fuca1-3)GlcNAcβ1-6(Fuca1-2Galβ1-3GlcNAcβ1-3)Galβ1-4Glcβ-sp4	DFLNH (a)	1236	1	769	1
542	Galβ1-3GlcNAcβ1-3Galβ1-4(Fuca1-3)GlcNAcβ1-6(Galβ1-3GlcNAcβ1-3)Galβ1-4Glcβ-sp4	MF(1-3)iLNO	660	0	1937	2
545	Kdoα2-8Kdoα2-4Kdoα2GlcNAcβ1-6GlcNAcα-sp11		8516	6	8088	8
625	(GlcAβ1-3GlcNAcβ1-4) ₁₁₋₁₂ -NH ₂ -ol	hyaluronic acid	634	0	3389	1
627	(Siaα2-6Aβ1-4GNβ1-2Mα1)2-3,6-Mβ1-4GNβ1-4GNβ-sp4	11-OS, YDS	269	0	136	0
629	Trehalose-ethanolamine		344	0	995	1
630	(GlcAβ1-3GlcNAcβ1-4) ₂₀ -NH(<i>p</i> -C ₆ H ₄)CH ₂ CH ₂ NH ₂	hyaluronic acid	2342	2	1728	2
631	(GlcAβ1-3GlcNAcβ1-4) ₃₈ -NH(<i>p</i> -C ₆ H ₄)CH ₂ CH ₂ NH ₂	hyaluronic acid	755	1	676	0
632	(GlcAβ1-3GlcNAcβ1-4) ₁₃ -NH(<i>p</i> -C ₆ H ₄)CH ₂ CH ₂ NH ₂	hyaluronic acid	710	0	2377	1
800	GlcNAcα1-4GlcNAcβ-sp3		8580	5	9035	6
801	GalNAcα1-3GalNAc(fur)β-sp3		2985	3	6799	5
802	Galβ1-3GalNAc(fur)β-sp3		2236	1	9471	8
804	[Galβ1-4GlcNAcβ-OCH ₂ CH ₂] ₂ NH		360	0	580	0
805	GalNAcβ1-4(6-O-Bn)GlcNAcβ-sp3		1490	1	5025	4
806	Galα1-6Glcα-sp3		14739	9	6689	8
807	GlcNAcβ1-4GlcNAcα-sp4		7505	8	7435	7
808	Galα1-6Glcβ-sp3	melibiose	15978	10	6956	8
809	GalNAcβ1-3GalNAcα-sp3		4753	4	6160	7
810	GalNGα1-3GalNAcα-sp3		1106	0	8676	4
850	Galβ1-3(6-O-Su)GalNAcα-sp3	6-suTF	991	0	4145	4
851	Galα1-3(6-O-Su)GalNAcα-sp3		723	0	2569	3
852	GlcNAcβ1-4-[HOOC(CH ₃)CH]-3-O-GlcNAcα-sp4		6242	3	4057	5

sp2 = -O(CH₂)₂NH₂

sp3 = -O(CH₂)₃NH₂

sp4 = -NHCOCH₂NH₂

sp5 = -O(CH₂)₃NH-CO(CH₂)₅NH₂

sp8 = -(OCH₂CH₂)₆NH₂