

# Supporting Information

## Glycome Profiling of Cancer Cell Lines Cultivated in Physiological and Commercial Media

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**Figure S1.** Nutritional composition of three media: (A) Plasmax, (B) EMEM, and (C) DMEM.

**Figure S2.** Examples of positional structural identification method of (A) *N*-glycan HexNAc<sub>4</sub>Hex<sub>3</sub>DeoxyHex<sub>1</sub> from 231BR cell line and (C) *N*-glycan HexNAc<sub>4</sub>Hex<sub>5</sub>DeoxyHex<sub>1</sub> from CRL cell line using LC-MS/MS. Insets of (A) and (C) are the full MS spectra, (B) and (D) are MS/MS spectra with identified fragment ions assigned to corresponding peaks. Symbols: ■, *N*-acetylglucosamine (GlcNAc); ●, Galactose (Gal); ▼, Fucose (Fuc); ●, Mannose (Man).

**Figure S3.** Heatmaps of significant *N*-glycans from (A) 231BR cell line and (B) CRL cell line. Red color denotes up-regulation, green color denotes down-regulation.

**Figure S4.** Heatmaps of significant *O*-glycans from (A) 231BR cell line and (B) CRL cell line. Color codes are the same as **Figure S3**.

**Figure S5.** Transcript expressions of 231BR cell line. (A) Galactosyltransferases in DMEM and Plasmax; (B) *N*-acetylglucosaminyltransferases in EMEM and Plasmax. (C) Synthesis pathways of complex capping *N*- and *O*-glycans. The red box highlights the processes of connecting galactose to GlcNAc, catalyzed by B4GALT/B3GALT. (D) Synthesis pathways of *N*-glycan processing and branching. Red boxes highlight the processes of attaching GlcNAc to mannose on core structure, catalyzed by MGATs. The synthesis pathways are acquired from GlycoMaple (<https://glycosmos.org/glycomaple/index>).

**Figure S6.** Transcript expressions of CRL cell line. **(A)** *N*-acetylglucosaminyltransferases in EMEM and Plasmax; **(B)** Fucosyltransferases in EMEM and Plasmax. **(C)** Synthesis pathways of *N*-glycan processing and branching. The labeled transcripts of transferases depict the processes of attaching GlcNAc to mannose on core structure, and core-fucosylation, catalyzed by MGATs, and FUT8, respectively. The synthesis pathways are acquired from GlycoMaple (<https://glycosmos.org/glycomaple/index>).

**Figure S7.** Transcript expressions of **(A)** Sialyltransferases in 231BR cell line cultivated by DMEM and Plasmax; **(B)** Fucosyltransferases in CRL cell line cultivated by DMEM and Plasmax. **(C)** Synthesis pathways of complex capping *N*- and *O*-glycans. The labeled transcripts of transferases depict the processes of sialylation catalyzed by ST3GAL or ST6GAL, and fucosylation catalyzed by FUTs. The synthesis pathways are acquired from GlycoMaple (<https://glycosmos.org/glycomaple/index>).

**Table S1.** Full list of the formulation of Plasmax.

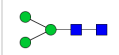




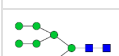













No.		(g/mol)	C (μM)	Weight for 1L(mg)
<b>1</b>	L-Alanine	89.09	510	45.44
	L-Arginine	174.20	64	11.15
	L-Asparagine	132.12	41	5.42
	L-Aspartic acid	133.10	6	0.80
	L-Glutamate	187.13	98	18.34
	Glycine	75.07	330	24.77
	L-Histidine	155.15	120	18.62
	L-Isoleucine	131.17	140	18.36
	L-Leucine	131.17	170	22.30
	L-Lysine	146.19	220	32.16
	L-Methionine	149.21	30	4.48
	L-Phenylalanine	165.19	68	11.23
	L-Proline	115.13	360	41.45
	L-Serine	105.09	140	14.71
	L-Threonine	119.12	240	28.59
	L-Tryptophan	204.23	78	15.93
	L-Tyrosine	181.19	74	13.41
	L-Valine	117.15	230	26.94
	L-Citrulline	175.19	55	9.64
	L-Cystine	240.30	65	15.62
	L-Ornithine	168.62	80	13.49
<b>2</b>	L-Cysteine	121.16	33	4.00
	(DL-2-Aminobutyric acid)	103.12	41	4.23
	L-Homocysteine	135.18	9	1.22
	4-Hydroxy-L-proline	131.13	13	1.70
	L-Pyroglutamate	129.11	20	2.58
	L-Acetyl glycine	117.10	70	8.20
	L-Carnosine	226.23	6	1.36
	Glutathione (reduced)	307.32	37	11.37
	Taurine	125.15	130	16.27
	(Betaine)	117.15	72	8.43
	Acetate	82.03	42	3.45
	Acetone	58.08	55	3.19
	(O-Acetyl-L-carnitine hydrochloride)	239.70	5	1.20
	(sodium citrate dihydrate)	294.10	114	33.53
	Carnitine	197.66	46	9.09














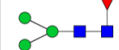
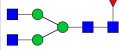





No.		(g/mol)	C (μM)	Weight for 1L(mg)
2	Creatine	131.13	37	4.85
	Creatinine	113.12	74	8.37
	(sodium formate)	68.01	33	2.24
	Glycerol	92.09	82	7.55
	(2-hydroxybutyric acid sodium salt)	126.09	31	3.91
	((+)-sodium 3-hydroxybutyrate)	126.09	77	9.71
	((+)-sodium B-hydroxyisobutyrate)	126.09	20	2.52
	Hypoxanthine	136.11	5	0.68
	Lactate	112.06	500	56.03
	Methyl acetoacetate	116.12	41	4.76
	(di-sodium succinate)	162.05	23	3.73
	Uracil	112.09	2	0.22
	Urea	60.06	3000	180.17
	Uridine	244.20	3	0.73
3	Ammonium Chloride	53.49	50	26.74
	Ferric Sulfate	399.88	1.0428	4.17
	Zinc Sulfate	287.56	1.5	4.31
	Ammonium Metavanadate	116.98	0.0026	3.04
	(copper(II) sulfate)	159.61	0.0052	8.30
	Ferric Nitrate	404.00	0.1238	500.15
	Manganous Chloride	125.84	0.0002	0.25
	Sodium Selenite	172.94	0.0289	49.98
4	Urate	190.09	270	256.62
5	L-Glutamine	146.15	650	94.99
	BME vitamins	-	-	-
6	Ascorbate	198.11	62	1228.28
	Vitamin B12	1355.37	0.005	0.68
7	EBSS	-	-	-
8	(sodium pyruvate)	110.04	100.00	11.00

**Table S2.** Major nutrients and metabolites with different amounts in Plasmax, EMEM and DMEM. The commercial media include high abundance of Glucose, Glutamine, *etc.*, while Plasmax mimics the concentration of human blood, and includes metabolites such as Urea and Urate.

<b>Nutrient</b>	<b>Plasmax</b>	<b>EMEM</b>	<b>DMEM</b>
D-Glucose	38.5%	43.5%	67.8%
Urea	20.6%	-	-
L-Glutamine	4.5%	15.7%	10.8%
Lactate	3.5%	-	-
Urate	1.9%	-	-
L-Threonine	1.7%	3.1%	2.2%
L-Lysine	1.5%	3.1%	2.2%
L-Valine	1.6%	3.1%	2.2%
Glycine	2.3%	0.8%	1.1%
Sodium Pyruvate	0.7%	7.8%	2.7%

**Table S3A.** Relative abundance of *N*-glycans from 231BR cell line.

N-glycan	Theoretical m/z	Observed m/z	Mass Accuracy (ppm)	DMEM_1	DMEM_2	DMEM_3	Avg	StdV	EMEM_1	EMEM_2	EMEM_3	Avg	StdV	Plasmax_1	Plasmax_2	Plasmax_3	Avg	StdV	P value		P value		P value	
																			DMEM	EMEM	DMEM	Plasmax	EMEM	Plasmax
	1165.6331	1165.6321	0.86	0.14534	0.11589	0.12332	0.12819	0.01531	0.13142	0.15393	0.14448	0.14328	0.01130	0.13446	0.11741	0.12798	0.12662	0.00861	2.E-01		9.E-01		1.E-01	
	889.4702	889.4701	0.11	0.04093	0.06929	0.06166	0.05729	0.01467	0.05252	0.06470	0.06486	0.06069	0.00708	0.08719	0.04621	0.10012	0.07784	0.02815	7.E-01		3.E-01		4.E-01	
	1093.5700	1093.5714	1.28	0.01909	0.02418	0.02410	0.02246	0.00291	0.03726	0.02527	0.02982	0.03078	0.00605	0.03606	0.02758	0.02703	0.03023	0.00506	1.E-01		8.E-02		9.E-01	
	787.4203	787.4194	1.14	0.02949	0.04276	0.04173	0.03799	0.00738	0.04075	0.03681	0.03340	0.03698	0.00368	0.03390	0.02595	0.03613	0.03199	0.00535	8.E-01		3.E-01		3.E-01	
	991.5201	991.5196	0.50	0.01804	0.02805	0.03018	0.02542	0.00648	0.03918	0.02479	0.02135	0.02844	0.00946	0.04125	0.02488	0.02436	0.03016	0.00961	7.E-01		5.E-01		8.E-01	
	1195.6199	1195.6218	1.59	0.01195	0.01051	0.01193	0.01147	0.00082	0.02660	0.01803	0.02147	0.02204	0.00431	0.02764	0.01956	0.01676	0.02132	0.00565	1.E-02		4.E-02		9.E-01	
	1369.7329	1369.7328	0.07	0.01020	0.00978	0.00943	0.00981	0.00039	0.00822	0.00821	0.00771	0.00805	0.00029	0.00648	0.00560	0.00683	0.00630	0.00063	3.E-03		1.E-03		1.E-02	
	867.1213	867.1216	0.31	0.02426	0.02651	0.01343	0.02140	0.00699	0.01991	0.02534	0.04915	0.03147	0.01556	0.01403	0.01773	0.02319	0.01832	0.00461	4.E-01		6.E-01		2.E-01	
	809.0916	809.0909	0.87	0.00826	0.00812	0.00441	0.00693	0.00219	0.00698	0.00877	0.01721	0.01099	0.00546	0.00508	0.00708	0.01064	0.00760	0.00282	3.E-01		8.E-01		4.E-01	
	987.5126	987.5132	0.64	0.00963	0.00865	0.00257	0.00695	0.00382	0.00532	0.01037	0.03027	0.01532	0.01319	0.00352	0.00504	0.01033	0.00630	0.00357	4.E-01		8.E-01		3.E-01	
	1075.5650	1075.5642	0.74	0.00475	0.00459	0.00203	0.00379	0.00153	0.00324	0.00548	0.01103	0.00659	0.00401	0.00214	0.00314	0.00508	0.00345	0.00149	3.E-01		8.E-01		3.E-01	
	929.4828	929.4824	0.47	0.00147	0.00153	0.00046	0.00115	0.00060	0.00096	0.00234	0.00733	0.00354	0.00335	0.00085	0.00101	0.00261	0.00149	0.00097	3.E-01		6.E-01		4.E-01	
	1137.2546	1137.2554	0.70	0.00115	0.00104	0.00029	0.00083	0.00046	0.00097	0.00176	0.00504	0.00259	0.00216	0.00042	0.00055	0.00104	0.00067	0.00033	2.E-01		7.E-01		2.E-01	
	1177.6149	1177.6148	0.08	0.00054	0.00063	0.00034	0.00051	0.00015	0.00050	0.00060	0.00121	0.00077	0.00039	0.00000	0.00012	0.00040	0.00018	0.00021	3.E-01		9.E-02		8.E-02	
	1166.6054	1166.6059	0.43	0.00036	0.00027	0.00012	0.00025	0.00012	0.00051	0.00037	0.00086	0.00058	0.00025	0.00028	0.00038	0.00028	0.00031	0.00006	1.E-01		4.E-01		1.E-01	
	1198.1282	1198.1278	0.29	0.00040	0.00048	0.00030	0.00039	0.00009	0.00021	0.00036	0.00080	0.00046	0.00031	0.00015	0.00018	0.00052	0.00028	0.00021	7.E-01		5.E-01		5.E-01	
	988.5204	988.5196	0.81	0.00021	0.00040	0.00011	0.00024	0.00015	0.00019	0.00023	0.00113	0.00052	0.00053	0.00011	0.00017	0.00025	0.00018	0.00007	4.E-01		5.E-01		3.E-01	
	1257.6458	1257.6468	0.77	0.00006	0.00004	0.00001	0.00004	0.00002	0.00004	0.00011	0.00063	0.00026	0.00032	0.00001	0.00001	0.00007	0.00003	0.00003	3.E-01		8.E-01		3.E-01	
	1065.5494	1065.5432	5.79	0.00000	0.00005	0.00010	0.00005	0.00005	0.00007	0.00037	0.00000	0.00015	0.00019	0.00010	0.00087	0.00000	0.00032	0.00048	5.E-01		4.E-01		6.E-01	

N-glycan	Theoretical m/z	Observed m/z	Mass Accuracy (ppm)	DMEM_1	DMEM_2	DMEM_3	Avg	StdV	EMEM_1	EMEM_2	EMEM_3	Avg	StdV	Plasmax_1	Plasmax_2	Plasmax_3	Avg	StdV	P value		P value		P value	
																			DMEM	EMEM	DMEM	Plasmax	EMEM	Plasmax
	1079.2249	1079.2255	0.59	0.00002	0.00003	0.00001	0.00002	0.00001	0.00004	0.00008	0.00022	0.00012	0.00009	0.00002	0.00000	0.00006	0.00003	0.00003	2.E-01		8.E-01		2.E-01	
	1090.5703	1090.5707	0.37	0.00016	0.00021	0.00007	0.00015	0.00007	0.00014	0.00026	0.00048	0.00029	0.00017	0.00000	0.00015	0.00022	0.00012	0.00011	3.E-01		8.E-01		2.E-01	
	1016.8634	1016.8635	0.13	0.00046	0.00044	0.00031	0.00040	0.00008	0.00049	0.00056	0.00121	0.00075	0.00040	0.00019	0.00036	0.00028	0.00028	0.00009	2.E-01		1.E-01		1.E-01	
	948.8301	948.8303	0.21	0.00001	0.00003	0.00000	0.00001	0.00001	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00002	0.00004	0.00002	0.00002	2.E-01		6.E-01		1.E-01	
	853.4458	853.4468	1.13	0.00000	0.00000	0.00000	0.00000	0.00000	0.00015	0.00000	0.00006	0.00007	0.00007	0.00000	0.00001	0.00004	0.00002	0.00002	2.E-01		2.E-01		3.E-01	
	958.8336	958.8334	0.24	0.00000	0.00000	0.00000	0.00000	0.00000	0.00003	0.00005	0.00009	0.00006	0.00003	0.00003	0.00004	0.00005	0.00004	0.00001	3.E-02		7.E-04		4.E-01	
	1286.9966	1286.9981	1.14	0.00000	0.00000	0.00000	0.00000	0.00000	0.00002	0.00002	0.00006	0.00004	0.00002	0.00001	0.00000	0.00002	0.00001	0.00001	7.E-02		2.E-01		1.E-01	
	1069.2213	1069.2228	1.37	0.00002	0.00001	0.00000	0.00001	0.00001	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	2.E-01		2.E-01		-	
	1146.0863	1146.0882	1.66	0.00002	0.00001	0.00000	0.00001	0.00001	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	2.E-01		2.E-01		-	
	962.5056	962.5058	0.21	0.00002	0.00000	0.00001	0.00001	0.00001	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	2.E-01		2.E-01		-	
	1320.6913	1320.6900	0.98	0.00006	0.00004	0.00000	0.00003	0.00003	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	1.E-01		1.E-01		-	
	983.1808	983.1754	5.49	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00001	0.00002	0.00000	0.00001	0.00001	-		1.E-01		1.E-01	
	1074.8931	1074.8876	5.12	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00002	0.00001	0.00001	0.00001	-		1.E-01		1.E-01	
	1123.5791	1123.5732	5.25	0.00000	0.00000	0.00000	0.00000	0.00000	0.00002	0.00001	0.00000	0.00001	0.00001	0.00000	0.00000	0.00000	0.00000	0.00000	1.E-01		-		1.E-01	
	1339.7223	1339.7212	0.82	0.29531	0.28459	0.32425	0.30139	0.02051	0.38400	0.37973	0.33742	0.36705	0.02575	0.22729	0.24679	0.23455	0.23621	0.00986	3.E-02		8.E-03		1.E-03	
	915.4914	915.4902	1.31	0.11912	0.11270	0.08856	0.10679	0.01611	0.09842	0.09476	0.08015	0.09111	0.00967	0.14314	0.17611	0.13621	0.15182	0.02132	2.E-01		4.E-02		1.E-02	
	792.9283	792.9270	1.58	0.07048	0.07274	0.07440	0.07254	0.00197	0.03118	0.04154	0.04207	0.03827	0.00614	0.06719	0.08499	0.06948	0.07389	0.00968	8.E-04		8.E-01		6.E-03	
	1038.0546	1038.0542	0.34	0.02775	0.03145	0.03265	0.03062	0.00255	0.03108	0.02551	0.02251	0.02637	0.00435	0.03888	0.04873	0.04442	0.04401	0.00494	2.E-01		1.E-02		1.E-02	
	1160.6177	1160.6165	1.03	0.01661	0.01621	0.01846	0.01709	0.00120	0.01147	0.00976	0.00777	0.00967	0.00185	0.02605	0.03423	0.02885	0.02971	0.00416	4.E-03		7.E-03		2.E-03	
	1119.5912	1119.5897	1.34	0.02423	0.02438	0.02424	0.02428	0.00009	0.02026	0.01492	0.01659	0.01726	0.00273	0.01133	0.01337	0.01181	0.01217	0.00107	1.E-02		4.E-05		4.E-02	
	1017.5413	1017.5414	0.10	0.01340	0.01310	0.01411	0.01354	0.00052	0.00821	0.00744	0.00723	0.00763	0.00052	0.00682	0.00849	0.00746	0.00759	0.00084	2.E-04		5.E-04		1.E+00	













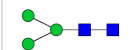
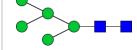











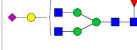






N-glycan	Theoretical m/z	Observed m/z	Mass Accuracy (ppm)	DMEM_1	DMEM_2	DMEM_3	Avg	StdV	EMEM_1	EMEM_2	EMEM_3	Avg	StdV	Plasmax_1	Plasmax_2	Plasmax_3	Avg	StdV	P value		P value		P value	
																			DMEM	EMEM	DMEM	Plasmax	EMEM	Plasmax
	894.9782	894.9777	0.50	0.00914	0.00845	0.00974	0.00911	0.00065	0.00572	0.00809	0.00848	0.00743	0.00149	0.00408	0.00509	0.00377	0.00432	0.00069	1.E-01		9.E-04		3.E-02	
	997.0281	997.0266	1.45	0.00300	0.00289	0.00325	0.00305	0.00018	0.00200	0.00185	0.00179	0.00188	0.00011	0.00169	0.00222	0.00193	0.00195	0.00026	7.E-04		4.E-03		7.E-01	
	896.4721	896.4724	0.30	0.00026	0.00034	0.00000	0.00020	0.00018	0.00033	0.00011	0.00017	0.00020	0.00011	0.00020	0.00031	0.00012	0.00021	0.00009	1.E+00		9.E-01		9.E-01	
	1140.1045	1140.1035	0.83	0.00022	0.00023	0.00025	0.00023	0.00001	0.00022	0.00026	0.00017	0.00022	0.00004	0.00008	0.00024	0.00017	0.00016	0.00008	5.E-01		2.E-01		3.E-01	
	1206.6358	1206.6353	0.41	0.00007	0.00000	0.00004	0.00004	0.00004	0.00009	0.00004	0.00007	0.00007	0.00002	0.00014	0.00006	0.00006	0.00009	0.00004	3.E-01		2.E-01		6.E-01	
	1046.2142	1046.2155	1.27	0.00070	0.00051	0.00051	0.00057	0.00011	0.00118	0.00044	0.00039	0.00067	0.00044	0.00070	0.00087	0.00024	0.00061	0.00033	7.E-01		9.E-01		9.E-01	
	705.8837	705.8820	2.34	0.06007	0.05100	0.05307	0.05471	0.00476	0.01052	0.01000	0.00873	0.00975	0.00092	0.04991	0.04665	0.04149	0.04602	0.00425	9.E-05		8.E-02		1.E-04	
	828.4468	828.4458	1.17	0.02438	0.02011	0.02135	0.02195	0.00220	0.01105	0.00946	0.00988	0.01013	0.00083	0.02145	0.01998	0.01762	0.01968	0.00193	1.E-03		3.E-01		1.E-03	
	807.9336	807.9330	0.68	0.00269	0.00253	0.00288	0.00270	0.00018	0.00318	0.00344	0.00340	0.00334	0.00014	0.00256	0.00256	0.00260	0.00257	0.00003	8.E-03		3.E-01		8.E-04	
	951.0100	951.0090	1.00	0.00244	0.00225	0.00210	0.00226	0.00017	0.00237	0.00171	0.00166	0.00191	0.00040	0.00189	0.00276	0.00239	0.00235	0.00044	2.E-01		8.E-01		3.E-01	
	930.4967	930.4959	0.86	0.00272	0.00263	0.00289	0.00275	0.00013	0.00198	0.00181	0.00158	0.00179	0.00020	0.00173	0.00193	0.00200	0.00188	0.00014	2.E-03		2.E-03		5.E-01	
	909.9835	909.9858	2.58	0.00000	0.00000	0.00000	0.00000	0.00000	0.00004	0.00000	0.00005	0.00003	0.00003	0.00000	0.00000	0.00000	0.00000	0.00000	1.E-01		-		1.E-01	



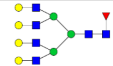






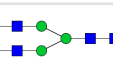


Table S3B. Relative abundance of *O*-glycans from 231BR cell line.

HexNac-Hex-deHex-NeuAc	Theoretical m/z	Observed m/z	Mass Accuracy (ppm)	DMEM_1	DMEM_2	DMEM_3	Avg	StdV	EMEM_1	EMEM_2	EMEM_3	Avg	StdV	Plasmax_1	Plasmax_2	Plasmax_3	Avg	StdV	P value DMEM EMEM	P value DMEM Plasmax	P value EMEM Plasmax
1-1-0-0	496.2759	496.2747	2.42	0.14092	0.12548	0.13383	0.13341	0.00773	0.20084	0.07218	0.14972	0.14091	0.06478	0.18388	0.10796	0.11889	0.13691	0.04105	9.E-01	9.E-01	9.E-01
1-1-0-1	857.4496	857.4486	1.17	0.05241	0.08641	0.07308	0.07063	0.01713	0.00000	0.00000	0.00000	0.00000	0.00000	0.04649	0.04676	0.04153	0.04493	0.00294	2.E-03	6.E-02	1.E-05
1-1-0-2	1218.6233	1218.6225	0.66	0.04644	0.05116	0.06372	0.05377	0.00893	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	5.E-04	5.E-04	-
1-1-1-0	670.3651	670.3642	1.34	0.11051	0.14842	0.16353	0.14082	0.02731	0.03552	0.02231	0.07429	0.04404	0.02702	0.10567	0.07384	0.11256	0.09736	0.02065	1.E-02	9.E-02	5.E-02
2-0-0-1	898.4761	898.4751	1.11	0.00000	0.00000	0.00000	0.00000	0.00000	0.06087	0.02981	0.01732	0.03600	0.02243	0.00724	0.00347	0.00593	0.00555	0.00191	5.E-02	7.E-03	8.E-02
2-0-1-1	1072.5653	1072.5597	5.22	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.07636	0.10316	0.14077	0.10676	0.03236	-	5.E-03	5.E-03
2-2-0-1	1306.6757	1306.6798	3.14	0.00499	0.00332	0.00314	0.00382	0.00102	0.00000	0.00000	0.00000	0.00000	0.00000	0.00441	0.00576	0.00401	0.00473	0.00092	3.E-03	3.E-01	9.E-04
2-2-0-2	834.4287	834.4326	4.73	0.08357	0.06962	0.05435	0.06918	0.01461	0.04803	0.09475	0.07836	0.07372	0.02370	0.08464	0.07477	0.06285	0.07409	0.01091	8.E-01	7.E-01	1.E+00
2-3-0-0	1149.6018	1149.6000	1.57	0.00000	0.00000	0.00000	0.00000	0.00000	0.04209	0.04229	0.15751	0.08063	0.06658	0.00000	0.00000	0.00000	0.00000	0.00000	1.E-01	-	1.E-01
2-3-1-0	1323.6910	1323.6919	0.68	0.00000	0.00000	0.00000	0.00000	0.00000	0.01602	0.01191	0.00723	0.01172	0.00440	0.00000	0.00000	0.00000	0.00000	0.00000	1.E-02	-	1.E-02
2-5-0-3	1321.1652	1321.1639	0.98	0.00430	0.00256	0.00405	0.00364	0.00094	0.00000	0.00000	0.00000	0.00000	0.00000	0.00299	0.00453	0.00403	0.00385	0.00078	3.E-03	8.E-01	1.E-03
2-6-0-0	881.4546	881.4527	2.10	0.01366	0.02731	0.03049	0.02382	0.00894	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	1.E-02	1.E-02	-
2-7-0-0	983.5045	983.5031	1.37	0.02693	0.03611	0.01996	0.02767	0.00810	0.01045	0.02830	0.02928	0.02268	0.01060	0.00000	0.00000	0.00000	0.00000	0.00000	6.E-01	4.E-03	2.E-02
2-8-0-0	1085.5544	1085.5535	0.78	0.06827	0.05631	0.03627	0.05362	0.01617	0.03719	0.06182	0.09174	0.06359	0.02732	0.03950	0.02322	0.03930	0.03401	0.00934	6.E-01	1.E-01	2.E-01
2-9-0-0	1187.6043	1187.6030	1.05	0.04799	0.03670	0.03780	0.04083	0.00622	0.02435	0.04250	0.07544	0.04743	0.02590	0.02591	0.02480	0.03884	0.02985	0.00781	7.E-01	1.E-01	3.E-01
2-10-0-0	1289.6542	1289.6527	1.12	0.00718	0.00602	0.00700	0.00673	0.00062	0.00000	0.00000	0.00000	0.00000	0.00000	0.00130	0.00112	0.00068	0.00104	0.00032	5.E-05	1.E-04	5.E-03
3-1-0-0	986.5285	986.5230	5.58	0.01027	0.00872	0.01107	0.01002	0.00120	0.00000	0.00000	0.00000	0.00000	0.00000	0.01181	0.00567	0.00214	0.00654	0.00489	1.E-04	3.E-01	8.E-02
3-2-1-0	1364.7175	1364.7095	5.86	0.03933	0.01608	0.02063	0.02535	0.01232	0.00000	0.00000	0.00000	0.00000	0.00000	0.06074	0.02659	0.03823	0.04185	0.01736	2.E-02	3.E-01	1.E-02
3-3-2-2	1233.1309	1233.1272	3.00	0.27838	0.22305	0.26468	0.25537	0.02882	0.44900	0.48766	0.24433	0.39366	0.13076	0.28405	0.37090	0.30358	0.31951	0.04557	1.E-01	1.E-01	4.E-01
3-4-1-1	1067.5494	1067.5485	0.80	0.00739	0.02083	0.01060	0.01294	0.00702	0.00260	0.00473	0.01322	0.00685	0.00562	0.00191	0.00200	0.00296	0.00229	0.00058	3.E-01	6.E-02	2.E-01
5-5-0-0	1147.0941	1147.0884	4.97	0.00654	0.00301	0.00250	0.00402	0.00220	0.00118	0.00307	0.00536	0.00320	0.00209	0.00218	0.00181	0.00361	0.00253	0.00095	7.E-01	3.E-01	6.E-01
5-6-0-0	1249.1440	1249.1406	2.72	0.00000	0.00000	0.00000	0.00000	0.00000	0.00176	0.00242	0.00352	0.00257	0.00089	0.00604	0.00465	0.00773	0.00614	0.00154	7.E-03	2.E-03	3.E-02
5-6-2-0	949.1581	949.1601	2.11	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00146	0.00184	0.00150	0.00160	0.00021	-	2.E-04	2.E-04
6-5-0-0	1269.6573	1269.6597	1.93	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00007	0.00159	0.00044	0.00070	0.00079	-	2.E-01	2.E-01
6-5-0-1	967.1654	967.1700	4.79	0.00615	0.00646	0.00629	0.00630	0.00016	0.00000	0.00000	0.00000	0.00000	0.00000	0.00791	0.01602	0.00822	0.01072	0.00459	3.E-07	2.E-01	2.E-02
6-5-1-0	904.8039	904.8074	3.91	0.03803	0.04609	0.04800	0.04404	0.00529	0.05844	0.08655	0.03513	0.06004	0.02575	0.03762	0.08329	0.05405	0.05832	0.02313	4.E-01	4.E-01	9.E-01
6-6-1-0	972.8371	972.8339	3.32	0.00671	0.02633	0.00899	0.01401	0.01073	0.01166	0.00969	0.01756	0.01297	0.00409	0.00783	0.01622	0.00816	0.01073	0.00475	9.E-01	7.E-01	6.E-01

**Table S4A.** Relative abundance of *N*-glycans from CRL cell line.

N-glycan	Theoretical m/z	Observed m/z	Mass Accuracy (ppm)	DMEM_1	DMEM_2	DMEM_3	Avg	StdV	EMEM_1	EMEM_2	EMEM_3	Avg	StdV	Plasmax_1	Plasmax_2	Plasmax_3	Avg	StdV	P value DMEM EMEM		P value DMEM Plasmax		P value EMEM Plasmax	
	1165.6331	1165.6291	3.43	0.21055	0.18422	0.21313	0.20263	0.01599	0.17248	0.19654	0.16777	0.17893	0.01543	0.16628	0.18673	0.20616	0.18639	0.01994	1.E-01		3.E-01		6.E-01	
	787.4203	787.4170	4.19	0.09155	0.08322	0.06792	0.08090	0.01199	0.07327	0.07669	0.08165	0.07720	0.00421	0.09355	0.08259	0.07849	0.08488	0.00778	6.E-01		7.E-01		2.E-01	
	991.5201	991.5171	3.03	0.04261	0.03763	0.04168	0.04064	0.00265	0.04329	0.03566	0.03786	0.03894	0.00393	0.04423	0.04238	0.04119	0.04260	0.00153	6.E-01		3.E-01		2.E-01	
	1369.7329	1369.7280	3.58	0.03597	0.04067	0.02885	0.03516	0.00595	0.01737	0.02186	0.02849	0.02257	0.00559	0.02268	0.02518	0.02763	0.02516	0.00247	6.E-02		5.E-02		5.E-01	
	889.4702	889.4676	2.92	0.10993	0.08923	0.08996	0.09637	0.01175	0.10608	0.10047	0.11217	0.10624	0.00585	0.12566	0.12052	0.10540	0.11719	0.01053	3.E-01		8.E-02		2.E-01	
	1093.5700	1093.5673	2.47	0.03858	0.03745	0.03831	0.03811	0.00059	0.05542	0.04198	0.04021	0.04587	0.00831	0.05115	0.05328	0.04768	0.05070	0.00283	2.E-01		2.E-03		4.E-01	
	1075.5650	1075.5610	3.72	0.01138	0.01282	0.01036	0.01152	0.00123	0.01562	0.01489	0.01394	0.01482	0.00084	0.00967	0.01035	0.00801	0.00934	0.00120	2.E-02		9.E-02		3.E-03	
	948.8301	948.8270	3.27	0.00594	0.00641	0.00699	0.00645	0.00053	0.00694	0.00633	0.00504	0.00610	0.00097	0.00794	0.00932	0.00879	0.00869	0.00070	6.E-01		1.E-02		2.E-02	
	1098.5721	1098.5686	3.22	0.00343	0.00467	0.00455	0.00422	0.00069	0.00215	0.00312	0.00254	0.00261	0.00049	0.00469	0.00585	0.00583	0.00546	0.00067	3.E-02		9.E-02		4.E-03	
	1016.8634	1016.8600	3.31	0.00090	0.00123	0.00113	0.00109	0.00017	0.00249	0.00255	0.00226	0.00243	0.00015	0.00130	0.00170	0.00147	0.00149	0.00020	5.E-04		5.E-02		3.E-03	
	1192.6202	1192.6160	3.52	0.00082	0.00117	0.00112	0.00104	0.00019	0.00083	0.00093	0.00105	0.00094	0.00011	0.00000	0.00086	0.00070	0.00052	0.00046	5.E-01		1.E-01		2.E-01	
	1079.2249	1079.2213	3.30	0.00036	0.00059	0.00052	0.00049	0.00012	0.00117	0.00121	0.00108	0.00116	0.00007	0.00166	0.00257	0.00232	0.00218	0.00047	1.E-03		4.E-03		2.E-02	
	958.8336	958.8307	3.06	0.00000	0.00000	0.00000	0.00000	0.00000	0.00111	0.00119	0.00089	0.00107	0.00015	0.00112	0.00154	0.00126	0.00131	0.00022	3.E-04		5.E-04		2.E-01	
	1199.6161	1199.6127	2.83	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00060	0.00097	0.00078	0.00079	0.00018	-		2.E-03		2.E-03	
	1198.1282	1198.1240	3.46	0.00000	0.00000	0.00000	0.00000	0.00000	0.00096	0.00099	0.00075	0.00090	0.00013	0.00000	0.00000	0.00000	0.00000	0.00000	3.E-04		-		3.E-04	
	1300.1781	1300.1739	3.19	0.01183	0.01454	0.01454	0.01364	0.00157	0.03183	0.03033	0.03108	0.03108	0.00075	0.02673	0.02514	0.02546	0.02578	0.00084	6.E-05		3.E-04		1.E-03	
	1213.1335	1213.1286	4.00	0.00816	0.00979	0.00910	0.00902	0.00082	0.02149	0.02030	0.01932	0.02037	0.00109	0.02082	0.02131	0.01690	0.01967	0.00242	1.E-04		2.E-03		7.E-01	
	988.5204	988.5166	3.84	0.00498	0.00523	0.00427	0.00483	0.00050	0.00944	0.00939	0.00891	0.00925	0.00030	0.00615	0.00794	0.00656	0.00688	0.00093	2.E-04		3.E-02		1.E-02	
	929.4828	929.4794	3.69	0.00188	0.00245	0.00300	0.00244	0.00056	0.00371	0.00344	0.00359	0.00358	0.00013	0.00474	0.00526	0.00446	0.00482	0.00040	3.E-02		4.E-03		7.E-03	
	987.5126	987.5094	3.21	0.00148	0.00194	0.00149	0.00163	0.00026	0.00539	0.00514	0.00476	0.00510	0.00032	0.00500	0.00712	0.00566	0.00593	0.00108	1.E-04		3.E-03		3.E-01	

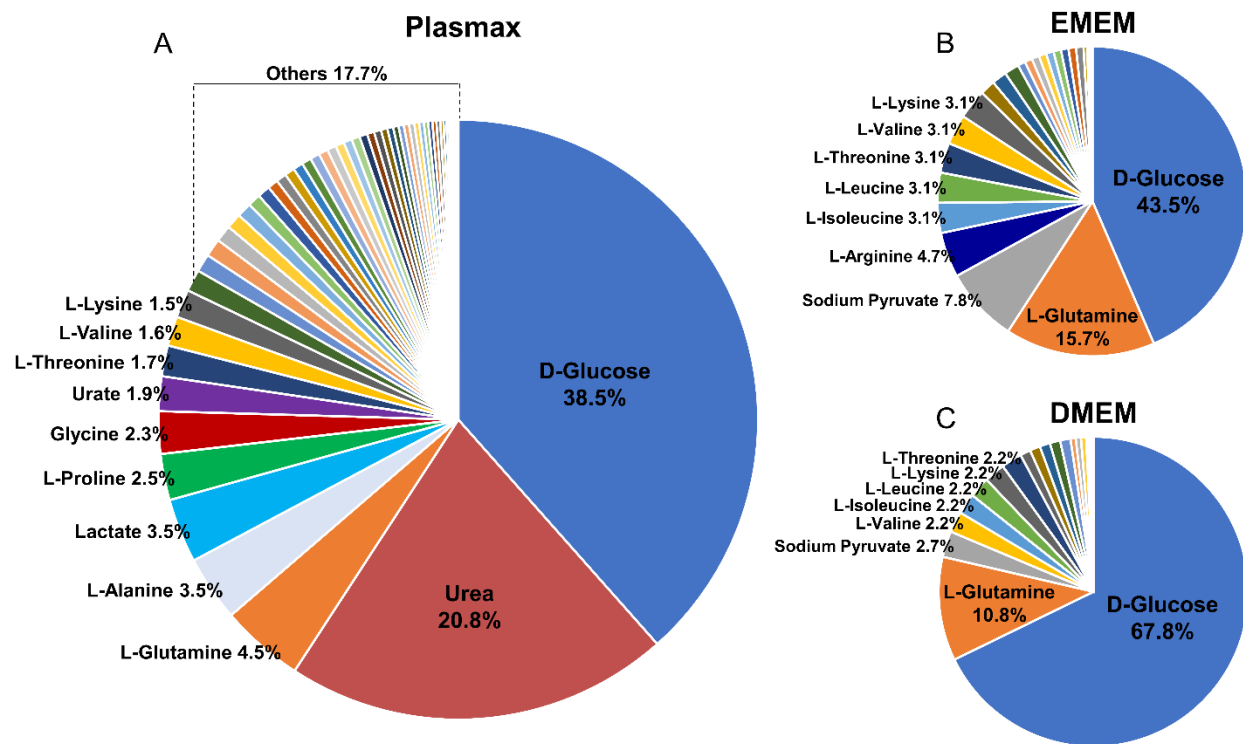
N-glycan	Theoretical m/z	Observed m/z	Mass Accuracy (ppm)	DMEM_1	DMEM_2	DMEM_3	Avg	StdV	EMEM_1	EMEM_2	EMEM_3	Avg	StdV	Plasmax_1	Plasmax_2	Plasmax_3	Avg	StdV	P value		P value		P value	
																			DMEM	EMEM	DMEM	Plasmax	EMEM	Plasmax
	1090.5703	1090.5667	3.30	0.00125	0.00140	0.00098	0.00121	0.00021	0.00160	0.00192	0.00174	0.00175	0.00016	0.00173	0.00177	0.00180	0.00177	0.00003	3.E-02		1.E-02		9.E-01	
	890.8004	890.7973	3.44	0.00106	0.00153	0.00155	0.00138	0.00028	0.00147	0.00136	0.00151	0.00145	0.00008	0.00170	0.00185	0.00195	0.00183	0.00013	7.E-01		6.E-02		1.E-02	
	1137.2546	1137.2505	3.61	0.00047	0.00133	0.00113	0.00098	0.00045	0.00164	0.00172	0.00170	0.00169	0.00004	0.00245	0.00217	0.00269	0.00244	0.00026	5.E-02		8.E-03		8.E-03	
	1040.5424	1040.5392	3.08	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00069	0.00063	0.00044	0.00038	-		1.E-01		1.E-01	
	1339.7223	1339.7176	3.51	0.23384	0.24774	0.25452	0.24537	0.01054	0.12348	0.12649	0.14056	0.13018	0.00912	0.15465	0.15426	0.17760	0.16217	0.01336	1.E-04		1.E-03		3.E-02	
	1242.1544	1242.1496	3.82	0.03353	0.03727	0.04211	0.03764	0.00430	0.02791	0.02208	0.02842	0.02614	0.00353	0.04433	0.03223	0.03641	0.03766	0.00614	2.E-02		1.E+00		5.E-02	
	915.4914	915.4878	3.93	0.01821	0.02321	0.02299	0.02147	0.00282	0.05584	0.05662	0.05456	0.05567	0.00104	0.03683	0.03326	0.03029	0.03346	0.00327	4.E-05		9.E-03		4.E-04	
	1140.1045	1140.0999	3.99	0.01689	0.01943	0.02178	0.01937	0.00245	0.00949	0.00878	0.00877	0.00902	0.00041	0.01862	0.01646	0.01548	0.01685	0.00161	2.E-03		2.E-01		1.E-03	
	792.9283	792.9250	4.10	0.01652	0.02045	0.01932	0.01877	0.00203	0.04517	0.04538	0.04730	0.04595	0.00118	0.01903	0.01891	0.01770	0.01855	0.00073	4.E-05		9.E-01		4.E-06	
	1119.5912	1119.5871	3.66	0.00778	0.00933	0.00920	0.00877	0.00086	0.01919	0.01747	0.01683	0.01783	0.00122	0.01041	0.00270	0.00381	0.00564	0.00417	5.E-04		3.E-01		8.E-03	
	1038.0546	1038.0507	3.71	0.00752	0.00913	0.00875	0.00847	0.00084	0.01451	0.01403	0.01252	0.01369	0.00104	0.01081	0.00913	0.00827	0.00940	0.00129	2.E-03		4.E-01		1.E-02	
	894.9782	894.9747	3.85	0.00649	0.00738	0.00527	0.00638	0.00106	0.00828	0.00853	0.00867	0.00849	0.00020	0.00584	0.00536	0.00499	0.00540	0.00043	3.E-02		2.E-01		3.E-04	
	1017.5413	1017.5377	3.54	0.00278	0.00349	0.00298	0.00308	0.00037	0.01093	0.01047	0.00895	0.01012	0.00104	0.00322	0.00432	0.00332	0.00362	0.00061	4.E-04		3.E-01		7.E-04	
	1160.6177	1160.6134	3.70	0.00235	0.00346	0.00305	0.00295	0.00056	0.00769	0.00799	0.00719	0.00762	0.00040	0.00451	0.00397	0.00367	0.00405	0.00042	3.E-04		5.E-02		4.E-04	
	1262.6676	1262.6631	3.56	0.00091	0.00118	0.00122	0.00111	0.00017	0.00115	0.00137	0.00125	0.00126	0.00011	0.00103	0.00087	0.00069	0.00086	0.00017	3.E-01		2.E-01		3.E-02	
	896.4721	896.4687	3.83	0.00046	0.00053	0.00063	0.00054	0.00008	0.00121	0.00112	0.00114	0.00115	0.00004	0.00000	0.00000	0.00000	0.00000	0.00000	3.E-04		4.E-04		1.E-06	
	997.0281	997.0246	3.46	0.00069	0.00073	0.00048	0.00063	0.00013	0.00071	0.00075	0.00068	0.00071	0.00003	0.00000	0.00000	0.00000	0.00000	0.00000	4.E-01		1.E-03		3.E-06	
	954.5019	954.5021	0.24	0.00065	0.00046	0.00065	0.00059	0.00011	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	7.E-04		7.E-04		-	
	978.1809	978.1783	2.66	0.00218	0.00255	0.00318	0.00264	0.00050	0.00405	0.00365	0.00244	0.00338	0.00084	0.00433	0.00355	0.00342	0.00377	0.00049	3.E-01		5.E-02		5.E-01	
	1221.6411	1221.6424	1.06	0.00122	0.00097	0.00126	0.00115	0.00016	0.00278	0.00201	0.00276	0.00252	0.00044	0.00309	0.00166	0.00122	0.00199	0.00097	7.E-03		2.E-01		4.E-01	
	910.1476	910.1441	3.88	0.00064	0.00094	0.00054	0.00071	0.00021	0.00081	0.00089	0.00066	0.00079	0.00012	0.00071	0.00000	0.00075	0.00049	0.00042	6.E-01		5.E-01		3.E-01	

N-glycan	Theoretical m/z	Observed m/z	Mass Accuracy (ppm)	DMEM_1	DMEM_2	DMEM_3	Avg	StdV	EMEM_1	EMEM_2	EMEM_3	Avg	StdV	Plasmax_1	Plasmax_2	Plasmax_3	Avg	StdV	P value		P value		P value	
																			DMEM	EMEM	DMEM	Plasmax	EMEM	Plasmax
	1046.2142	1046.2102	3.79	0.00052	0.00103	0.00104	0.00086	0.00030	0.00152	0.00160	0.00109	0.00141	0.00027	0.00114	0.00093	0.00104	0.00103	0.00010	8.E-02		4.E-01		9.E-02	
	1053.0599	1053.0561	3.56	0.01212	0.01472	0.01273	0.01319	0.00136	0.00866	0.00760	0.00725	0.00784	0.00074	0.01627	0.01544	0.01318	0.01497	0.00160	4.E-03		2.E-01		2.E-03	
	705.8837	705.8803	4.75	0.00789	0.00829	0.00701	0.00773	0.00066	0.01581	0.01917	0.01895	0.01798	0.00188	0.00727	0.00902	0.00750	0.00793	0.00095	9.E-04		8.E-01		1.E-03	
	828.4468	828.4438	3.62	0.00781	0.00909	0.00817	0.00836	0.00066	0.02188	0.02339	0.02133	0.02220	0.00106	0.01141	0.01375	0.01268	0.01261	0.00117	4.E-05		5.E-03		5.E-04	
	930.4967	930.4923	4.73	0.00223	0.00237	0.00215	0.00225	0.00011	0.00842	0.00880	0.00711	0.00811	0.00088	0.00249	0.00310	0.00259	0.00273	0.00033	3.E-04		7.E-02		6.E-04	
	807.9336	807.9304	3.90	0.00770	0.00871	0.00602	0.00748	0.00136	0.00831	0.00859	0.00787	0.00826	0.00037	0.00533	0.00733	0.00596	0.00621	0.00102	4.E-01		3.E-01		3.E-02	
	1155.1098	1155.1049	4.20	0.00386	0.00279	0.00132	0.00266	0.00128	0.00259	0.00348	0.00260	0.00289	0.00051	0.00488	0.00849	0.00434	0.00591	0.00226	8.E-01		1.E-01		9.E-02	
	951.0100	951.0065	3.63	0.00285	0.00424	0.00153	0.00287	0.00136	0.00575	0.00585	0.00504	0.00555	0.00044	0.00384	0.00424	0.00372	0.00393	0.00027	3.E-02		3.E-01		6.E-03	
	1032.5466	1032.5426	3.87	0.00220	0.00258	0.00223	0.00234	0.00021	0.00161	0.00000	0.00357	0.00173	0.00179	0.00428	0.00406	0.00460	0.00431	0.00027	6.E-01		6.E-04		7.E-02	
	920.1512	920.1477	3.77	0.00103	0.00127	0.00129	0.00120	0.00014	0.00146	0.00151	0.00122	0.00140	0.00015	0.00218	0.00249	0.00219	0.00229	0.00017	2.E-01		1.E-03		3.E-03	

**Table S4B.** Relative abundance of *O*-glycans from CRL cell line.

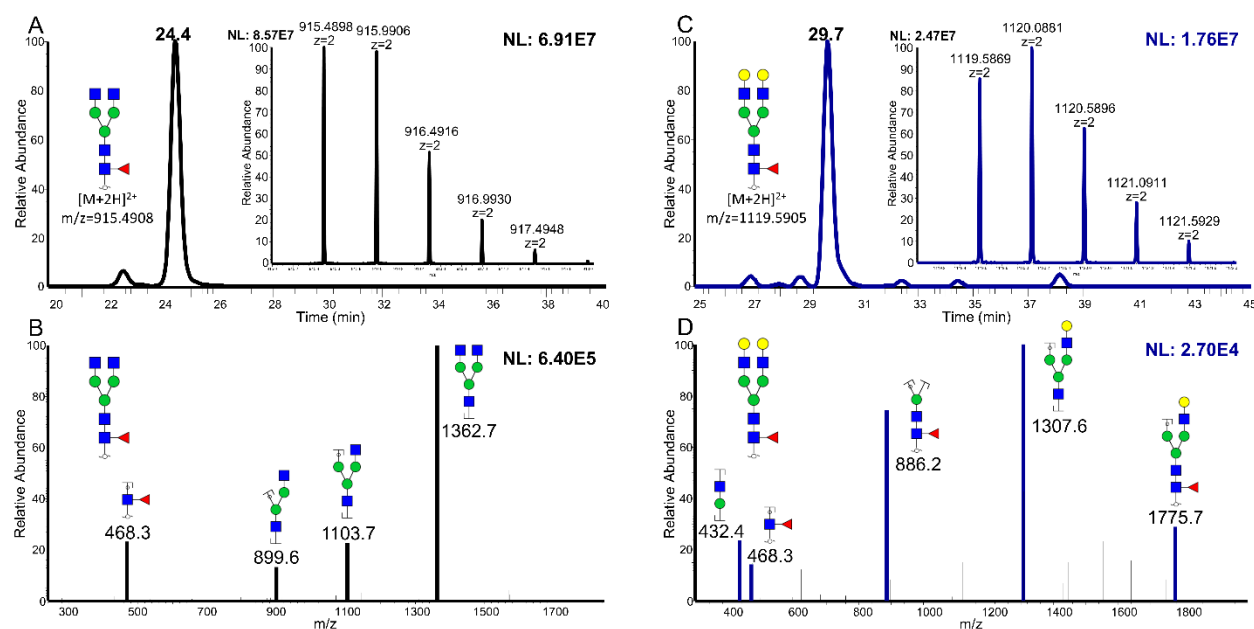
HexNac-Hex-deHex-NeuAc	Theoretical m/z	Observed m/z	Mass Accuracy (ppm)	DMEM_1	DMEM_2	DMEM_3	Avg	StdV	EMEM_1	EMEM_2	EMEM_3	Avg	StdV	Plasmax_1	Plasmax_2	Plasmax_3	Avg	StdV	P value DMEM EMEM	P value DMEM Plasmax	P value EMEM Plasmax
1-1-0-1	857.4496	857.4486	1.17	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.11934	0.07092	0.08655	0.09227	0.02471	-	3.E-03	3.E-03
2-0-1-1	1072.5653	1072.5571	7.65	0.10652	0.04425	0.11048	0.08708	0.03715	0.37118	0.33991	0.32090	0.34400	0.02539	0.09332	0.02185	0.03067	0.04862	0.03897	6.E-04	3.E-01	4.E-04
2-2-0-0	945.5020	945.5003	1.80	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.07376	0.03149	0.02733	0.04419	0.02569	-	4.E-02	4.E-02
2-2-0-2	834.4287	834.4302	1.86	0.11649	0.11144	0.09427	0.10740	0.01164	0.07308	0.09308	0.16299	0.10972	0.04721	0.14829	0.09584	0.11341	0.11918	0.02670	9.E-01	5.E-01	8.E-01
2-3-0-1	755.8917	755.8985	9.00	0.00000	0.00000	0.00000	0.00000	0.00000	0.13479	0.09992	0.14667	0.12713	0.02430	0.00000	0.00000	0.00000	0.00000	0.00000	8.E-04	-	8.E-04
2-4-0-3	1219.1153	1219.1103	4.10	0.01152	0.00925	0.00956	0.01011	0.00123	0.00000	0.00000	0.00000	0.00000	0.00000	0.01196	0.01667	0.01286	0.01383	0.00250	1.E-04	8.E-02	7.E-04
2-4-3-2	1299.6623	1299.6696	5.66	0.00209	0.00409	0.00190	0.00269	0.00121	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	2.E-02	2.E-02	-
2-5-0-3	1321.1652	1321.1607	3.41	0.01505	0.01350	0.01747	0.01534	0.00200	0.00000	0.00000	0.00000	0.00000	0.00000	0.00704	0.01043	0.00965	0.00904	0.00178	2.E-04	2.E-02	9.E-04
2-5-1-2	1227.6230	1227.6227	0.20	0.01076	0.01717	0.00629	0.01141	0.00547	0.00000	0.00000	0.00000	0.00000	0.00000	0.01134	0.01526	0.01138	0.01266	0.00225	2.E-02	7.E-01	6.E-04
2-5-3-0	1040.5385	1040.5296	8.51	0.01718	0.01381	0.01593	0.01564	0.00170	0.00839	0.00880	0.01233	0.00984	0.00217	0.00957	0.00900	0.00475	0.00777	0.00264	2.E-02	1.E-02	4.E-01
2-6-0-0	881.4546	881.4550	0.51	0.04208	0.05225	0.03547	0.04327	0.00846	0.00000	0.00000	0.00000	0.00000	0.00000	0.05210	0.06255	0.02096	0.04520	0.02163	9.E-04	9.E-01	2.E-02
2-7-0-0	983.5045	983.5003	4.22	0.07074	0.09787	0.06330	0.07730	0.01820	0.00000	0.00000	0.00000	0.00000	0.00000	0.05895	0.09481	0.06823	0.07400	0.01861	2.E-03	8.E-01	2.E-03
2-8-0-0	1085.5544	1085.5504	3.64	0.14158	0.19399	0.15193	0.16250	0.02776	0.09054	0.10621	0.06935	0.08870	0.01850	0.11576	0.19044	0.17486	0.16035	0.03939	2.E-02	9.E-01	5.E-02
2-9-0-0	1187.6043	1187.5997	3.83	0.09194	0.11829	0.11604	0.10876	0.01461	0.06618	0.08794	0.04565	0.06659	0.02115	0.05644	0.09409	0.10082	0.08378	0.02391	5.E-02	2.E-01	4.E-01
2-10-0-0	1289.6542	1289.6502	3.06	0.02075	0.02228	0.02539	0.02281	0.00236	0.00000	0.00000	0.00000	0.00000	0.00000	0.01053	0.01993	0.01168	0.01405	0.00513	8.E-05	5.E-02	9.E-03
3-1-2-2	1029.0311	1029.0233	7.58	0.01224	0.00866	0.00962	0.01018	0.00185	0.00000	0.00000	0.00000	0.00000	0.00000	0.00848	0.00358	0.00000	0.00402	0.00425	7.E-04	8.E-02	2.E-01
3-3-1-1	965.4995	965.4937	5.96	0.04284	0.05107	0.03954	0.04448	0.00594	0.00000	0.00000	0.00000	0.00000	0.00000	0.00880	0.02624	0.01890	0.01798	0.00875	2.E-04	1.E-02	2.E-02
3-3-1-3	1326.6732	1326.6718	1.02	0.01909	0.01139	0.01911	0.01653	0.00445	0.01878	0.01678	0.01341	0.01632	0.00271	0.00000	0.00000	0.00000	0.00000	0.00000	9.E-01	3.E-03	5.E-04
3-3-2-2	1233.1309	1233.1227	6.65	0.03943	0.02948	0.03357	0.03416	0.00500	0.03478	0.03209	0.02517	0.03068	0.00496	0.01972	0.02283	0.02229	0.02161	0.00166	4.E-01	1.E-02	4.E-02
3-4-1-1	1067.5494	1067.5441	4.92	0.03319	0.01316	0.02023	0.02219	0.01016	0.01487	0.03276	0.02275	0.02346	0.00897	0.01281	0.03787	0.03338	0.02802	0.01336	9.E-01	6.E-01	6.E-01
3-5-1-1	1169.5993	1169.5921	6.11	0.01417	0.01931	0.01861	0.01736	0.00279	0.00767	0.00910	0.01123	0.00933	0.00179	0.00566	0.01422	0.01581	0.01190	0.00546	1.E-02	2.E-01	5.E-01
4-4-0-3	976.4970	976.4917	5.46	0.00654	0.00627	0.00899	0.00727	0.00150	0.01246	0.00780	0.00704	0.00910	0.00294	0.00225	0.00412	0.00994	0.00544	0.00401	4.E-01	5.E-01	3.E-01
4-9-0-0	955.4897	955.4866	3.21	0.00445	0.00503	0.00846	0.00598	0.00217	0.00000	0.00000	0.00000	0.00000	0.00000	0.00330	0.00439	0.01799	0.00856	0.00818	9.E-03	6.E-01	1.E-01
5-5-0-1	1327.6810	1327.6714	7.19	0.00306	0.00551	0.00223	0.00360	0.00171	0.00308	0.00587	0.00395	0.00430	0.00143	0.00199	0.00233	0.00320	0.00250	0.00062	6.E-01	4.E-01	1.E-01
5-5-1-0	1234.1387	1234.1275	9.08	0.00489	0.00518	0.00620	0.00542	0.00069	0.00000	0.00000	0.00000	0.00000	0.00000	0.00548	0.00434	0.00407	0.00463	0.00075	2.E-04	2.E-01	4.E-04
6-3-1-0	1152.6021	1152.5974	4.03	0.02459	0.02037	0.02539	0.02345	0.00269	0.02755	0.03101	0.02480	0.02779	0.00311	0.01279	0.01514	0.00948	0.01247	0.00284	1.E-01	8.E-03	3.E-03
6-4-0-1	1348.1942	1348.1842	7.42	0.04674	0.04763	0.05414	0.04950	0.00404	0.03001	0.02480	0.02849	0.02777	0.00268	0.01008	0.00763	0.00951	0.00907	0.00128	1.E-03	8.E-05	4.E-04
6-4-1-0	1254.6520	1254.6478	3.31	0.05771	0.04319	0.05420	0.05170	0.00758	0.05257	0.05474	0.04422	0.05051	0.00555	0.02869	0.03563	0.03797	0.03410	0.00483	8.E-01	3.E-02	2.E-02
6-5-0-1	967.1654	967.1707	5.51	0.01670	0.01543	0.01914	0.01709	0.00189	0.02057	0.02015	0.01295	0.01789	0.00428	0.10971	0.08623	0.13941	0.11178	0.02665	8.E-01	4.E-03	4.E-03
6-5-1-0	904.8039	904.8009	3.28	0.02640	0.01808	0.03041	0.02496	0.00629	0.03049	0.02557	0.04500	0.03369	0.01010	0.00000	0.00000	0.00000	0.00000	0.00000	3.E-01	2.E-03	4.E-03
6-6-0-1	1035.1986	1035.1938	4.67	0.00127	0.00205	0.00212	0.00181	0.00047	0.00298	0.00348	0.00311	0.00319	0.00026	0.00185	0.00218	0.00491	0.00298	0.00168	1.E-02	3.E-01	8.E-01

**Figure S1**



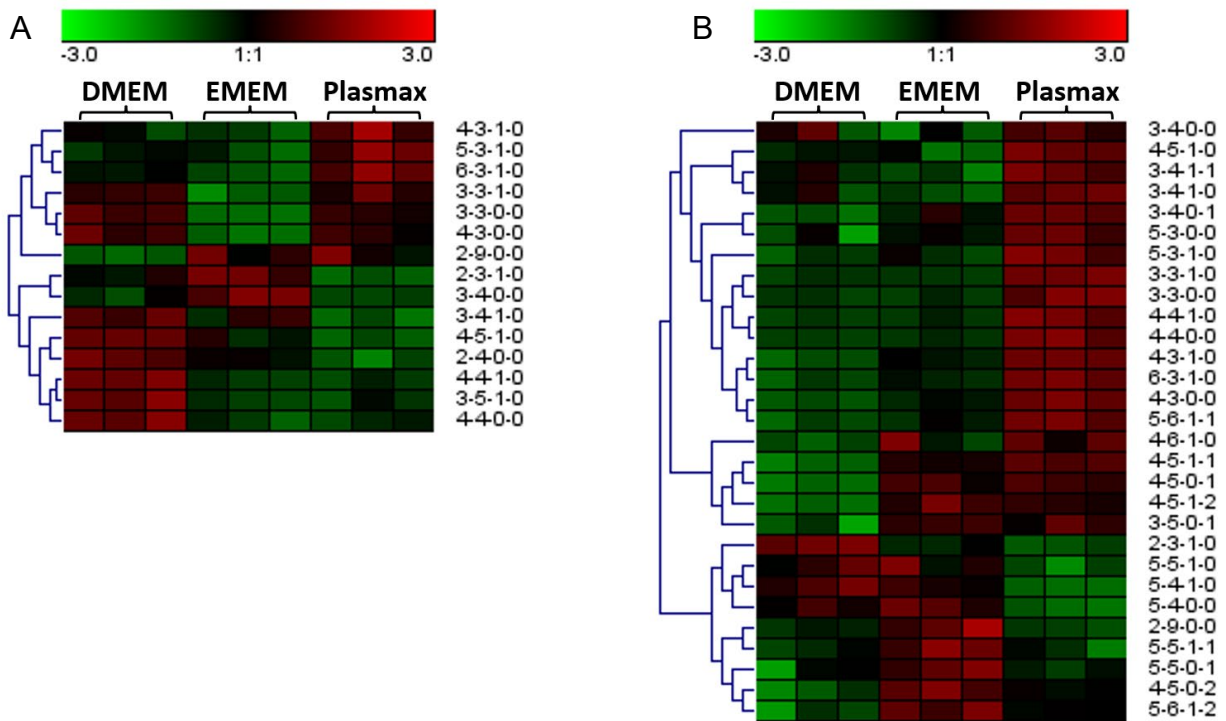
**Figure S1.** Nutritional composition of three media: **(A)** Plasmax, **(B)** EMEM, and **(C)** DMEM.

**Figure S2**



**Figure S2.** Examples of positional structural identification method of (A) *N*-glycan HexNAc<sub>4</sub>Hex<sub>3</sub>DeoxyHex<sub>1</sub> from 231BR cell line and (C) *N*-glycan HexNAc<sub>4</sub>Hex<sub>5</sub>DeoxyHex<sub>1</sub> from CRL cell line using LC-MS/MS. Insets of (A) and (C) are the full MS spectra, (B) and (D) are MS/MS spectra with identified fragment ions assigned to corresponding peaks. Symbols: ■, N-acetylglucosamine (GlcNAc); ●, Galactose (Gal); ▼, Fucose (Fuc); ●, Mannose (Man).

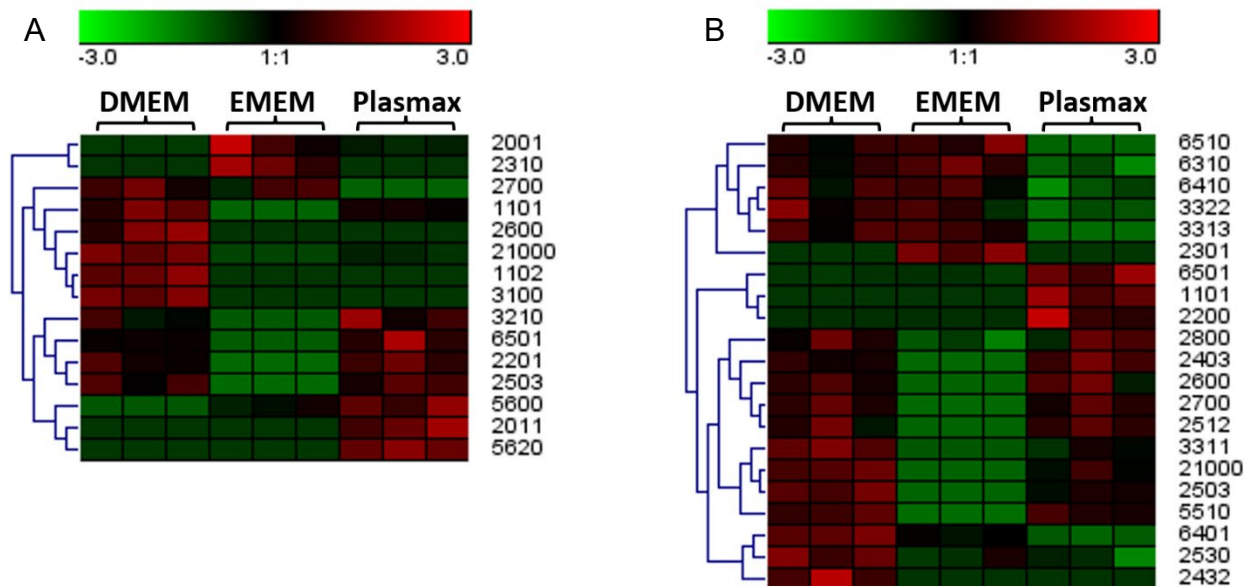
**Figure S3**



**Figure S3.** Heatmaps of significant *N*-glycans from **(A)** 231BR cell line and **(B)** CRL cell line. Red color denotes up-regulation, green color denotes down-regulation.

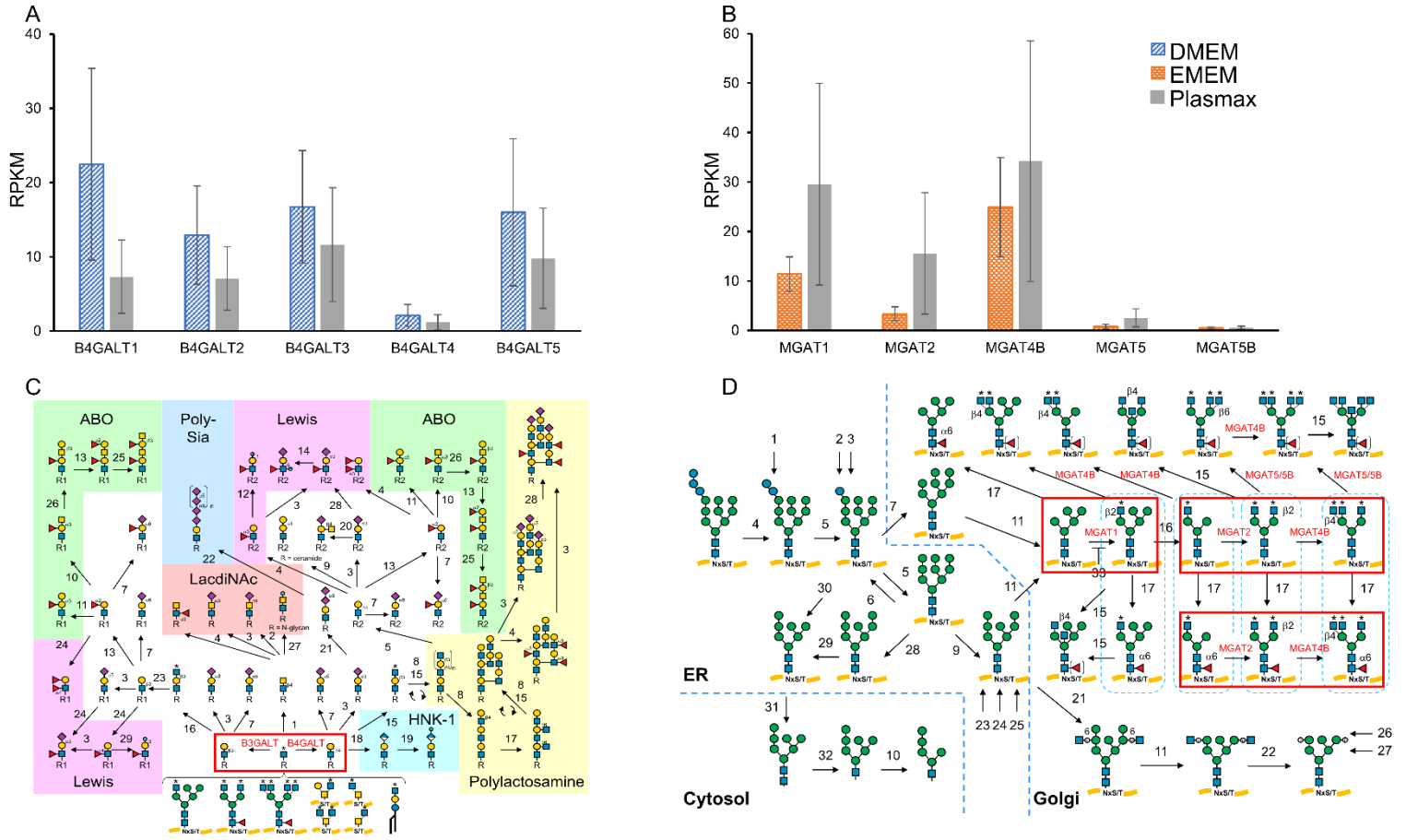


Figure S4



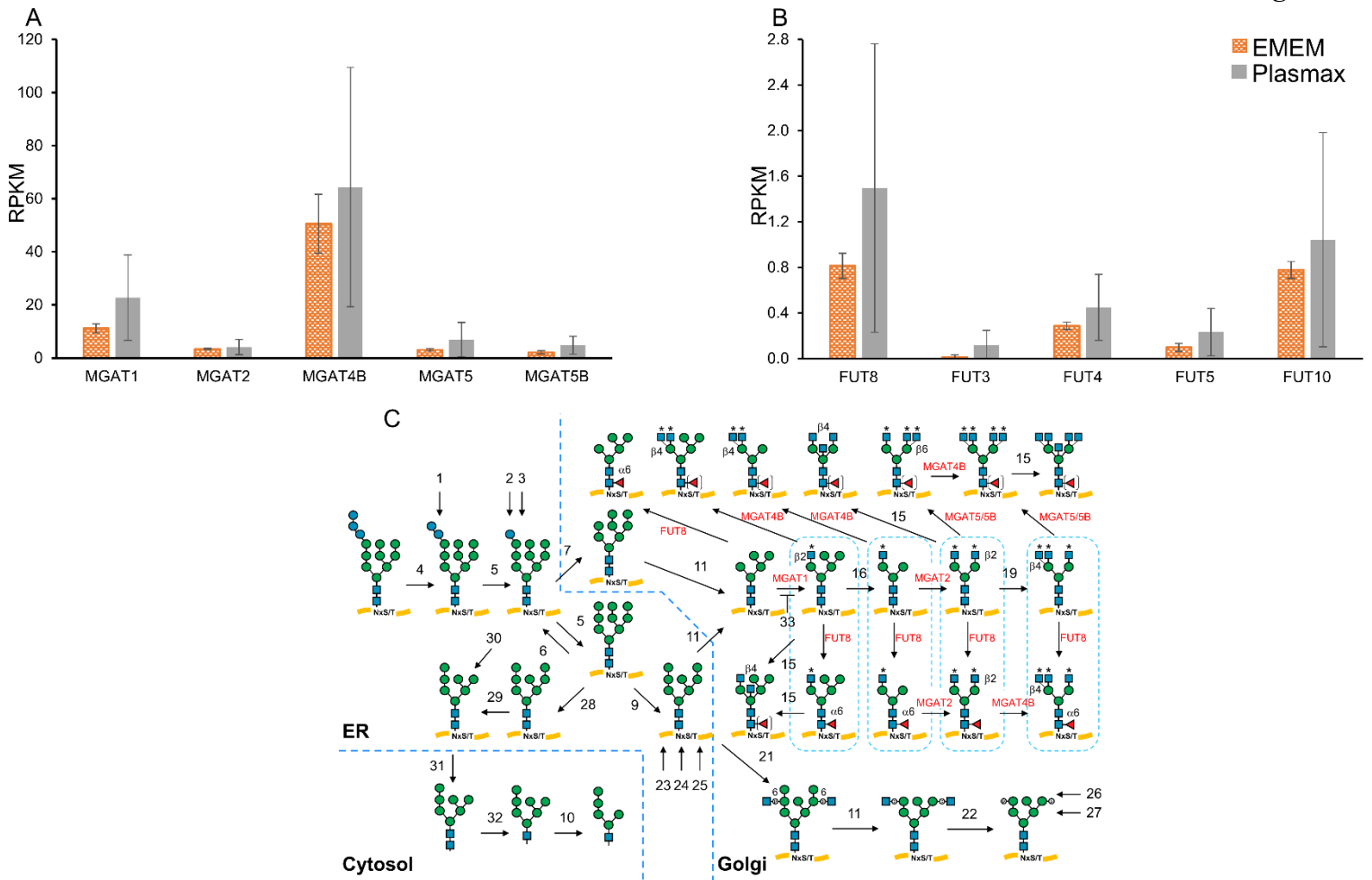
**Figure S4.** Heatmaps of significant *O*-glycans from (A) 231BR cell line and (B) CRL cell line. Red color denotes up-regulation, green color denotes down-regulation.

Figure S5



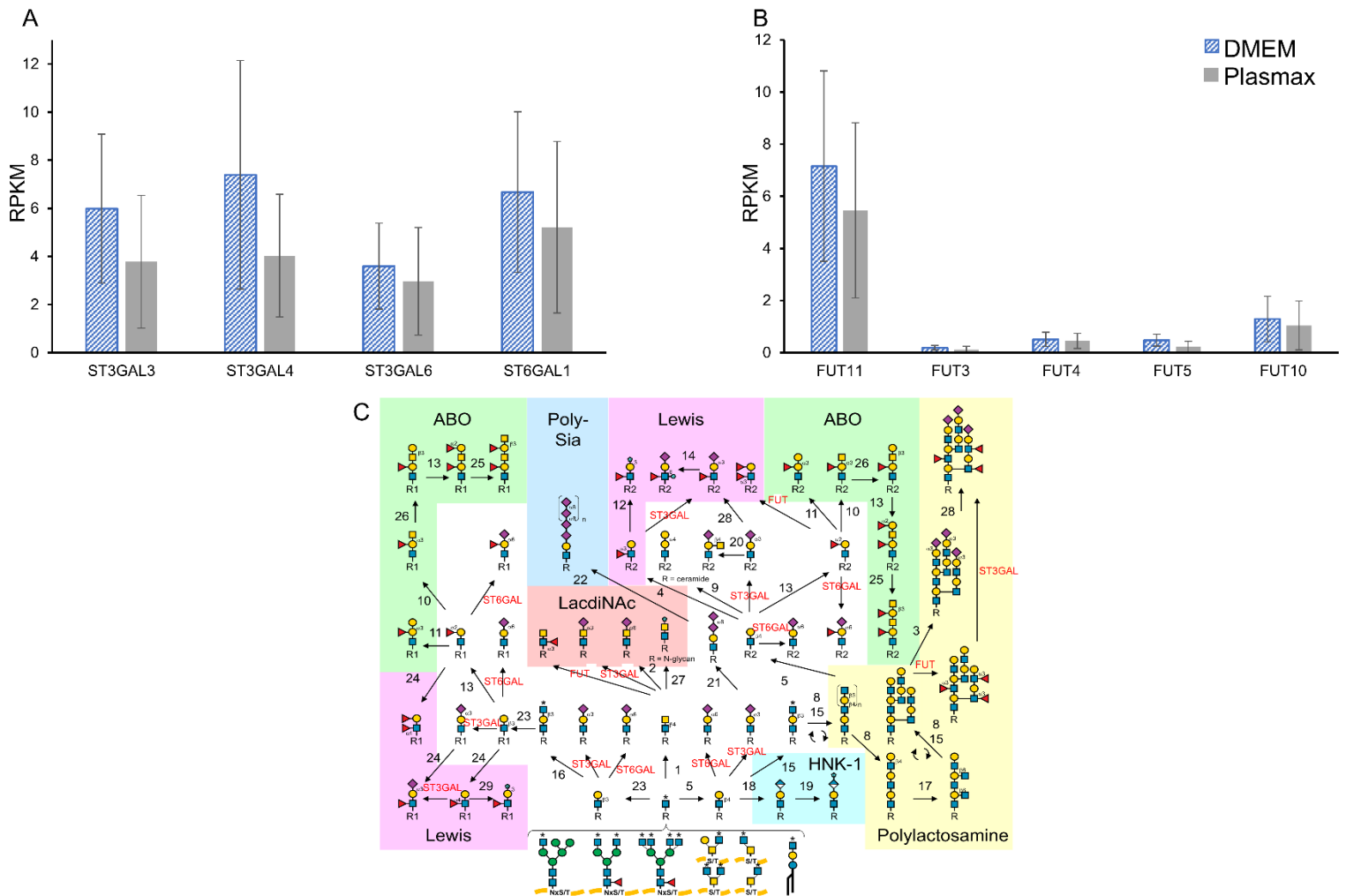
**Figure S5.** Transcript expressions of 231BR cell line. **(A)** Galactosyltransferases in DMEM and Plasmax; **(B)** *N*-acetylglucosaminyltransferases in EMEM and Plasmax. **(C)** Synthesis pathways of complex capping *N*- and *O*-glycans. The red box highlights the processes of connecting galactose to GlcNAc, catalyzed by B4GALT/B3GALT. **(D)** Synthesis pathways of *N*-glycan processing and branching. Red boxes highlight the processes of attaching GlcNAc to mannose on core structure, catalyzed by MGATs. The synthesis pathways are acquired from GlycoMaple (<https://glycosmos.org/glycomaple/index>).

**Figure S6**



**Figure S6.** Transcript expressions of CRL cell line. **(A)** *N*-acetylglucosaminyltransferases in EMEM and Plasmax; **(B)** Fucosyltransferases in EMEM and Plasmax. **(C)** Synthesis pathways of *N*-glycan processing and branching. The labeled transcripts of transferases depict the processes of attaching GlcNAc to mannose on core structure, and core-fucosylation, catalyzed by MGATs, and FUT8, respectively. The synthesis pathways are acquired from GlycoMaple (<https://glycosmos.org/glycomaple/index>).

**Figure S7**



**Figure S7.** Transcript expressions of **(A)** Sialyltransferases in 231BR cell line cultivated by DMEM and Plasmex; **(B)** Fucosyltransferases in CRL cell line cultivated by DMEM and Plasmex. **(C)** Synthesis pathways of complex capping *N*- and *O*-glycans. The labeled transcripts of transferases depict the processes of sialylation catalyzed by ST3GAL or ST6GAL, and fucosylation catalyzed by FUTs. The synthesis pathways are acquired from GlycoMaple (<https://glycosmos.org/glycomaple/index>).