

Table S1. Structure and amount of glycoconjugates in the total cellular glycome of chondrocyte during hypertrophic differentiation.

No	Composition	Cluster Group	Day0	Day10	Day20	Day10/Day0	Day20/Day0	P-value	Colors of Pie charts
N-1	(Hex)2 (HexNAc)2	A	0.175 ± 0.153	0.000 ± 0.000	0.000 ± 0.000	1E-01	1E-01		
N-2	(Hex)2 (HexNAc)2 (Fuc)1	D	1.361 ± 0.149	1.932 ± 0.464	4.902 ± 1.119	1E-01	6E-03		
N-3	(Hex)3 (HexNAc)2	D	2.293 ± 0.291	1.775 ± 0.497	4.290 ± 0.906	2E-01	2E-02		
N-4	(Hex)3 (HexNAc)2 (Fuc)1	D	4.695 ± 0.224	4.580 ± 1.426	12.844 ± 2.503	9E-01	5E-03		
N-5	(Hex)4 (HexNAc)2	D	2.221 ± 0.160	2.142 ± 0.287	4.421 ± 0.803	7E-01	1E-02		
N-6	(Hex)4 (HexNAc)2 (Fuc)1	D	0.506 ± 0.138	0.616 ± 0.147	1.397 ± 0.123	4E-01	1E-03		
N-7	(Hex)2 (Fuc)1 + (Man)3 (GlcNAc)2	-	0.234 ± 0.203	0.307 ± 0.268	1.161 ± 0.274	7E-01	9E-03		
N-8	(Hex)2 + (Man)3 (GlcNAc)2	D	15.658 ± 0.923	23.833 ± 4.665	46.683 ± 11.695	4E-02	1E-02		
N-9	(Hex)3 + (Man)3 (GlcNAc)2	D	36.507 ± 1.500	58.781 ± 6.604	86.266 ± 18.948	5E-03	1E-02		
N-10	(Hex)4 + (Man)3 (GlcNAc)2	D	27.452 ± 0.754	34.093 ± 3.773	46.788 ± 8.121	4E-02	1E-02		
N-11	(Hex)5 + (Man)3 (GlcNAc)2	B	72.811 ± 3.410	68.821 ± 9.875	74.251 ± 13.931	5E-01	9E-01		
N-12	(Hex)6 + (Man)3 (GlcNAc)2	B	57.040 ± 5.054	41.776 ± 9.049	60.161 ± 10.612	6E-02	7E-01		
N-13	(HexNAc)1 + (Man)3 (GlcNAc)2	-	0.251 ± 0.217	0.366 ± 0.318	1.430 ± 0.401	6E-01	1E-02		
N-14	(HexNAc)1 (Fuc)1 + (Man)3 (GlcNAc)2	D	1.180 ± 0.139	1.717 ± 0.215	3.073 ± 0.485	2E-02	3E-03		
N-15	(Hex)1 (HexNAc)1 + (Man)3 (GlcNAc)2	D	0.199 ± 0.186	1.078 ± 0.114	2.057 ± 0.288	2E-03	7E-04		
N-16	(HexNAc)2 + (Man)3 (GlcNAc)2	D	0.000 ± 0.000	0.962 ± 0.071	1.806 ± 0.252	2E-05	2E-04		
N-17	(Hex)1 (HexNAc)1 (Fuc)1 + (Man)3 (GlcNAc)2	D	0.429 ± 0.373	2.277 ± 0.316	3.906 ± 0.638	3E-03	1E-03		
N-18	(Hex)2 (HexNAc)1 + (Man)3 (GlcNAc)2	D	0.318 ± 0.276	2.543 ± 0.336	4.434 ± 0.199	9E-04	3E-05		
N-19	(HexNAc)2 (Fuc)1 + (Man)3 (GlcNAc)2	D	2.642 ± 0.168	6.551 ± 0.810	11.155 ± 2.442	1E-03	4E-03		
N-20	(Hex)1 (HexNAc)2 + (Man)3 (GlcNAc)2	D	0.000 ± 0.000	4.536 ± 0.680	6.496 ± 0.782	3E-04	1E-04		
N-21	(HexNAc)3 + (Man)3 (GlcNAc)2	D	0.000 ± 0.000	0.976 ± 0.195	1.843 ± 0.145	1E-03	3E-05		
N-22	(Hex)2 (HexNAc)1 (Fuc)1 + (Man)3 (GlcNAc)2	D	0.869 ± 0.164	2.373 ± 0.544	3.864 ± 0.567	1E-02	9E-04		
N-23	(Hex)3 (HexNAc)1 + (Man)3 (GlcNAc)2	D	0.236 ± 0.286	2.476 ± 0.557	3.774 ± 0.410	7E-03	4E-04		
N-24	(Hex)1 (HexNAc)2 (Fuc)1 + (Man)3 (GlcNAc)2	D	1.331 ± 0.203	19.465 ± 2.615	33.386 ± 7.469	3E-04	2E-03		
N-25	(Hex)2 (HexNAc)2 + (Man)3 (GlcNAc)2	D	0.681 ± 0.065	8.210 ± 1.234	11.840 ± 1.728	5E-04	4E-04		
N-26	(HexNAc)3 (Fuc)1 + (Man)3 (GlcNAc)2	D	0.781 ± 0.245	5.545 ± 1.026	10.894 ± 2.110	1E-03	1E-03		
N-27	(Hex)1 (HexNAc)3 + (Man)3 (GlcNAc)2	D	0.000 ± 0.000	2.002 ± 0.444	3.314 ± 0.178	1E-03	6E-06		
N-28	(Hex)3 (HexNAc)1 (Fuc)1 + (Man)3 (GlcNAc)2	D	0.166 ± 0.147	1.061 ± 0.268	1.452 ± 0.071	7E-03	2E-04		
N-29	(Hex)2 (HexNAc)2 (Fuc)1 + (Man)3 (GlcNAc)2	D	0.000 ± 0.000	1.941 ± 0.326	1.454 ± 0.246	5E-04	1E-03		
N-30	(Hex)2 (HexNAc)2 (Fuc)1 + (Man)3 (GlcNAc)2	D	2.046 ± 0.287	44.622 ± 6.195	61.611 ± 13.679	3E-04	2E-03		
N-31	(Hex)3 (HexNAc)2 + (Man)3 (GlcNAc)2	D	0.000 ± 0.000	2.150 ± 0.462	2.791 ± 0.350	1E-03	2E-04		
N-32	(Hex)1 (HexNAc)3 (Fuc)1 + (Man)3 (GlcNAc)2	D	0.804 ± 0.139	23.880 ± 3.917	40.316 ± 8.875	5E-04	2E-03		
N-33	(Hex)2 (HexNAc)3 + (Man)3 (GlcNAc)2	D	0.039 ± 0.068	2.364 ± 0.688	3.627 ± 0.384	4E-03	9E-05		
N-34	(HexNAc)4 (Fuc)1 + (Man)3 (GlcNAc)2	D	0.735 ± 0.149	21.567 ± 3.438	39.491 ± 8.895	5E-04	2E-03		
N-35	(Hex)2 (HexNAc)2 (Fuc)1 + (Man)3 (GlcNAc)2	D	0.000 ± 0.000	0.881 ± 0.257	1.195 ± 0.150	3E-03	2E-04		
N-36	(Hex)3 (HexNAc)2 (Fuc)1 + (Man)3 (GlcNAc)2	D	0.213 ± 0.189	9.942 ± 1.765	14.499 ± 3.113	7E-04	1E-04		
N-37	(Hex)4 (HexNAc)2 + (Man)3 (GlcNAc)2	D	0.000 ± 0.000	1.261 ± 0.328	2.016 ± 0.241	3E-03	1E-04		
N-38	(Hex)2 (HexNAc)3 (Fuc)1 + (Man)3 (GlcNAc)2	D	0.486 ± 0.144	9.501 ± 1.639	17.026 ± 3.467	7E-04	1E-03		
N-39	(Hex)3 (HexNAc)3 + (Man)3 (GlcNAc)2	-	0.186 ± 0.170	0.559 ± 0.484	0.000 ± 0.000	3E-01	1E-01		
N-40	(HexNAc)4 (Fuc)2 + (Man)3 (GlcNAc)2	D	0.000 ± 0.000	2.002 ± 0.498	3.363 ± 0.651	2E-03	9E-04		
N-41	(Hex)1 (HexNAc)4 (Fuc)1 + (Man)3 (GlcNAc)2	-	0.000 ± 0.000	0.771 ± 0.680	0.889 ± 0.779	1E-01	1E-01		
N-42	(Hex)4 (HexNAc)2 (Fuc)1 + (Man)3 (GlcNAc)2	D	0.148 ± 0.134	4.410 ± 0.748	7.270 ± 1.451	6E-04	1E-05		
N-43	(Hex)1 (HexNAc)3 (Fuc)1 + (Man)3 (GlcNAc)2	D	0.101 ± 0.088	1.534 ± 0.267	1.964 ± 0.267	3E-04	3E-04		
N-44	(Hex)3 (HexNAc)4 + (Man)3 (GlcNAc)2	A	0.071 ± 0.067	0.000 ± 0.000	0.000 ± 0.000	1E-01	1E-01		
N-45	(Hex)1 (HexNAc)1 (Neu5Ac)1 + (Man)3 (GlcNAc)2	D	0.743 ± 0.217	1.031 ± 0.358	1.641 ± 0.085	3E-01	3E-03		
N-46	(Hex)1 (HexNAc)1 (Fuc)1 (Neu5Ac)1 + (Man)3 (GlcNAc)2	D	0.975 ± 0.115	1.565 ± 0.398	3.180 ± 0.612	7E-02	4E-03		
N-47	(Hex)2 (HexNAc)1 (Neu5Ac)1 + (Man)3 (GlcNAc)2	D	2.004 ± 0.511	3.530 ± 0.747	4.097 ± 0.272	4E-02	3E-03		
N-48	(Hex)2 (HexNAc)1 (Fuc)1 (Neu5Ac)1 + (Man)3 (GlcNAc)2	D	0.862 ± 0.150	1.724 ± 0.480	2.533 ± 0.338	4E-02	1E-03		
N-49	(Hex)3 (HexNAc)1 (Neu5Ac)1 + (Man)3 (GlcNAc)2	D	1.047 ± 0.371	1.940 ± 0.673	2.667 ± 0.155	1E-01	2E-05		
N-50	(Hex)1 (HexNAc)2 (Fuc)1 (Neu5Ac)1 + (Man)3 (GlcNAc)2	D	0.723 ± 0.148	3.321 ± 0.688	4.413 ± 0.735	1E-03	1E-03		
N-51	(Hex)2 (HexNAc)2 (Neu5Ac)1 + (Man)3 (GlcNAc)2	D	0.911 ± 0.069	3.258 ± 0.713	4.075 ± 0.492	5E-03	4E-04		
N-52	(Hex)1 (HexNAc)2 (Fuc)2 (Neu5Ac)1 + (Man)3 (GlcNAc)2	-	0.093 ± 0.087	0.000 ± 0.000	0.540 ± 0.472	1E-01	2E-01		
N-53	(Hex)2 (HexNAc)2 (Fuc)1 (Neu5Ac)1 + (Man)3 (GlcNAc)2	D	1.876 ± 0.388	32.466 ± 5.285	35.163 ± 6.644	6E-04	1E-03		
N-54	(Hex)3 (HexNAc)2 (Neu5Ac)1 + (Man)3 (GlcNAc)2	D	0.598 ± 0.188	3.157 ± 0.886	3.405 ± 0.442	8E-03	5E-04		
N-55	(Hex)1 (HexNAc)3 (Fuc)1 (Neu5Ac)1 + (Man)3 (GlcNAc)2	D	0.517 ± 0.127	7.188 ± 1.498	9.808 ± 2.095	2E-03	2E-03		
N-56	(Hex)2 (HexNAc)3 (Neu5Ac)2 + (Man)3 (GlcNAc)2	A	0.653 ± 0.113	0.000 ± 0.000	0.000 ± 0.000	6E-04	6E-04		
N-57	(Hex)3 (HexNAc)2 (Fuc)1 (Neu5Ac)1 + (Man)3 (GlcNAc)2	D	0.822 ± 0.211	11.741 ± 2.105	13.113 ± 2.832	9E-04	2E-03		
N-58	(Hex)2 (HexNAc)3 (Fuc)1 (Neu5Ac)1 + (Man)3 (GlcNAc)2	D	0.139 ± 0.122	3.093 ± 0.534	3.785 ± 0.581	7E-04	4E-04		
N-59	(Hex)2 (HexNAc)2 (Fuc)1 (Neu5Ac)2 + (Man)3 (GlcNAc)2 lacton	D	0.000 ± 0.000	2.071 ± 0.509	1.879 ± 0.215	2E-03	1E-04		
N-60	(Hex)2 (HexNAc)2 (Fuc)1 (Neu5Ac)2 + (Man)3 (GlcNAc)2	D	0.534 ± 0.132	10.442 ± 2.311	9.256 ± 2.159	2E-03	2E-03		
N-61	(Hex)1 (HexNAc)3 (Fuc)1 (Neu5Ac)1 + (Man)3 (GlcNAc)2	D	0.153 ± 0.136	1.448 ± 0.324	1.343 ± 0.164	3E-03	6E-04		
N-62	(Hex)2 (HexNAc)3 (Fuc)1 (Neu5Ac)2 + (Man)3 (GlcNAc)2	D	0.058 ± 0.051	0.856 ± 0.204	1.038 ± 0.170	3E-03	7E-04		
N-63	(Hex)3 (HexNAc)3 (Neu5Ac)2 + (Man)3 (GlcNAc)2	A	0.060 ± 0.052	0.000 ± 0.000	0.000 ± 0.000	1E-01	1E-01		
N-64	(Hex)3 (HexNAc)3 (Fuc)1 (Neu5Ac)2 + (Man)3 (GlcNAc)2	-	0.087 ± 0.079	0.878 ± 0.268	0.421 ± 0.365	8E-03	2E-01		
N-65	(Hex)3 (HexNAc)3 (Fuc)1 (Neu5Ac)2 + (Man)3 (GlcNAc)2	-	0.069 ± 0.064	0.429 ± 0.146	0.113 ± 0.195	2E-02	7E-01		
O-1	(GalNAc)1 (Tr)	C	102.283 ± 10.086	182.883 ± 46.954	119.933 ± 33.976	4E-02	4E-01		
O-2	(Gal)1 (GalNAc)1 (Tu)	C	8.554 ± 0.294	30.797 ± 8.843	19.376 ± 0.300	1E-02	2E-06		
O-3	(Gal)1 (GalNAc)1 (Neu5Ac)1 (ST)	C	11.663 ± 1.251	64.104 ± 18.924	49.213 ± 3.474	9E-03	6E-05		
O-4	(Gal)1 (GalNAc)1 (Neu5Ac)1 (DST)	C	3.968 ± 0.128	24.018 ± 11.035	17.520 ± 3.582	3E-02	3E-03		
GSL-1	(Hex)2	A	11.887 ± 11.878	5.253 ± 0.366	2.384 ± 1.141	4E-01	2E-01		
GSL-2	(Hex)2 (Neu5Ac)1	B	10.315 ± 2.383	4.637 ± 0.414	4.319 ± 0.659	2E-02	1E-02		
GSL-3	(Hex)3 (Neu5Ac)2	A	0.142 ± 0.019	0.000 ± 0.000	0.014 ± 0.024	2E-04	2E-03		
GSL-4	(Hex)3 (HexNAc)2 (Neu5Ac)2	B	3.145 ± 0.566	0.226 ± 0.010	0.258 ± 0.096	9E-04	1E-03		
GSL-5	(Hex)3	A	0.140 ± 0.168	0.188 ± 0.326	0.002 ± 0.003	8E-01	2E-01		
GSL-6	(Hex)4 (HexNAc)1	A	2.034 ± 2.204	0.272 ± 0.089	0.143 ± 0.145	2E-01	2E-01		
GSL-7	(Hex)5 (HexNAc)1	A	1.793 ± 3.105	0.275 ± 0.163	0.026 ± 0.046	4E-01	4E-01		
GSL-8	(Hex)7	-	0.000 ± 0.000	0.000 ± 0.000	0.001 ± 0.002	n.d.	4E-01		
GSL-9	(Hex)6 (HexNAc)1	A	0.074 ± 0.128	0.038 ± 0.044	0.002 ± 0.003	7E-01	4E-01		
GSL-10	(Hex)7 (HexNAc)1	-	0.001 ± 0.002	0.029 ± 0.026	0.000 ± 0.000	1E-01	4E-01		
GSL-11	(Hex)8 (HexNAc)1	-	0.000 ± 0.000	0.012 ± 0.020	0.000 ± 0.000	4E-01	n.d.		
GSL-12	(Hex)5 (HexNAc)3	A	0.040 ± 0.045	0.000 ± 0.000	0.000 ± 0.000	2E-01	2E-01		
GSL-13	(Hex)4 (HexNAc)4	A	0.025 ± 0.043	0.000 ± 0.000	0.013 ± 0.023	4E-01	7E-01		
GSL-14	(Hex)4 (HexNAc)3 (Neu5Ac)1	A	0.144 ± 0.170	0.046 ± 0.039	0.000 ± 0.000	4E-01	2E-01		
GSL-15	(Hex)5 (HexNAc)3 (Neu5Ac)1	A	0.042 ± 0.023	0.000 ± 0.000	0.006 ± 0.011	3E-02	7E-02		
GSL-16	(Hex)6 (HexNAc)3 (Neu5Ac)1	A	0.034 ± 0.029	0.000 ± 0.000	0.000 ± 0.000	1E-01	1E-01		
GSL-17	(Hex)5 (HexNAc)4 (Neu5Ac)1	A	0.028 ± 0.048	0.000 ± 0.000	0.000 ± 0.000	4E-01	4E-01		
GSL-18	(Hex)6 (HexNAc)3 (Fuc)1	A	0.034 ± 0.031	0.000 ± 0.000	0.001 ± 0.021	1E-01	4E-01		
GSL-19	(Hex)5 (HexNAc)2	A	0.611 ± 0.206	0.024 ± 0.030	0.010 ± 0.012	8E-03	7E-03		
GSL-20	(Hex)3 (HexNAc)1	A	7.091 ± 1.840	1.979 ± 0.109	1.348 ± 0.432	9E-03	6E-03		
GSL-21	(Hex)3 (HexNAc)2 (Neu5Ac)1	A	0.471 ± 0.107	0.000 ± 0.000	0.015 ± 0.014	2E-03	2E-03		
GSL-22	(Hex)3 (HexNAc)1 (Neu5Ac)2	D	8.417 ± 1.537	14.888 ± 2.256	17.846 ± 5.795	1E-02	5E-02		
GSL-23	(Hex)3 (HexNAc)1 (Neu5Ac)1 (Neu5Glc)1	D	0.115 ± 0.013	0.398 ± 0.054	0.691 ± 0.282	9E-04	2E-02		
GSL-24	(Hex)4 (HexNAc)2 (Neu5Ac)1	A	0.220 ± 0.018	0.008 ± 0.014	0.090 ± 0.016	8E-05	1E-04		
GSL-25	(Hex)5 (HexNAc)1 (Neu5Ac)3-lactone2	A	0.078 ± 0.034	0.015 ± 0.026	0.000 ± 0.000	6E-02	2E-02		
GSL-26	(Hex)3 (HexNAc)1 (Neu5Ac)3-lactone1	A	0.240 ± 0.030	0.000 ± 0.000	0.000 ± 0.000	2E-04	2E-04		
GSL-27	(Hex)3 (HexNAc)2	C	0.654 ± 0.686	1.991 ± 0.293	1.490 ± 0.415	4E-02	1E-01		
GSL-28	(Hex)3 (HexNAc)1 (Neu5Ac)1-lactone1	A	0.079 ± 0.019	0.000					