

N-glycosylation alteration of serum and salivary immunoglobulin A is a possible biomarker in oral mucositis

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Table S1. The key demographic and clinical data of the participants.

Average age (years)	Conditioning regimen
Controls 41.9±18.35	BEAM 5
Patients 49.5±14.19	Melphalan (high dose, ≥200 mg/m ²) 3
Gender	Pretreatment time (months)
Controls 9F, 1M	Hodgkin lymphoma 10.5±0.7
Patients 5F, 3M	Non-Hodgkin lymphoma 9±4.6
	Multiple myeloma 10±7
Diagnosis	Pretransplantational stage of the disease
Hodgkin lymphoma 2	Complete remission 5
Non-Hodgkin lymphoma 3	Very good partial remission 1
Multiple myeloma 3	Partial remission 2

BEAM (BCNU, etoposide, cytosine arabinoside, melphalan); F (female); M (male).

Table S2. Mean and standard errors of the PeakArea% of the significantly changed IgA N-glycan structures in the serum.

Glycan	Experimental group					p value
	control (n = 10)	day -3/-7 (n = 8)	day 0 (n = 8)	day +7 (n = 8)	day +14 (n = 7)	
FA2BG2S2	6.13±3.75 ^a	12.1±3.23 ^b	11.5±2.45 ^b	9.12±2.59 ^{ab}	7.25±2.7 ^b	0.0006
FA3G3[3]S3	2.67±2.7 ^a	15.1±5.67 ^b	15.6±6.65 ^b	13.1±4.49 ^b	12.9±5.07 ^b	<0.0001
A1[3]	1.92±3.41 ^a	3.39±1.42 ^{ab}	3.61±1.45 ^{ab}	4.62±1.8 ^b	3.4±2.69 ^{ab}	0.0142
A2BG2S1	11.6±5.03 ^a	1.46±0.32 ^b	1.38±0.239 ^b	1.04±0.44 ^b	1.19±0.551 ^b	0.0010
A2	1.01±0.734 ^a	9.86±3.71 ^b	11.3±2.64 ^b	12.3±1.7 ^b	7.25±5.99 ^{ab}	0.0002
A2B	2.08±1.59 ^a	9.11±2.94 ^b	8.53±2.95 ^b	7.12±2.32 ^b	10.3±3.73 ^b	0.0001
FA2	0.475±0.277 ^a	3.8±1.76 ^b	2.97±1.59 ^b	4.46±1.88 ^b	2.75±1.9 ^b	<0.0001
M7b	1.98±0.734 ^a	0.598±0.153 ^{ab}	0.354±0.178 ^b	0.654±0.7 ^b	1.17±0.937 ^{ab}	0.0002
A4	5.97±2.79 ^a	2.63±0.638 ^{ab}	1.94±0.751 ^b	2.37±1.34 ^{ab}	1.47±1.14 ^b	<0.0001
FA2[3]G1	3.28±1.72 ^a	0.503±0.184 ^b	0.525±0.245 ^b	0.496±0.151 ^b	0.46±0.273 ^b	<0.0001

A2G2	3.92±0.922 ^a	0.646±0.384 ^b	0.748±0.492 ^b	0.678±0.28 ^b	1.37±0.761 ^{ab}	<0.0001
A2BG2	1.26±0.437 ^a	0.774±0.3 ^{ab}	0.574±0.341 ^b	0.705±0.386 ^{ab}	0.671±0.36 ^{ab}	0.0239
FA2G2	10.7±4.59 ^a	2.06±1.04 ^{ab}	1.45±0.86 ^b	1.78±0.752 ^b	1.82±0.83 ^b	<0.0001
FA2BG2	1.79±0.522 ^a	0.306±0.434 ^b	0.404±0.684 ^b	0.153±0.074 ^b	0.259±0.273 ^b	<0.0001

Values are mean PeakAreas%±SD. Superscript 'a' indicates baseline control level; 'b' indicates significant difference (p<0.05), 'ab' indicates no significant difference, analyzed with one-way analysis of variance (ANOVA).

Table S3. Comparison of various IgA N-glycan structures in serum in different groups and time points with Tukey's multiple comparisons statistical test. p<0.05 is considered significant difference.

Comparison		FA2BG2S2	FA3G3[3]S3	A1[3]	A2BG2S1	A2
control vs. day -3/-7	-3/-7	0.0016	<0.0001	0.6844	<0.0001	0.0464
control vs. day 0		0.0058	<0.0001	0.5642	<0.0001	0.0069
control vs. day +7		0.2518	0.0008	0.01354	<0.0001	0.0002
control vs. day +14		0.9424	0.0017	0.708	<0.0001	0.2887
day -3/-7 vs. day 0		0.9919	0.9997	0.9997	>0.9999	>0.9999
day -3/-7 vs. day +7		0.2894	0.9314	0.8346	0.9974	>0.9999
day -3/-7 vs. day +14		0.0279	0.9047	>0.9999	0.9996	>0.9999
day 0 vs. day +7		0.5354	0.8589	0.9104	0.9989	>0.9999
day 0 vs. day +14		0.0755	0.8238	0.9998	>0.9999	>0.9999
day +7 vs. day +14		0.7583	>0.9999	0.8552	>0.9999	0.594

Comparison		A2B	FA2	M7b	A4	FA2[3]G1
control vs. day -3/-7	-3/-7	<0.0001	0.0006	0.1235	0.4163	0.0099
control vs. day 0		0.0001	0.0137	0.0001	0.0158	0.0111
control vs. day +7		0.0034	<0.0001	0.0125	0.0699	0.0135
control vs. day +14		<0.0001	0.0382	0.8881	0.0024	0.0038
day -3/-7 vs. day 0		0.9928	0.8194	0.7773	>0.9999	>0.9999
day -3/-7 vs. day +7		0.5898	0.9109	>0.9999	>0.9999	>0.9999
day -3/-7 vs. day +14		0.906	0.6907	>0.9999	>0.9999	>0.9999
day 0 vs. day +7		0.8348	0.3215	>0.9999	>0.9999	>0.9999
day 0 vs. day +14		0.7037	0.9988	0.1746	>0.9999	>0.9999
day +7 vs. day +14		0.1725	0.2297	>0.9999	>0.9999	>0.9999

Comparison		A2G2	A2BG2	FA2G2	FA2BG2
control vs. day -3/-7	-3/-7	0.0004	0.4809	0.0513	0.0062
control vs. day 0		0.0007	0.0301	0.0012	0.0012
control vs. day +7		0.0011	0.1386	0.0176	0.0096
control vs. day +14		0.3979	0.1742	0.0233	0.0216
day -3/-7 vs. day 0		>0.9999	>0.9999	>0.9999	>0.9999
day -3/-7 vs. day +7		>0.9999	>0.9999	>0.9999	>0.9999
day -3/-7 vs. day +14		0.6738	>0.9999	>0.9999	>0.9999
day 0 vs. day +7		>0.9999	>0.9999	>0.9999	>0.9999
day 0 vs. day +14		0.9141	>0.9999	>0.9999	>0.9999
day +7 vs. day +14		>0.9999	>0.9999	>0.9999	>0.9999

Table S4. Comparison of various IgA N-glycan structures in saliva in different groups and time points with Tukey's multiple comparisons statistical test. $p < 0.05$ is considered significant difference.

Comparison	FA2	M7a	FA2B	A2G2	Unknown
control vs. day -3/-7	0.0377	0.1754	0.1419	0.0836	0.017
control vs. day 0	0.1232	0.0613	0.0523	0.1095	>0.9999
control vs. day +7	0.0165	0.2695	0.0109	0.2522	>0.9999
control vs. day +14	0.0054	0.0428	0.0109	0.0096	>0.9999
day -3/-7 vs. day 0	0.9993	0.9773	>0.9999	>0.9999	>0.9999
day -3/-7 vs. day +7	0.9723	>0.9999	>0.9999	0.985	0.5102
day -3/-7 vs. day +14	0.9476	0.9473	>0.9999	0.9587	>0.9999
day 0 vs. day +7	0.9346	0.974	>0.9999	0.9818	>0.9999
day 0 vs. day +14	0.8952	0.9999	>0.9999	0.9769	>0.9999
day +7 vs. day +14	>0.9999	0.9446	>0.9999	0.7404	>0.9999

Comparison	Unknown
control vs. day -3/-7	0.0939
control vs. day 0	0.0336
control vs. day +7	0.6541
control vs. day +14	0.0747
day -3/-7 vs. day 0	0.9721
day -3/-7 vs. day +7	0.7224
day -3/-7 vs. day +14	0.9987
day 0 vs. day +7	0.3935
day 0 vs. day +14	0.9976
day +7 vs. day +14	0.5993

Table S5. Mean and standard errors of the PeakArea% of the significantly changed IgA N-glycan structures in the saliva.

Glycan	Experimental group					p value
	control (n = 10)	day -3/-7 (n = 8)	day 0 (n = 7)	day +7 (n = 7)	day +14 (n = 7)	
FA2	4.33±2.84 ^a	1.72±0.69 ^b	1.96±1.3 ^{ab}	1.1±0.334 ^b	1.04±0.918 ^b	0.0030
M7a	6.2±4.41 ^a	3.34±2.01 ^{ab}	2.57±1.12 ^{ab}	3.43±1.48 ^{ab}	2.37±1.21 ^b	0.0334
FA2B	15.5±5.55 ^a	6.31±6.42 ^{ab}	3.87±2.46 ^{ab}	3.79±2.59 ^b	3.3±1.97 ^b	<0.0001
A2G2	15.7±10.2 ^a	5.15±4.39 ^{ab}	4.88±4.52 ^{ab}	7.49±7.01 ^{ab}	2.19±1.09 ^b	0.0092
Unknown	4.82±2.06 ^a	1.23±0.577 ^b	3.41±2.58 ^{ab}	6.92±9.29 ^{ab}	3.34±1.93 ^{ab}	0.0408
Unknown	4.65±1.84 ^a	1.72±1.08 ^{ab}	0.905±0.576 ^b	3.22±3.37 ^{ab}	1.36±0.673 ^{ab}	0.0157

Values are mean PeakAreas%±SD. Superscript 'a' indicate baseline control level; 'b' indicates significant difference ($p < 0.05$), 'ab' indicates no significant difference, analyzed with one-way analysis of variance (ANOVA).

Table S6. The sialoform to neutral (SF/NF) carbohydrate ratio of saliva and serum total IgA-associated glycans (upper half) and of the overlapping (i.e. present both in serum and saliva) glycan structures (lower half).

Saliva samples					
Group	control	day -3/-7	day 0	day +7	day +14
SF/NF ratio	0.38	0.74	0.70	0.57	0.64
mean%/%	27.63/72.37	42.54/57.46	41.12/58.88	36.16/63.84	39.12/60.88
Serum samples					
SF/NF ratio	2.24	5.68	7.12	5.56	3.96
mean%/%	69.12/30.88	85.03/14.97	87.68/12.32	84.75/15.25	79.82/20.18
Overlapping structures					
Saliva samples					
Group	control	day -3/-7	day 0	day +7	day +14
SF/NF ratio	0.61	0.59	0.79	0.72	0.80
mean%/%	38.03/61.97	37.11/62.89	44.01/55.99	41.93/58.07	44.57/55.43
Serum samples					
SF/NF ratio	2.15	11.27	13.85	12.27	5.30
mean%/%	68.25/31.75	91.85/8.15	93.26/6.74	92.46/7.54	84.13/15.87