

Table S1. Protein name, antibody and diluted concentration

KEGG Entry	Common name	Gene symbol		Primary antibody name in Abcam	Product ID	Dilution
K19459	LMP1	LMP1	EBV Latent Membrane Protein 1	EBV Latent Membrane Protein 1	ab78113	1:150
K19457	EBNA2	EBNA2		EBNA2	ab90543	1:150
K01068	ACOT1	ACOT1		ACOT1	ab100915	1:200
K01068	ACOT4	ACOT4		ACOT4	ab121116	1:200
K06547	CD166	ALCAM		CD166	ab109215	1:150
K04365	BRAF	BRAF		BRAF	ab33899	1:300
K06745	PDL1	CD274		PDL1	ab205921	1:300
K06746	B7H3	CD276		B7H3	ab134161	1:400
K06454	CD4	CD4		CD4	ab183685	1:300
K03985	CD87	CD87		U-PAR	ab218106	1:250
K10031	CXCL12	CXCL12		SDF1	ab9797	1:200
K10032	CXCL13	CXCL13		BCA1	ab199043	1:200
K10226	FADS2	FADS2		FADS2	ab170665	1:300
K10225	FADS3	FADS3		FADS3	ab232810	1:350
K12419	FADS6	FADS6		FADS6	ab150795	1:300
K07515	HADHA	HADHA		HADHA	ab203114	1:400
K06751	MHC-1	HLAA		MHC class I	ab15681	1:300
K06751	MHC-2	HLAB		HLA-B	ab225636	1:350
K06751	MHC-3	HLAC		HLA-C	ab232903	1:350
K01074	PPT1	PPT1		PPT1	ab38417	1:300
K01074	PPT2	PPT2		PPT2	ab160459	1:200
K03172	TRAF1	TRAF1		TRAF1	ab203316	1:250
K03173	TRAF2	TRAF2		TRAF2	ab126758	1:300

Table S2. Consistency of protein measurements

IHC category	Kappa	P value
ACOT1	0.428	<0.001
CD166	0.483	<0.001
B7H3	0.476	<0.001
CXCL12	0.565	<0.001
HCAA	0.413	<0.001
CD87	0.484	<0.001
HLAB	0.487	<0.001
TRAF1	0.496	<0.001

Crosstabs of ACOT1 score

score	ACOT1_ave2									Total
score	0	1	2	3	4	6	8	9	12	
0	47	18	0	0	0	0	0	0	0	65
1	18	60	27	0	0	0	0	0	0	105
2	0	34	65	33	0	0	0	0	0	132
ACO 3	0	0	15	50	10	13	8	0	0	96
T1_av 4	0	0	0	12	29	23	0	6	0	70
el 6	0	0	0	14	1	26	4	2	0	47
8	0	0	0	6	0	4	1	0	0	11
9	0	0	0	0	4	3	1	3	0	11
12	0	2	0	0	0	0	0	0	0	2
Total	0	0	0	0	0	0	0	0	1	1

Crosstabs of CD166 score

score	CD166_ave2									Total
score	0	1	2	3	4	6	8	9	12	
0	50	22	0	0	0	0	0	0	0	72
1	17	61	29	0	0	0	0	0	0	107
2	0	28	68	21	0	0	0	0	0	117
CD16 3	0	0	18	65	13	12	2	0	0	110
6_ave 4	0	0	0	9	37	23	0	5	0	74
1 6	0	0	0	6	1	16	7	4	0	34
8	0	0	0	4	0	4	3	0	0	11
9	0	0	0	0	3	5	0	7	0	15
12	0	0	0	0	0	0	0	0	0	0
Total	67	111	115	105	54	60	12	16	0	540

Crosstabs of B7H3 score

score		B7H3_ave2									Total
score	0	1	2	3	4	6	8	9	12		
0	33	31	0	0	0	0	0	0	0	64	
1	0	71	0	0	0	0	0	0	0	71	
2	0	49	53	40	0	0	0	0	0	142	
3	0	0	0	61	32	0	0	0	0	93	
4	0	0	0	0	46	21	0	9	0	76	
6	0	0	0	35	0	25	6	8	0	74	
8	0	0	0	8	0	0	2	2	0	12	
9	0	0	0	0	0	0	0	8	0	8	
12	0	0	0	0	0	0	0	0	0	0	
Total	33	151	53	144	78	46	8	27	0	540	

Crosstabs of CXCL12 score

score		CXCL12_ave2									Total
score	0	1	2	3	4	6	8	9	12		
0	40	28	0	0	0	0	0	0	0	68	
1	12	70	20	0	0	0	0	0	0	102	
2	0	33	57	18	0	0	0	0	0	108	
3	0	0	20	70	12	19	4	0	0	125	
4	0	0	0	13	30	22	0	1	0	66	
6	0	0	0	20	0	26	4	3	0	53	
8	0	0	0	1	0	4	3	0	0	8	
9	0	0	0	0	4	4	0	1	0	9	
12	0	0	0	0	0	0	0	0	1	1	
Total	52	131	97	122	46	75	11	5	1	540	

Crosstabs of HLAA score

score		HLAA_ave2									Total
score	0	1	2	3	4	6	8	9	12		
0	39	27	0	0	0	0	0	0	0	66	
1	12	44	24	0	0	0	0	0	0	80	
2	0	29	64	21	0	0	0	0	0	114	
HLA A_ave	3	0	0	20	65	14	13	9	0	121	
4	0	0	0	17	42	24	0	3	0	86	
1	6	0	0	0	18	1	18	3	3	43	
	8	0	0	0	7	0	5	1	1	14	
	9	0	0	0	0	7	6	0	2	15	
	12	0	0	0	0	0	0	0	0	1	
Total	51	100	108	128	64	66	13	9	1	540	

Crosstabs of CD87 score

score		CD87_ave2									Total
score	0	1	2	3	4	6	8	9	12		
0	43	9	0	0	0	0	0	0	0	52	
1	18	68	30	0	0	0	0	0	0	116	
2	0	30	68	17	0	0	0	0	0	115	
CD87_ave	3	0	0	15	67	7	14	6	0	109	
1	4	0	0	0	17	32	28	0	2	79	
	6	0	0	0	8	0	23	5	5	41	
	8	0	0	0	3	0	6	3	2	14	
	9	0	0	0	0	4	6	1	1	12	
	12	0	0	0	0	0	0	0	2	2	
Total	61	107	113	112	43	77	15	10	2	540	

Crosstabs of HLAB score

score		HLAB_ave2								Total	
score		33	26	0	0	0	0	0	0	12	
	0	24	68	29	0	0	0	0	0	0	59
	1	0	36	59	24	0	0	0	0	0	121
	2	0	0	17	62	15	0	3	0	0	119
HLA	3	0	0	0	7	40	13	0	2	0	97
B_ave	4	0	0	0	0	15	40	6	0	0	62
1	6	0	0	0	5	0	6	5	1	0	61
	8	0	0	0	0	1	0	0	3	0	17
	9	33	26	0	0	0	0	0	0	0	4
	12	0	0	0	0	1	0	0	0	0	0
Total		57	130	105	98	71	59	14	6	0	540

Crosstabs of TRAF1 score

score		TRAF1_ave2								Total	
score		0	1	2	3	4	6	8	9	12	
	0	43	18	0	0	0	0	0	0	0	61
	1	19	86	26	0	0	0	0	0	0	131
	2	0	34	57	21	0	0	0	0	0	112
TRAF	3	0	0	18	73	9	11	7	0	0	118
1_ave	4	0	0	0	20	37	12	0	0	0	69
1	6	0	0	0	8	1	10	4	3	0	26
	8	0	0	0	2	0	3	4	0	0	9
	9	0	0	0	0	3	4	0	5	0	12
	12	0	0	0	0	0	0	0	0	2	2
Total		62	138	101	124	50	40	15	8	2	540

Table S3 All of 21 proteins expression in gastric adenocarcinoma

Test result	vPosGE	Sensitivity	1 - specificity	Yoden index
AC011 score	2.75	0.536	0.254	0.282
	2.25	0.362	0.166	0.252
	3.25	0.418	0.195	0.223
	3.75	0.372	0.161	0.211
	4.25	0.306	0.123	0.183
	1.75	0.701	0.521	0.18
	1.25	0.806	0.644	0.182
	4.75	0.243	0.089	0.154
	5.25	0.188	0.064	0.124
	0.75	0.895	0.784	0.111
	5.75	0.155	0.047	0.108
	6.25	0.089	0.021	0.068
	6.75	0.059	0.017	0.042
	7.25	0.043	0.004	0.039
	0.25	0.924	0.898	0.029
	7.75	0.026	0.004	0.022
	8.25	0.023	0.004	0.019
	8.75	0.02	0.004	0.016
	9.75	0.013	0	0.013
	11.25	0.003	0	0.003
	-1	1	0	0
	13	0	0	0

Test result	vPosGE	Sensitivity	1 - specificity	Yoden index
HA1 score	2.75	0.589	0.343	0.246
	2.25	0.661	0.424	0.237
	1.75	0.766	0.559	0.207
	3.25	0.451	0.246	0.205
	3.75	0.385	0.199	0.186
	1.25	0.852	0.674	0.178
	4.25	0.296	0.14	0.156
	0.75	0.918	0.775	0.143
	4.75	0.224	0.102	0.122
	5.25	0.174	0.064	0.11
	5.75	0.135	0.047	0.088
	0.25	0.964	0.881	0.083
	6.25	0.089	0.03	0.059
	7.25	0.053	0	0.053
	6.75	0.066	0.017	0.049
	7.75	0.023	0	0.023
	8.25	0.015	0	0.015
	8.75	0.016	0	0.016
	9.5	0.01	0	0.01
	10.25	0.007	0	0.007
	-1	1	0	0
	11.5	0	0	0

Test result	vPosGE	Sensitivity	1 - specificity	Yoden index
AC014 score	4.75	0.253	0.229	0.024
	5.75	0.155	0.144	0.011
	4.25	0.303	0.301	0.002
	11.5	0	1	0
	0	0	0	0
	9.75	0	0.004	-0.004
	5.25	0.171	0.178	-0.007
	1.25	0.845	0.852	-0.007
	0.25	0.957	0.966	-0.009
	2.25	0.834	0.844	-0.012
	8.25	0.007	0.021	-0.014
	8.75	0.003	0.017	-0.014
	1.75	0.76	0.78	-0.02
	7.75	0.014	0.014	-0.021
	6.75	0.063	0.085	-0.022
	7.25	0.026	0.055	-0.029
	0.75	0.918	0.949	-0.031
	6.25	0.075	0.114	-0.038
	3.75	0.375	0.424	-0.041
	2.75	0.559	0.61	-0.051
	3.25	0.414	0.479	-0.065

Test result	vPosGE	Sensitivity	1 - specificity	Yoden index
CD4 score	4.75	0.22	0.216	0.004
	0.25	0.964	0.982	0.002
	-1	1	1	0
	13	0	0	0
	5.25	0.158	0.161	-0.008
	11.25	0	0.004	-0.004
	0.75	0.924	0.928	-0.004
	7.25	0.046	0.051	-0.005
	8.25	0.018	0.021	-0.005
	5.75	0.138	0.144	-0.006
	7.75	0.023	0.03	-0.007
	9.75	0	0.008	-0.008
	1.75	0.75	0.758	-0.008
	8.75	0.014	0.021	-0.01
	1.25	0.822	0.835	-0.013
	6.25	0.076	0.093	-0.017
	6.75	0.056	0.076	-0.02
	4.25	0.257	0.288	-0.031
	3.75	0.398	0.398	-0.039
	2.25	0.612	0.661	-0.049
	2.75	0.543	0.61	-0.067
	3.25	0.388	0.479	-0.091

Test result	vPosGE	Sensitivity	1 - specificity	Yoden index
CD87 score	2.25	0.398	0.648	-0.25
	2.75	0.339	0.589	-0.25
	1.75	0.526	0.771	-0.245
	3.25	0.227	0.449	-0.222
	3.75	0.191	0.394	-0.203
	1.25	0.658	0.856	-0.198
	0.25	0.938	0.938	-0.188
	4.75	0.109	0.271	-0.162
	0.75	0.806	0.953	-0.147
	5.25	0.076	0.195	-0.119
	2.25	0.875	0.979	-0.104
	5.75	0.066	0.169	-0.103
	6.25	0.03	0.119	-0.089
	6.75	0.026	0.097	-0.071
	7.25	0.013	0.068	-0.055
	8.25	0	0.025	-0.025
	7.75	0.007	0.013	-0.023
	8.75	0	0.013	-0.013
	9.75	0	0.008	-0.008
	11.25	0	0.004	-0.004
	-1	1	1	0
	13	0	0	0

Test result	vPosGE	Sensitivity	1 - specificity	Yoden index
HLA8 score	2.25	0.368	0.657	-0.289
	2.75	0.299	0.572	-0.273
	3.25	0.197	0.441	-0.244
	1.75	0.5	0.737	-0.237
	1.25	0.648	0.886	-0.218
	1.75	0.641	0.831	-0.19
	0.25	0.909	0.92	-0.183
	4.75	0.082	0.208	-0.126
	0.75	0.803	0.903	-0.1
	5.25	0.056	0.153	-0.097
	5.75	0.049	0.127	-0.078
	6.25	0.023	0.081	-0.058
	6.75	0.023	0.068	-0.045
	7.25	0.024	0.058	-0.034
	7.75	0.016	0.042	-0.026
	7.75	0.013	0.03	-0.017
	8.75	0.007	0.013	-0.006
	10.25	0	0.004	-0.004
	9.5	0.003	0.004	-0.001
	-1	1	1	0
	11.5	0	0	0

Test result	vPosGE	Sensitivity	1 - specificity	Yoden index
HLA3 score	3.25	0.443	0.453	0.009
	8.25	0.013	0.021	0.008
	8.75	0.01	0.021	0.005
	3.75	0.401	0.403	0.004
	5.25	0.178	0.183	0.004
	5.75	0.138	0.123	0.004
	9.25	0.961	0.962	0.003
	9.75	0.003	0.004	0.003
	7.75	0.02	0.03	0.003
	7.75	0.021	0.01	0.000
	11.5	0	0	0.000
	4.25	0.296	0.271	-0.001
	4.75	0.243	0.208	-0.001
	7.25	0.056	0.051	-0.008
	6.75	0.076	0.068	-0.013
	6.25	0.095	0.085	-0.016
	2.75	0.599	0.581	-0.016
	3.25	0.641	0.641	-0.019
	1.25	0.826	0.864	-0.033
	1.75	0.773	0.814	-0.041

Test result	vPosGE	Sensitivity	1 - specificity	Yoden index
FBL1 score	3.75	0.428	0.379	0.055
	3.25	0.454	0.428	0.026
	5.75	0.141	0.119	0.022
	6.25	0.095	0.076	0.019
	7.75	0.026	0.021	0.015
	5.25	0.151	0.14	0.011
	6.75	0.069	0.059	0.01
	9.75	0.007	0	0.007
	7.25	0.043	0.038	0.005
	8.25	0.023	0.002	0.002
	-1	1	0	0
	11.5	0	0	0
	8.75	0.013	0.017	-0.004
	4.25	0.277	0.275	-0.021
	4.75	0.214	0.225	-0.011
	0.25	0.954	0.97	-0.016
	0.75	0.931	0.949	-0.018
	2.75	0.556	0.619	-0.063
	1.75	0.72	0.788	-0.068
	1.25	0.809	0.881	-0.072
	2.25	0.599	0.699	-0.1

Test result	vPosGE	Sensitivity	1 - specificity	Yoden index
FBL2 score	4.75	0.957	0.964	0.025
	6.25	0.086	0.064	0.022
	0.25	0.977	0.958	0.019
	5.75	0.151	0.14	0.011
	5.25	0.171	0.161	0.011
	6.75	0.066	0.059	0.007
	7.75	0.03	0.025	0.005
	9.75	0.007	0.004	0.003
	8.25	0.023	0.021	0.002
	-1	1	0	0
	11.5	0	0	0
	4.75	0.23	0.233	-0.003
	7.25	0.046	0.051	-0.005
	8.75	0.016	0.021	-0.01
	1.25	0.842	0.852	-0.01
	1.75	0.753	0.78	-0.027
	4.25	0.263	0.292	-0.029
	2.25	0.628	0.661	-0.033
	3.25	0.421	0.462	-0.041
	2.75	0.546	0.597	-0.051
	3.75	0.365	0.419	-0.054

Test result	vPosGE	Sensitivity	1 - specificity	Yoden index
FBL3 score	3.25	0.181	0.247	-0.061
	3.75	0.145	0.199	-0.054
	2.75	0.266	0.318	-0.052
	2.25	0.339	0.381	-0.042
	1.75	0.493	0.534	-0.041
	0.75	0.799	0.835	-0.036
	1.25	0.602	0.636	-0.034
	4.25	0.099	0.123	-0.024
	0.25	0.885	0.903	-0.018
	1.75	0.888	0.892	-0.007
	5.25	0.053	0.039	-0.006
	6.75	0.016	0.021	-0.005
	11.5	0	0.004	-0.004
	6.25	0.023	0.025	-0.002
	-1	1	1	0
	7.75	0.007	0.004	0.003
	7.25	0.016	0.013	0.003
	6.25	0.023	0.025	-0.002
	-1	1	0	0
	13	0	0	0
	9	0.007	0.004	0.003
	7.25	0.016	0.013	0.003
	6.25	0.023	0.025	-0.002
	7.75	0.016	0.008	0.008

Test result

Table S4. Coefficient in LASSO Logistics model

Variables in the LASSO-Logistics	Coefficient	
	min S	1- s.e.
Intercept	-4.708	-4.266
ACOT1	0.318	0.184
CD166	0.231	0.092
B7H3	0.298	0.150
CXCL12	0.275	0.178
HLAA	0.294	0.146
CD87	-0.227	-0.106
HLAB	-0.287	-0.164
TRAF1	-0.215	-0.069
CXCL13	0.157	
PDL1	0.144	
TRAF2	-0.014	
FADS2	0.146	
FADS6	0.080	
PPT2	0.074	

min S, minimum S; 1-s.e., 1- standard error

Table S5. Compound score of 10 patients with gut microbiota in 16S sequencing

	ACOT1	CD166	B7-H3	CXCL12	HLA-A	CD87	HLA-B	TRAF1	Compound Score
EBVaGC1	1	1	1	1	1	0	1	0	0.024602488
EBVaGC2	1	1	1	1	1	0	0	0	0.028860461
EBVaGC3	1	1	0	1	1	1	0	0	0.022488687
EBVaGC4	0	1	1	1	1	0	0	0	0.02412708
EBVnGC1	1	0	1	1	0	1	0	0	0.02063335
EBVnGC2	0	1	1	0	0	1	1	1	0.012579878
EBVnGC3	1	0	1	1	0	0	1	0	0.019493325
EBVnGC4	0	1	0	0	1	1	1	1	0.012530288
EBVnGC5	1	0	1	0	0	0	1	1	0.015292273
EBVnGC6	1	0	0	0	0	1	1	1	0.011879423

Table S6. Univariate and Multivariate Cox Proportional Hazard Model in subgroup of EBnGC.

Clinical parameters	Univariate		Multivariate	
	HR (95%CI)	P value	HR(95%CI)	P value
Age (≥ 60 vs. < 60)	0.97 (0.80, 1.18)	0.776	0.78 (0.64, 0.95)	0.015*
TNM stage (III-IV vs. I-II)	1.14 (0.89, 1.47)	0.229	1.06 (0.83, 1.37)	0.634
Lauren type (Diffuse/Mix vs. Intestinal)	1.80 (1.47, 2.22)	$< 0.01^*$	1.54 (1.24, 1.91)	$< 0.01^*$
Chemotherapy (Absent vs. Present)	1.06 (0.87, 1.30)	0.545	1.06 (0.88, 1.29)	0.537
Compound score (high vs. low)	3.15 (2.57, 3.86)	$< 0.01^*$	3.00 (2.45, 3.70)	$< 0.01^*$

* Statistically significant

Table S7. Univariate and Multivariate Cox Proportional Hazard Model in subgroup of EBaGC.

Clinical parameters	Univariate		Multivariate	
	HR (95%CI)	P value	HR(95%CI)	P value
Age (≥ 60 vs. < 60)	0.79 (0.45, 1.38)	0.397	0.68 (0.35, 1.32)	0.256
TNM stage (III-IV vs. I-II)	0.75 (0.35, 1.61)	0.459	1.17 (0.53, 2.60)	0.701
Lauren type (Diffuse/Mix vs. Intestinal)	1.24 (0.65, 2.38)	0.509	0.99 (0.47, 2.07)	0.978
Chemotherapy (Absent vs. Present)	2.57 (1.38, 4.78)	0.030*	2.41 (1.16, 4.98)	0.018*
Compound score (high vs. low)	2.84 (1.53, 5.26)	0.010*	3.30 (1.70, 6.41)	$< 0.01^*$

* Statistically significant