



Figure S1 Somatic mutation profiles of GGOs. (A) Somatic mutation profiles of GGOs for mutated genes detected by MutSigCV.

**Table S1** Clinicopathological features of enrolled patients

Characteristics	AIS (n=10)	MIA (n=21)	IAC (n=6)
Gender			
Male	6 (60.0%)	10 (48.0%)	1 (17.0%)
Female	4 (40.0%)	11 (52.0%)	5 (83.0%)
Smoking status			
Non-smokers	3 (30.0%)	8 (38.0%)	2 (33.3%)
Current/ever-smokers	7 (70.0%)	13 (62.0%)	4 (66.7%)

MIA, minimally invasive adenocarcinoma; AIS, adenocarcinoma in situ; IAC, invasive adenocarcinoma.

**Table S2 XXX**

Tumor_Sample_Barcode	Variants	TMB	Group
GGO17_T1	101	3.022769324	GGO
GGO35_T2	78	2.334415914	GGO
GGO20_T1	73	2.184773868	GGO
GGO31_T1	64	1.915418186	GGO
GGO3_T1	63	1.885489776	GGO
GGO5_T1	61	1.825632958	GGO
GGO6_T1	60	1.795704549	GGO
GGO14_T1	60	1.795704549	GGO
GGO18_T1	58	1.735847731	GGO
GGO2_T1	57	1.705919322	GGO
GGO22_T1	55	1.646062503	GGO
GGO23_T1	54	1.616134094	GGO
GGO35_T1	53	1.586205685	GGO
GGO30_T5	52	1.556277276	GGO
GGO9_T3	51	1.526348867	GGO
GGO35_T3	51	1.526348867	GGO
GGO16_T1	50	1.496420458	GGO
GGO1_T1	49	1.466492048	GGO
GGO13_T2	44	1.316850003	GGO
GGO19_T2	43	1.286921593	GGO
GGO13_T1	41	1.227064775	GGO
GGO21_T1	36	1.077422729	GGO
GGO21_T2	34	1.017565911	GGO
GGO34_T1	33	0.987637502	GGO
GGO36_T1	32	0.957709093	GGO

**Table S2** (continued)

Table S2 (continued)

Tumor_Sample_Barcode	Variants	TMB	Group
GGO30_T4	31	0.927780684	GGO
GGO25_T2	31	0.927780684	GGO
GGO37_T1	31	0.927780684	GGO
GGO28_T1	30	0.897852275	GGO
GGO19_T1	30	0.897852275	GGO
GGO7_T1	27	0.808067047	GGO
GGO25_T1	25	0.748210229	GGO
GGO37_T11	25	0.748210229	GGO
GGO7_T2	24	0.71828182	GGO
GGO15_T1	24	0.71828182	GGO
GGO37_T2	24	0.71828182	GGO
GGO21_T3	23	0.68835341	GGO
GGO21_T4	23	0.68835341	GGO
GGO29_T1	22	0.658425001	GGO
GGO27_T1	22	0.658425001	GGO
GGO37_T10	21	0.628496592	GGO
GGO32_T1	20	0.598568183	GGO
GGO8_T1	20	0.598568183	GGO
GGO26_T2	20	0.598568183	GGO
GGO37_T5	18	0.538711365	GGO
GGO26_T1	17	0.508782956	GGO
GGO34_T3	15	0.448926137	GGO
GGO37_T6	15	0.448926137	GGO
GGO9_T1	14	0.418997728	GGO
GGO10_T3	14	0.418997728	GGO
GGO30_T1	13	0.389069319	GGO
GGO34_T2	13	0.389069319	GGO
GGO36_T2	13	0.389069319	GGO
GGO37_T9	13	0.389069319	GGO
GGO4_T1	12	0.35914091	GGO
GGO11_T1	12	0.35914091	GGO
GGO37_T4	12	0.35914091	GGO
GGO4_T2	11	0.329212501	GGO
GGO31_T2	11	0.329212501	GGO
GGO10_T1	11	0.329212501	GGO

Table S2 (continued)

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Tumor_Sample_Barcode	Variants	TMB	Group
GGO32_T2	10	0.299284092	GGO
GGO9_T2	10	0.299284092	GGO
GGO10_T2	10	0.299284092	GGO
GGO37_T7	10	0.299284092	GGO
GGO24_T2	9	0.269355682	GGO
GGO34_T5	9	0.269355682	GGO
GGO37_T3	9	0.269355682	GGO
GGO37_T8	9	0.269355682	GGO
GGO30_T2	8	0.239427273	GGO
GGO30_T3	8	0.239427273	GGO
GGO24_T1	8	0.239427273	GGO
GGO5_T2	7	0.209498864	GGO
GGO12_T1	7	0.209498864	GGO
GGO3_T2	5	0.149642046	GGO
GGO33_T2	5	0.149642046	GGO
GGO34_T4	3	0.089785227	GGO
GGO33_T1	2	0.059856818	GGO
GGO37_T12	2	0.059856818	GGO
GGO33_T3	1	0.029928409	GGO
Median		0.658425001	
Max		3.022769324	
mine		0.029928409	
Average		0.822841831	

Table S3 Distribution of different pathological subtypes in three distinct immune-microenvironment regarding PD-L1 and CD8

Type I	AIS (n=4)	IAC (n=1)	MIA (n=13)
Dual positive	1 (25%)	0	2 (15.0%)
Type II (PD-L1+/CD8-)	0	0	0
Type III (PD-L1-/CD8+)	1 (25.0%)	1 (100.0%)	5 (38.0%)
Type IV (Dual negative)	2 (50.0%)	0	6 (46.0%)

AIS, adenocarcinoma in situ; MIA, minimally invasive adenocarcinoma; IAC, invasive adenocarcinoma.