

**Table S1** Characteristics of ESCC and EAC patients

Characteristics	ESCC, n (%)	EAC, n (%)
Total	75 (100.0)	78 (100.0)
Survival		
Alive	54 (72.0)	39 (50.0)
Dead	21 (28.0)	39 (50.0)
Age		
≤65 years	58 (77.3)	36 (46.2)
>65 years	17 (22.7)	42 (53.8)
Sex		
Male	65 (86.7)	67 (85.9)
Female	10 (13.3)	11 (14.1)
Stage		
Stage I	1 (1.3)	2 (2.6)
Stage II	18 (24.0)	3 (3.8)
Stage III	10 (13.3)	7 (9.0)
Stage IV	4 (5.3)	5 (6.4)
Stage X	42 (56.0)	61 (78.2)
Tumor (T)		
T1	7 (9.3)	20 (25.6)
T2	26 (34.7)	10 (12.8)
T3	37 (49.3)	35 (44.9)
T4	3 (4.0)	1 (1.3)
Tx	2 (2.7)	12 (15.4)
Metastasis (M)		
M0	66 (88.0)	50 (64.1)
M1	3 (4.0)	5 (6.4)
Mx	6 (8.0)	23 (29.5)
Lymph node (N)		
N0	43 (57.3)	19 (24.4)
N1	23 (30.7)	37 (47.4)
N2	5 (6.7)	4 (5.1)
N3	1 (1.3)	5 (6.4)
N4	3 (4.0)	13 (16.7)

**Table S2** Lasso regression coefficients of IRGPs in ESCC and EAC

Gene pairs	Coefficient
ESCC	
ADCYAP1R1 EPO	0.39890181
ADM JAG2	0.60740626
AGTR2 SEMG1	0.39046504
AR SCG2	-0.7027797
CCL4L2 IL31RA	0.40931681
CCL5 IGHG3	0.45963646
CCR8 IGLV1-36	-0.3796451
CSF3 HNF4G	-0.3826402
CTSE KIR2DL4	-0.2659804
DEFA5 FCN2	0.78567696
DKK1 NR4A3	-0.3713388
EGFR STAT1	-0.6977208
GCGR GLP1R	-1.5148802
IFNG IL13RA2	0.13426929
IL19 NR0B2	-1.1132949
IL33 LIFR	0.23463465
JAG2 PLAUR	-0.3432173
PDGFD TGFB2	0.52901538
SEMA5B TGFB2	0.53657821
EAC	
ACKR1 IDO1	-0.1194319
AGTR1 FGF5	-0.1304876
BPIFA2 CXCR1	0.03742268
CCL24 OSM	-0.0312613
CCL26 VIPR2	0.35557189
CMTM5 GKN1	0.08567827
CMTM7 CXCL5	-0.2460852
CTSG TRBV3-1	-0.3191845
CXCL5 IL33	0.10684079
CXCR1 PROK2	-0.2091523
ESM1 PTGER2	0.2462026
FGF5 VIPR2	0.10719466
FPR2 INHBE	-0.2394095
GPER1 IL11	-0.1534362
GPER1 PTGDR2	-0.312505
GPER1 VGF	-0.0160096
RXFP3 TRAV2	0.32288024