

**Table S1** All primers used in this study

Gene	Forward (5'-3')	Reverse (5'-3')
<i>GAPDH</i>	GGAGCGAGATCCCTCCAAAAT	GGCTGTTGTCATACTTCTCATGG
<i>ADORA2A</i>	CATGCTAGGTTGGAACAACCTGC	AGATCCGCAAATAGACACCCA
<i>TNFRSF18</i>	ACCCAGTTCGGGTTTCTCAC	CCAGATGTGCAGTCCAAGC
<i>SLC9A3-AS1</i>	CGAGAGAGGGCAGCGGCTAGT	TAACTTTCCAAGGCACCCAGCA
<i>AL139287.1</i> (chromosome 1: 1,317,581–1,318,689)	AACGGGGCAGAAACAACACT	TTGTTACCCAGAGCGAGACG
<i>SNHG12</i>	GAAAAAGCACACCAGCTATTGG	CGGGATCTCTGTAGACTAAGTCAGT

**Table S2** Differential analysis of ICG mRNA expressions in PRAD

Gene	Normal (N=52), mean ± SD	Tumor (N=496), mean ± SD	P value
<i>CD40</i>	3.39±0.47	2.35±0.79	1.40e-23
<i>CX3CL1</i>	4.24±0.73	3.44±0.97	2.90e-10
<i>TNFRSF14</i>	3.41±0.46	3.89±0.62	1.70e-09
<i>VTCN1</i>	1.94±1.03	0.89±0.80	1.70e-09
<i>TNFRSF18</i>	0.83±0.46	1.31±0.75	5.80e-09
<i>EDNRB</i>	2.98±1.19	1.86±0.90	1.80e-08
<i>CD274</i>	0.76±0.28	0.54±0.31	8.70e-07
<i>CTLA4</i>	0.33±0.30	0.57±0.52	4.90e-06
<i>CD276</i>	4.12±0.70	4.59±0.63	1.70e-05
<i>IL2RA</i>	0.29±0.27	0.47±0.39	4.70e-05
<i>ADORA2A</i>	0.04±0.03	0.07±0.05	5.10e-05
<i>CXCL10</i>	2.20±1.28	3.01±1.28	6.40e-05
<i>CXCL9</i>	1.71±1.13	2.33±1.27	4.70e-04
<i>IL1A</i>	0.12±0.17	0.04±0.08	1.10e-03
<i>ENTPD1</i>	1.95±0.53	1.70±0.42	2.00e-03
<i>TLR4</i>	1.78±0.76	1.44±0.67	2.80e-03
<i>CD80</i>	0.08±0.07	0.11±0.14	4.10e-03
<i>IL12A</i>	0.18±0.13	0.13±0.12	5.50e-03
<i>TNFRSF9</i>	0.11±0.14	0.17±0.20	7.90e-03
<i>TIGIT</i>	0.30±0.29	0.42±0.43	8.20e-03
<i>BTN3A1</i>	2.72±0.56	2.50±0.59	8.30e-03
<i>BTN3A2</i>	2.45±0.66	2.20±0.69	0.01
<i>CD28</i>	0.43±0.37	0.57±0.46	0.01
<i>ARG1</i>	0.18±0.11	0.23±0.30	0.02
<i>IFNA1</i>	0.01±0.02	5.3e-3±0.02	0.02
<i>KIR2DL3</i>	4.8e-3±7.9e-3	0.01±0.07	0.02
<i>LAG3</i>	1.19±0.48	1.02±0.51	0.02
<i>PDCD1</i>	0.46±0.30	0.57±0.44	0.02
<i>TNFRSF4</i>	0.74±0.46	0.91±0.53	0.02
<i>VEGFA</i>	4.16±1.34	3.68±1.28	0.02
<i>ICAM1</i>	2.39±0.84	2.65±0.91	0.04
<i>TGFB1</i>	3.45±0.54	3.29±0.70	0.05
<i>HMGB1</i>	4.75±0.30	4.67±0.31	0.06
<i>ICOSLG</i>	0.15±0.12	0.18±0.15	0.06
<i>IL1B</i>	0.86±0.70	0.67±0.63	0.06
<i>VEGFB</i>	5.71±0.36	5.61±0.57	0.07
<i>CD27</i>	1.04±0.62	1.20±0.75	0.08
<i>ICOS</i>	0.24±0.28	0.31±0.37	0.09
<i>TNFSF9</i>	0.36±0.27	0.43±0.41	0.09
<i>IDO1</i>	1.04±0.69	1.21±0.80	0.10
<i>CCL5</i>	3.50±0.92	3.28±1.05	0.11
<i>HAVCR2</i>	1.01±0.48	1.13±0.48	0.11
<i>SELP</i>	2.31±0.81	2.13±0.72	0.12
<i>IL10</i>	0.23±0.21	0.18±0.18	0.14
<i>PRF1</i>	1.26±0.48	1.16±0.57	0.14
<i>IL4</i>	0.07±0.08	0.08±0.10	0.15
<i>KIR2DL1</i>	0.01±0.02	0.02±0.18	0.21
<i>TNF</i>	0.32±0.28	0.27±0.29	0.21
<i>ITGB2</i>	2.24±0.89	2.39±0.76	0.23
<i>BTLA</i>	0.16±0.18	0.19±0.25	0.39
<i>CD70</i>	0.11±0.10	0.12±0.15	0.41
<i>CD40LG</i>	0.45±0.43	0.48±0.45	0.60
<i>SLAMF7</i>	0.84±0.62	0.87±0.61	0.71
<i>GZMA</i>	1.69±0.75	1.73±0.82	0.74
<i>IL13</i>	0.04±0.10	0.04±0.11	0.75
<i>IL2</i>	0.05±0.06	0.06±0.07	0.83
<i>IFNG</i>	0.14±0.20	0.14±0.21	0.88
<i>IFNA2</i>	4.8e-4±3.4e-3	5.2e-4±4.7e-3	0.93
<i>TNFSF4</i>	0.99±0.39	0.99±0.38	0.94

ICG, immune checkpoint gene; PRAD, prostate adenocarcinoma; SD, standard deviation.

**Table S3** KM analysis of the effect of ICGs on metastatic-free survival in PRAD patients

Tag	HR	Low 95% CI	High 95% CI	KM plot P value
<i>TGFB1</i>	1.054582268	1.022246527	1.087940854	4.72e-05
<i>ADORA2A</i>	3324.991614	157.6079854	70145.99673	0.00033839
<i>IL2RA</i>	1.339540597	1.063273361	1.687589548	0.003618762
<i>TNFRSF18</i>	1.131329879	1.066381875	1.200233541	0.006642694
<i>TNFRSF4</i>	1.085795747	0.949626789	1.241490254	0.008498527
<i>CD80</i>	3.752960922	1.218508332	11.55898184	0.039370527
<i>ENTPD1</i>	1.080019714	0.91966257	1.268337564	0.068370467
<i>TNFRSF9</i>	1.808477936	0.970339746	3.370564238	0.078411171
<i>LAG3</i>	1.023058401	0.914846933	1.144069521	0.092828317
<i>EDNRB</i>	0.965411453	0.898675386	1.037103372	0.120055792
<i>TNFRSF14</i>	1.009893304	0.986078293	1.034283477	0.122982491
<i>CD276</i>	1.025406766	1.012854124	1.038114978	0.143037633
<i>CTLA4</i>	1.018792362	0.893793509	1.16127256	0.164353401
<i>TIGIT</i>	1.02357756	0.846594993	1.237558727	0.224441895
<i>CD28</i>	0.854153132	0.619347398	1.17797794	0.229466013
<i>CXCL10</i>	1.00146282	0.98806998	1.015037193	0.256739434
<i>BTN3A1</i>	1.024404007	0.955300287	1.098506495	0.265307194
<i>ICAM1</i>	0.992778917	0.956511457	1.030421509	0.288042325
<i>CD40</i>	1.028697501	0.972262899	1.088407827	0.300913292
<i>CX3CL1</i>	0.99678786	0.976015811	1.018001991	0.323839532
<i>VEGFA</i>	1.007038737	0.998575097	1.015574112	0.334767669
<i>CD274</i>	1.467580476	1.08373725	1.987375125	0.418858414
<i>BTN3A2</i>	0.970460694	0.895994137	1.051116207	0.479852877
<i>TLR4</i>	0.828102917	0.706583462	0.9705215	0.655617075
<i>IL12A</i>	2.277822979	0.346271552	14.98383997	0.674556297
<i>ARG1</i>	1.067015091	0.979651383	1.162169751	0.746415119
<i>PDCD1</i>	1.089071243	0.905973788	1.309172725	0.792244647
<i>IL1A</i>	0.514238407	0.015784191	16.75354413	0.84324163
<i>VTCN1</i>	0.957647065	0.852495597	1.07576849	0.891041988
<i>CXCL9</i>	1.000565165	0.986185799	1.015154192	0.93564176
<i>KIR2DL3</i>	2.204636585	0.117323437	41.42754934	NA
<i>IFNA1</i>	0.00502956	1.46e-11	1734400.293	NA

ICGs, immune checkpoint genes; PRAD, prostate adenocarcinoma; KM, Kaplan-Meier; HR, hazard ratio; CI, confidence interval; NA, not available.