

SUPPLEMENTARY TABLES

Supplementary Table 3. The condition number of a matrix(K) of the PIGs in for data series.

Series	Condition number of a matrix(K)	If K < 100
GSE32894	14.27	Yes
GSE32548	13.59	Yes
GSE13507	7.09	Yes
GSE48075	9.74	Yes
TCGA	27.16	Yes

If $K < 100$, the degree of **collinearity** is very small; If $100 \leq k \leq 1000$, there is a general degree of **collinearity**; If $k > 1000$, there is a serious **collinearity**.

Supplementary Table 4. Baseline information of 30 patients with UC.

Characteristic	Case number (percentage)
Gender	
Male	23 (76.7%)
Female	7 (23.3%)
Age	
<60	8 (26.7%)
≥60	22 (73.3%)
Stage	
NMIBC (Ta/T1/Tis)	18 (60.0%)
MIBC (T2–T4)	12 (40.0%)
Disease Free Months	
<20	5 (16.7%)
≥20, <40	13 (43.3%)
≥40	12 (40%)

Supplementary Table 5. Primers used for quantitative real time-PCR.

TNFRSF6B	Forward primer	GTACGCGGAGTGGCAGAAA
	Reverse primer	CAGAGGACGTTGCAGTAGC
CXCL2	Forward primer	TCATAGCCACACTCAAGAAT
	Reverse primer	AGGAACAGCCACCAATAAG
PSMD2	Forward primer	TGCTCGTGGAACGACTAGG
	Reverse primer	CAGTTTGCCATAGTGTGGACG
VEGFC	Forward primer	GAGGAGCAGTTACGGTCTGTG
	Reverse primer	TCCTTTCCTTAGCTGACACTTGT
GRB2	Forward primer	CTGGGTGGTGAAGTTCAATTCT
	Reverse primer	GTTCTATGTCCCGCAGGAATATC
CMTM1	Forward primer	AACCTGAGTCATCCGAGGCA
	Reverse primer	CAGTCTCCGTTGTTTCAAGT
CBL	Forward primer	TAGGCGAAACCTAACCAAACCTG
	Reverse primer	AGAGTCCACTTGGAAAGATTCCCT
CYR61	Forward primer	ACCGCTCTGAAGGGGATCT

	Reverse primer	ACTGATGTTTACAGTTGGGCTG
SDC1	Forward primer	ACGGCTATTCCCACGTCTC
	Reverse primer	TCTGGCAGGACTACAGCCTC
CTSE	Forward primer	CAGTCCAGCACATACAGCCA
	Reverse primer	GCTCCAATGATCCCGGACAA
ACTIN	Forward primer	CACCATTGGCAATGAGCGGTTTC
	Reverse primer	AGGTCTTTGCGGATGTCCACGT

Supplementary Table 6. Information of 28 IRGs selected by RSH-VH.

Probe_ID	Symbol	ENSG_ID	Beta	HR (95% CI for HR)	Wald. test	p-value	Depth	rel. freq	Importance	EBTREZ_ ID
ILMN_1670918	INSR	ENSG00000171105	-1.6	0.21 (0.072-0.6)	8.3	0.0039	6.547	22	0.001	3643
ILMN_1814022	NR1H3	ENSG00000025434	-0.96	0.38 (0.23-0.64)	13	0.00028	6.003	23	0.00085	10062
ILMN_2387224	CTSE	ENSG00000196188	-0.93	0.4 (0.24-0.65)	13	0.00029	5.736	22	0.00289	1510
ILMN_1815308	SDC1	ENSG00000115884	-0.75	0.47 (0.31-0.71)	13	0.00026	6.395	22	0.00297	6382
ILMN_1799887	CTSE	ENSG00000196188	-0.63	0.53 (0.39-0.72)	17	3.4E-05	6.096	21	0.00625	1510
ILMN_2364384	PPARG	ENSG00000132170	-0.45	0.63 (0.5-0.8)	15	9.7E-05	6.941	22	0.00061	5468
ILMN_2355486	FAM3B	ENSG00000183844	-0.38	0.69 (0.59-0.81)	21	3.9E-06	6.875	26	0.00069	54097
ILMN_1787897	CXCL1	ENSG00000163739	0.34	1.4 (1.1-1.8)	7.9	0.005	7.136	22	-0.0001	2919
ILMN_2374449	SPP1	ENSG00000118785	0.35	1.4 (1.2-1.7)	12	0.00058	6.746	27	0.00046	6696
ILMN_1785699	PTHLH	ENSG00000087494	0.45	1.6 (1.2-2)	11	0.00073	6.673	21	0.0004	5744
ILMN_1774685	IL24	ENSG00000162892	0.45	1.6 (1.3-2)	15	8.8E-05	6.82	20	0.00083	11009
ILMN_1791726	TUBB3	ENSG00000258947	0.48	1.6 (1.3-2.1)	15	0.00013	6.618	21	0.00114	10381
ILMN_1682636	CXCL2	ENSG00000081041	0.49	1.6 (1.3-2.1)	17	4.7E-05	6.421	22	0.00135	2920
ILMN_2331231	TNFRSF6B	ENSG00000243509	0.56	1.8 (1.4-2.2)	24	1.2E-06	6.535	20	0.00125	8771
ILMN_2188264	CYR61/CNN1	ENSG00000142871	0.64	1.9 (1.4-2.5)	20	6.6E-06	6.104	24	0.00295	3491
ILMN_1696360	CTSB	ENSG00000164733	0.65	1.9 (1.2-3)	8	0.0046	6.873	21	0.00037	1508
ILMN_1691884	STC2	ENSG00000113739	0.66	1.9 (1.5-2.6)	21	4.6E-06	6.024	25	0.00066	8614
ILMN_1701204	VEGFC	ENSG00000150630	0.72	2 (1.3-3.1)	11	0.00077	5.99	21	0.00145	7424
ILMN_2382906	PLCG1	ENSG00000124181	0.85	2.3 (1.4-4.1)	9.2	0.0024	6.095	21	0.00099	5335
ILMN_1703178	SCG2	ENSG00000171951	0.91	2.5 (1.5-4)	14	0.00018	5.776	24	-0.0003	7857
ILMN_1758542	BMP1	ENSG00000168487	0.97	2.6 (1.7-4.1)	19	1.3E-05	6.722	22	0.0006	649
ILMN_2181968	CBL	ENSG00000110395	1	2.8 (1.3-5.9)	7.4	0.0063	6.309	24	0.00242	867
ILMN_1657968	MAP2K2	ENSG00000126934	1.1	2.9 (1.3-6.3)	6.8	0.0089	6.806	24	7.5E-05	5605
ILMN_1725814	IL24	ENSG00000162892	1.2	3.4 (1.7-7)	12	0.00065	6.851	21	2.4E-05	11009
ILMN_1748797	GRB2	ENSG00000177885	1.3	3.5 (1.6-7.6)	10	0.0016	6.539	22	0.00164	2885
ILMN_2328363	CMTM1	ENSG00000089505	1.3	3.8 (1.7-8.6)	11	0.0011	5.758	21	0.0022	113540
ILMN_2128128	SHFM1	ENSG00000127922	1.5	4.4 (1.4-14)	6.6	0.0099	6.167	21	0.00035	NA
ILMN_1712432	PSMD2	ENSG00000175166	1.9	6.6 (3.1-14)	23	1.5E-06	6.145	26	0.00135	5708
ILMN_1681515	CRLF1	ENSG00000006016	2	7.6 (2.1-28)	9.4	0.0022	6.328	22	0.00116	9244
ILMN_1707328	KLRC2	ENSG00000205809	5	150 (9.8-2300)	13	0.00032	6.556	21	3.3E-05	3822

Supplementary Table 8. Differential analysis of m6A modification peaks.

Symbol	logFC	P-value	Annotation	Gene ID	Transcript.ID	ENTREZ ID	GENENAME
INSR	1.439354567	0.000740458	3'UTR	ENSG00000171105.14	ENST000000601099.1	3643	insulin receptor
NR1H3	2.557239473	0.001460625	Promoter (≤1 kb)	ENSG00000025434.19	ENST000000495866.5	10062	nuclear receptor subfamily 1 group H

							member 3
CTSE	3.062398039	0.000505438	3'UTR	ENSG00000196188.12	ENST00000486757.1	1510	cathepsin E
SDC1	1.793082706	0.008954021	3'UTR	ENSG00000115884.11	ENST00000482879.5	6382	syndecan 1
PPARG	1.559761642	0.030422269	Promoter (2–3 kb)	ENSG00000132170.24	ENST00000682446.1	5468	peroxisome proliferator activated receptor gamma
FAM3B	1.978350189	0.035157454	Promoter (2–3 kb)	ENSG00000183844.17	ENST00000398646.3	54097	FAM3 metabolism regulating signaling molecule B
SPP1	2.465630299	0.00949005	Promoter (≤1 kb)	ENSG00000118785.15	ENST00000505146.1	6696	secreted phosphoprotein 1
CXCL2	2.773177463	0.003233683	Promoter (≤1 kb)	ENSG00000081041.9	ENST00000508487.3	2920	C-X-C motif chemokine ligand 2
CTSB	1.459450688	0.002211906	3'UTR	ENSG00000164733.23	ENST00000530290.5	1508	cathepsin B
PLCG1	2.46654589	4.95E-05	3'UTR	ENSG00000124181.15	ENST00000244007.7	5335	phospholipase C gamma 1
BMP1	1.781179922	0.016151302	3'UTR	ENSG00000168487.20	ENST00000522332.1	649	bone morphogenetic protein 1
CBL	1.788575387	0.029705874	Promoter (≤1 kb)	ENSG00000110395.8	ENST00000637974.1	867	Cbl proto-oncogene
MAP2K2	1.999922514	0.02765859	Exon (ENST00000262948.10/ ENSG00000126934.15, exon 3 of 11)	ENSG00000126934.15	ENST00000602167.5	5605	mitogen-activated protein kinase 2
GRB2	2.137806528	0.009303183	Promoter (1–2 kb)	ENSG00000177885.15	ENST00000581959.1	2885	growth factor receptor bound protein 2
CMTM1	2.946544842	0.001246492	Promoter (≤1 kb)	ENSG00000089505.18	ENST00000332695.11	113540	CKLF like MARVEL transmembrane domain containing 1
PSMD2	2.368671003	0.004369637	Promoter (≤1 kb)	ENSG00000175166.17	ENST00000445558.6	5708	proteasome 26S subunit ubiquitin receptor, non-ATPase 2
CRLF1	1.799564651	0.035473845	Promoter (≤1 kb)	ENSG00000006016.12	ENST00000594325.1	9244	cytokine receptor like factor 1