

Fig. S1 Functional enrichment analysis of 274 genes associated with TRPM4. **(a-b)** Bar chart and circle graph in GO Analysis. **(d-e)** Bar chart and tree plot in KEGG pathways.

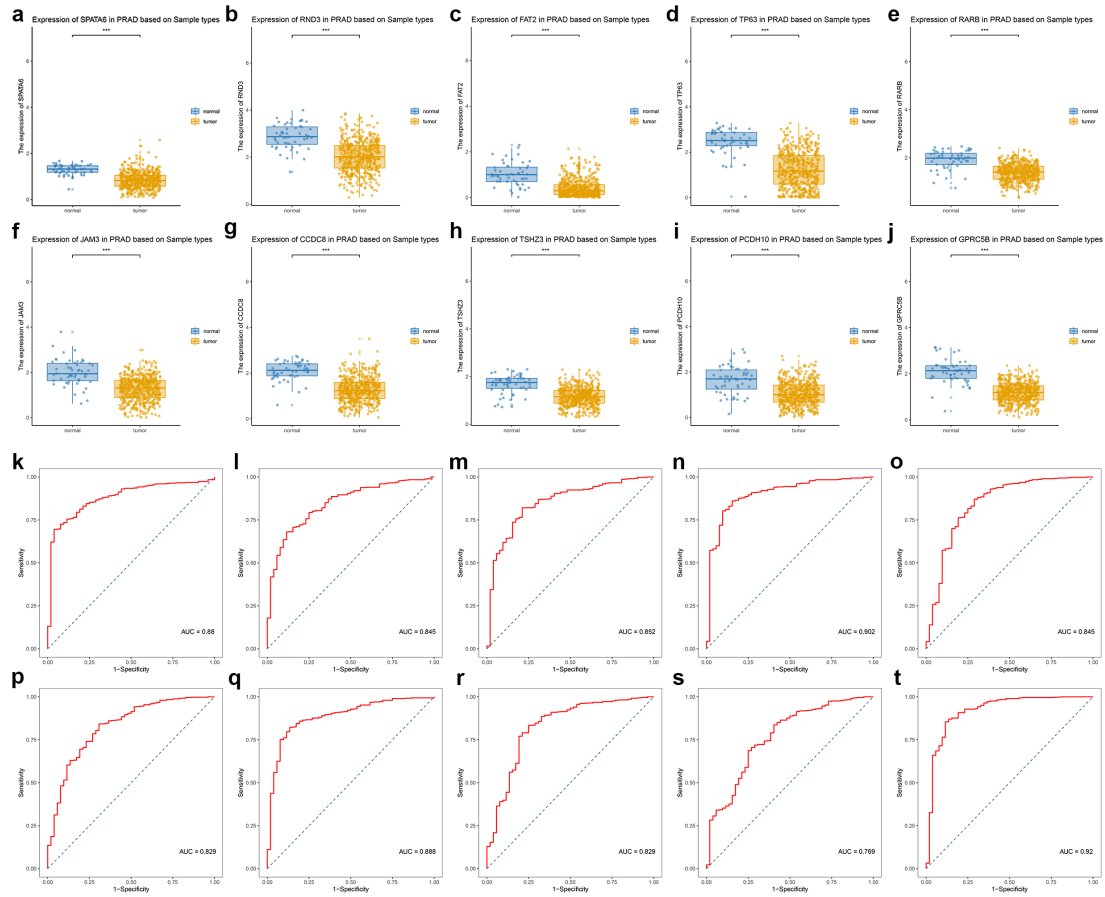


Fig. S2 Expression and diagnostic characteristics of 10 key genes in the TRSM. **(a-j)** Boxplot of expression levels for 10 key genes: **(a)** SPATA6, **(b)** RND3, **(c)** FAT2, **(d)** TP63, **(e)** RARB, **(f)** JAM3, **(g)** CCDC8, **(h)** TSHZ3, **(i)** PCDH10, and **(j)** GPRC5B. **(k-t)** ROC curve of 10 key genes: **(k)** SPATA6, **(l)** RND3, **(m)** FAT2, **(n)** TP63, **(o)** RARB, **(p)** JAM3, **(q)** CCDC8, **(r)** TSHZ3, **(s)** PCDH10, and **(t)** GPRC5B.

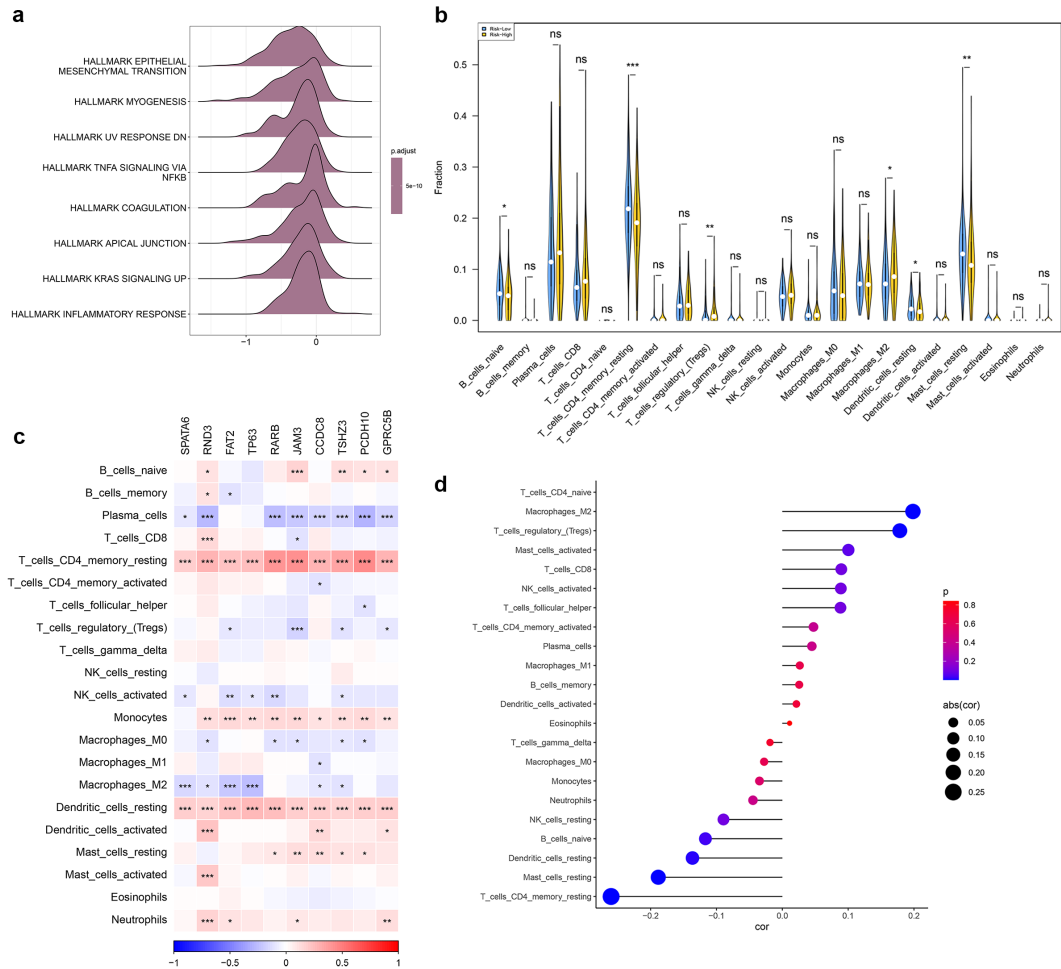


Fig. S3 Supplementary analysis of the relationship between TRSM and immune cell infiltration. **(a)** Ridge plot showing GO terms enriched in low-risk groups. **(b)** Quantification of the abundance of each immune cell type between high- and low- risk groups according to the CIBERSORT algorithm. **(c)** Association between TME-infiltrated cells and key genes of TRSM. **(d)** The relationship between TME-infiltrated cells and TRSM.

Table S1. Primer sequences of the qRT-PCR.

Genes	Primer sequences
SPATA6-F	GACTCTGCCTATGACAGTGACC
SPATA6-R	GCTGTTCTCAAAGATGGGTCCG
RND3-F	AATCACAGGCAGACGCCAGTGT
RND3-R	CCGACTGTAAAGCTGAGCATTCCG
FAT2-F	CACACTGACAGTCATGGTCCGA
FAT2-R	TGGTGTCAGGAACACTTGCCTC
TP63-F	CAGGAAGACAGAGTGTGCTGGT
TP63-R	AATTGGACGGCGGTTTCATCCCT
RARB-F	GGTTTCACTGGCTTGACCATCG
RARB-R	CCGTCTGAGAAAGTCATGGTGTC
JAM3-F	GCTGTGCATACAGACGTGGCTA
JAM3-R	TCCTCGTCAGTGCGGATGTAGT
CCDC8-F	GAGTTCAGCGACTTCGAGACCT
CCDC8-R	ATCATCCTCACTCTCCAGGTCCG
TSHZ3-F	CACCTACCATCACAACCCTGCT
TSHZ3-R	CGACTTCCTTCTTGACCTCCAC
PCDH10-F	TCTCCAACGGAAGCATTGTTGTC
PCDH10-R	CTATGTCGGCTTCTGGAATGC
GPRC5B-F	CAGGAGAACACGCCCAACTACT
GPRC5B-R	GGAAATCCTGCTGTTCCGGAGAG

Table S2. 274 genes associated with TRPM4 in PCa

Sodium-related	Gene	Cor	pvalue
TRPM4	SLC27A4	0.567	4.80259479725518e-44
TRPM4	GNB5	-0.528	1.90255025988146e-37
TRPM4	EIF5A	0.510	1.25791132545741e-34
TRPM4	INPP5B	-0.492	6.41638262827615e-32
TRPM4	ARHGEF17	-0.481	2.06613762878772e-30
TRPM4	PRDX4	0.476	9.38025279315996e-30
TRPM4	MECP2	-0.475	1.40067102029738e-29
TRPM4	ACSL4	-0.471	4.85885979396078e-29
TRPM4	AC116312.1	0.469	7.70581563371481e-29
TRPM4	ZSCAN25	-0.461	8.46915622789717e-28
TRPM4	DENND2B	-0.449	2.62565105211558e-26
TRPM4	ARHGEF40	-0.446	5.87321557339713e-26
TRPM4	ZFP36L2	-0.443	1.5698712978349e-25
TRPM4	AJUBA	-0.442	1.81704126549032e-25
TRPM4	MAPKBP1	-0.442	2.22842610946571e-25
TRPM4	XPC	-0.441	2.61191020834453e-25
TRPM4	SMAD7	-0.441	2.63015608648052e-25
TRPM4	PHC1	-0.439	4.13119778820147e-25
TRPM4	GPRASP1	-0.437	8.05561820536755e-25
TRPM4	KRT18P11	0.436	9.48951023464386e-25
TRPM4	KIRREL1	-0.433	2.20641112122622e-24
TRPM4	DUSP11	-0.432	2.79075694196167e-24
TRPM4	EPB41L2	-0.432	3.11103425698606e-24
TRPM4	CXorf38	-0.429	6.61178121286852e-24
TRPM4	AP006748.1	0.427	1.11991255139915e-23
TRPM4	RNF19A	-0.426	1.35932235885636e-23
TRPM4	PC	0.426	1.56427897498323e-23
TRPM4	EVC2	-0.426	1.63306215301507e-23
TRPM4	SPTAN1	-0.425	2.00262502645473e-23
TRPM4	EEF1AKMT4	0.424	2.50261193180171e-23
TRPM4	ALG8	0.424	2.64925353973793e-23
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TRPM4	JADE2	-0.423	3.13622779460307e-23
TRPM4	KSR1	-0.422	4.20787818555468e-23
TRPM4	NINL	-0.421	5.31253593750848e-23
TRPM4	ARHGEF2	-0.419	1.01912946100953e-22
TRPM4	GCOM1	-0.418	1.09528851965453e-22
TRPM4	PJA1	-0.416	2.00905544598306e-22
TRPM4	SYNGAP1	-0.415	2.33996122772639e-22
TRPM4	MDC1	-0.415	2.68552583565681e-22
TRPM4	STRADB	0.415	2.89736029797635e-22
TRPM4	FRY	-0.414	3.29747891132629e-22

TRPM4	LIX1L	-0.414	3.35445707587304e-22
TRPM4	LHFPL2	-0.413	3.99627687923218e-22
TRPM4	LAMB1	-0.413	4.33383608332565e-22
TRPM4	ARHGEF28	-0.413	4.57546761277926e-22
TRPM4	PLS3	-0.412	4.88878835983691e-22
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TRPM4	CORO1C	-0.408	1.4307698951158e-21
TRPM4	NOL4L	-0.407	1.80812779786987e-21
TRPM4	BTN2A1	-0.406	2.17757347431175e-21
TRPM4	ZFP92	-0.406	2.31414665727655e-21
TRPM4	RNF25	0.406	2.46154447592797e-21
TRPM4	C11orf95	-0.405	2.80521073666132e-21
TRPM4	SEMA5A	-0.403	4.51796216742725e-21
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TRPM4	IQCA1	-0.399	1.40521090190751e-20
TRPM4	MVB12B	-0.398	1.51866194885357e-20
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TRPM4	NCKAP5L	-0.396	2.69363699242569e-20
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TRPM4	COL27A1	-0.307	1.89079826288093e-12
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TRPM4	GJD3	-0.305	2.76940544274531e-12
TRPM4	ASB1	-0.305	2.9100065231444e-12
TRPM4	TRIM29	-0.305	2.9281049864192e-12
TRPM4	SLC3A2	0.304	3.16101911312819e-12
TRPM4	AL445524.1	0.304	3.3274314224685e-12

TRPM4	TSHZ3	-0.304	3.38521340423125e-12
TRPM4	KIF3C	-0.303	3.88993062457097e-12
TRPM4	STARD9	-0.303	4.10614606555079e-12
TRPM4	ATG101	0.303	4.11673390324446e-12
TRPM4	ARMCX4	-0.303	4.12632058492493e-12
TRPM4	CAMK4	-0.303	4.37414823085104e-12
TRPM4	TRPV4	-0.302	4.45750903708057e-12
TRPM4	SGCE	-0.302	4.87716211448966e-12
TRPM4	VPS9D1-AS1	0.302	4.90931172337474e-12
TRPM4	PRELID1P6	0.301	5.35648257900455e-12
TRPM4	AC090559.1	-0.301	6.00078218527129e-12
TRPM4	MPEG1	-0.300	6.40769214667466e-12
