

Table SI. Sequences of dsRNAs and PCR primers.

dsRNA/primer	Sequence (5'-3')
dsControl S	UUCUCCGAACGUGUCACGUTT
dsControl AS	ACGUGACACGUUCGGAGAATT
dsFOXF1-575 S	CCGCACUUGCGAUUUGCUATT
dsFOXF1-575 AS	UAGCAAAUCGCAAGUGCGGTT
dsFOXF1-446 S	GGCGCAUUAACACUUGCUCTT
dsFOXF1-446 AS	GAGCAAGUGUUAUUGCGCCTT
dsFOXF1-367 S	CUCUUUAAGCGCCCACCAATT
dsFOXF1-367 AS	UUGGUGGGCGCUAAAAGAGTT
dsFOXF1-69 S	UGGGAGGGCGAGAAAGAAATT
dsFOXF1-69 AS	UUUCUUUCUCGCCCUCCCATT
FOXF1 F	TATCTGCACCAGAACAGCCACAAC
FOXF1 R	ACTCCTTTCGGTCACACATGCT
GAPDH F	GTTCGTCATGGGTGTGAACCA
GAPDH R	AGTCCTTCCACGATACCAAAGT

S, sense; AS, antisense; F, forward; R, reverse; FOXF1, forkhead box F1.

Table SII. Original information of the protein microarray.

Position	ID	Histological type	Clinical type	H-score
A1	F03A0036-B30-C1	Tumor	Urothelium carcinoma	3
A2	F03A0036-B30-P1	Para-cancerous	Normal bladder mucosae	3
A3	F03A0037-B30-C1	Tumor	Urothelium carcinoma	2
A4	F03A0037-B30-P1	Para-cancerous	Normal bladder mucosae	60
A5	F03A0039-B30-C1	Tumor	Urothelium carcinoma	1
A6	F03A0039-B30-P1	Para-cancerous	Normal bladder mucosae	39
A7	F03A0040-B30-C1	Tumor	Urothelium carcinoma	5
A8	F03A0040-B30-P1	Para-cancerous	Normal bladder mucosae	100
A9	F03A0041-B30-C1	Tumor	Urothelium carcinoma	23
A10	F03A0041-B30-P1	Para-cancerous	Normal bladder mucosae	63
A11	F03A0043-B30-C1	Tumor	Urothelium carcinoma	24
A12	F03A0043-B30-P1	Para-cancerous	Normal bladder mucosae	43
A13	F03A0044-B30-C1	Tumor	Urothelium carcinoma	1
A14	F03A0044-B30-P1	Para-cancerous	Normal bladder mucosae	56
B1	F03A0045-B30-C1	Tumor	Urothelium carcinoma	3
B2	F03A0045-B30-P1	Para-cancerous	Normal bladder mucosae	75
B3	F03A0051-B30-C1	Tumor	Urothelium carcinoma	22
B4	F03A0051-B30-P1	Para-cancerous	Normal bladder mucosae	36
B5	F03A0061-B30-C1	Tumor	Urothelium carcinoma	6
B6	F03A0061-B30-P1	Para-cancerous	Normal bladder mucosae	25
B7	F03A0071-B30-C1	Tumor	Urothelium carcinoma	18
B8	F03A0071-B30-P1	Para-cancerous	Normal bladder mucosae	15
B9	F03A0074-B30-C1	Tumor	Urothelium carcinoma	6
B10	F03A0074-B30-P1	Para-cancerous	Normal bladder mucosae	55
B11	F03A0075-B30-C1	Tumor	Urothelium carcinoma	4
B12	F03A0075-B30-P1	Para-cancerous	Normal bladder mucosae	20
B13	F03A0076-B30-C1	Tumor	Urothelium carcinoma	0
B14	F03A0076-B30-P1	Para-cancerous	Normal bladder mucosae	60
C1	F03A0078-B30-C1	Tumor	Urothelium carcinoma	13
C2	F03A0078-B30-P1	Para-cancerous	Normal bladder mucosae	35
C3	F03A0079-B30-C1	Tumor	Urothelium carcinoma	20
C4	F03A0079-B30-P1	Para-cancerous	Normal bladder mucosae	40
C5	F03A0080-B30-C1	Tumor	Urothelium carcinoma	12
C6	F03A0080-B30-P1	Para-cancerous	Normal bladder mucosae	16
C7	F03A0083-B30-C1	Tumor	Urothelium carcinoma	15
C8	F03A0083-B30-P1	Para-cancerous	Normal bladder mucosae	37
C9	F03A0084-B30-C1	Tumor	Urothelium carcinoma	8
C10	F03A0084-B30-P1	Para-cancerous	Normal bladder mucosae	14
C11	F03A0088-B30-C1	Tumor	Urothelium carcinoma	6
C12	F03A0088-B30-P1	Para-cancerous	Normal bladder mucosae	15
C13	F03A0091-B30-C1	Tumor	Urothelium carcinoma	0
C14	F03A0091-B30-P1	Para-cancerous	Normal bladder mucosae	100
D1	F03A0095-B30-C1	Tumor	Urothelium carcinoma	45
D2	F03A0095-B30-P1	Para-cancerous	Normal bladder mucosae	15
D3	F03A0102-B30-C1	Tumor	Urothelium carcinoma	2
D4	F03A0102-B30-P1	Para-cancerous	Normal bladder mucosae	45
D5	F03A0105-B30-C1	Tumor	Urothelium carcinoma	3
D6	F03A0105-B30-P1	Para-cancerous	Normal bladder mucosae	25
D7	F03A0108-B30-C1	Tumor	Urothelium carcinoma	4
D8	F03A0108-B30-P1	Para-cancerous	Normal bladder mucosae	22

D9	F03A0110-B30-C1	Tumor	Urothelium carcinoma	1
D10	F03A0110-B30-P1	Para-cancerous	Normal bladder mucosae	60
D11	F03A0112-B30-C1	Tumor	Urothelium carcinoma	4
D12	F03A0112-B30-P1	Para-cancerous	Normal bladder mucosae	5
D13	F03A0120-B30-C1	Tumor	Urothelium carcinoma	15
D14	F03A0120-B30-P1	Para-cancerous	Normal bladder mucosae	13
E1	F03A0121-B30-C1	Tumor	Urothelium carcinoma	27
E2	F03A0121-B30-P1	Para-cancerous	Normal bladder mucosae	25
E3	F03A0122-B30-C1	Tumor	Urothelium carcinoma	1
E4	F03A0122-B30-P1	Para-cancerous	Normal bladder mucosae	35
E5	F03A0123-B30-C1	Tumor	Urothelium carcinoma	33
E6	F03A0123-B30-P1	Para-cancerous	Normal bladder mucosae	60
E7	F03A0126-B30-C1	Tumor	Urothelium carcinoma	4
E8	F03A0126-B30-P1	Para-cancerous	Normal bladder mucosae	25
E9	F03A0127-B30-C1	Tumor	Urothelium carcinoma	9
E10	F03A0127-B30-P1	Para-cancerous	Normal bladder mucosae	45
E11	F03A0131-B30-C1	Tumor	Urothelium carcinoma	1
E12	F03A0131-B30-P1	Para-cancerous	Normal bladder mucosae	35
E13	F03A0133-B30-C1	Tumor	Urothelium carcinoma	15
E14	F03A0133-B30-P1	Para-cancerous	Normal bladder mucosae	110
F1	F03A0134-B30-C1	Tumor	Urothelium carcinoma	15
F2	F03A0134-B30-P1	Para-cancerous	Normal bladder mucosae	50
F3	F03A0141-B30-C1	tumor	Urothelium carcinoma	7
F4	F03A0141-B30-P1	Para-cancerous	Normal bladder mucosae	85
F5	F03A0218-B30-C1	Tumor	Urothelium carcinoma	3
F6	F03A0218-B30-P1	Para-cancerous	Normal bladder mucosae	12
F7	F03A0219-B30-C1	Tumor	Urothelium carcinoma	2
F8	F03A0219-B30-P1	Para-cancerous	Normal bladder mucosae	55
F9	F03A0220-B30-C1	Tumor	Urothelium carcinoma	8
F10	F03A0220-B30-P1	Para-cancerous	Normal bladder mucosae	24
F11	F03A0222-B30-C1	Tumor	Urothelium carcinoma	2
F12	F03A0222-B30-P1	Para-cancerous	Normal bladder mucosae	45
F13	F03A0224-B30-C1	Tumor	Urothelium carcinoma	11
F14	F03A0224-B30-P1	Para-cancerous	Normal bladder mucosae	25
G1	F03A0228-B30-C1	Tumor	Urothelium carcinoma	6
G2	F03A0228-B30-P1	Para-cancerous	Normal bladder mucosae	8
G3	F03A0230-B30-C1	Tumor	Urothelium carcinoma	2
G4	F03A0230-B30-P1	Para-cancerous	Normal bladder mucosae	7
G5	F03A0231-B30-C1	Tumor	Urothelium carcinoma	19
G6	F03A0231-B30-P1	Para-cancerous	Normal bladder mucosae	27
G7	F03A0347-B30-C1	Tumor	Urothelium carcinoma	0
G8	F03A0347-B30-P1	Para-cancerous	Normal bladder mucosae	36
G9	F03A0038-B30-C1	Tumor	Urothelium carcinoma	10
G10	F03A0058-B30-C1	Tumor	Urothelium carcinoma	12
G11	F03A0059-B30-C1	Tumor	Urothelium carcinoma	33
G12	F03A0060-B30-C1	Tumor	Urothelium carcinoma	3
G13	F03A0066-B30-C1	Tumor	Urothelium carcinoma	1
G14	F03A0068-B30-C1	Tumor	Urothelium carcinoma	12
H1	F03A0090-B30-C1	Tumor	Urothelium carcinoma	5
H2	F03A0097-B30-C1	Tumor	Urothelium carcinoma	5
H3	F03A0103-B30-C1	Tumor	Urothelium carcinoma	6
H4	F03A0124-B30-C1	Tumor	Urothelium carcinoma	5

H5	F03A0137-B30-C1	Tumor	Urothelium carcinoma	3
H6	F03A0216-B30-C1	Tumor	Urothelium carcinoma	32
H7	F03A0221-B30-C1	Tumor	Urothelium carcinoma	42

Table SIII. Clinicopathological features of the patients in the Ruijin cohort.

Date of surgery	Status	Latest follow-up	Follow-up (months)	Sex	Age, years	Papillary	Grade	Pathological grade	T stage	N stage	M stage	AJCC stage
June, 2008	1	March 23, 2009	9	Male	55	0	High	III	T3	Unknown	M0	Unknown
December, 2008	0	January, 2010	13	Male	75	0	High	II	T3	N0	M0	3
November 29, 2011	1	March, 2014	28	Male	62	1	High	II-III	T3	N0	M0	3
May, 2007	1	July 6, 2009	26	Male	76	0	High	II	T2	N1	M0	4
September, 2007	1	January 31, 2008	4	Male	67	0	High	II-III	T2	N1	M0	4
September 14, 2009	1	March 9, 2010	6	Male	59	0	High	II	T3	N0	M0	3
December 4, 2009	0	November, 2012	43	Male	55	0	High	II-III	T3	N0	M0	3
March 2, 2010	1	April 21, 2011	13	Female	85	0	High	II-III	T3	Unknown	M0	Unknown
February, 2008	1	May 19, 2012	51	Male	51	1	High	III	T4a	N1	M0	4
May, 2007	0	March, 2014	82	Male	75	0	High	III	T3	N0	M0	3
May 5, 2009	1	May 3, 2010	12	Male	78	0	High	II	T3	Unknown	M0	Unknown
November 30, 2010	0	March, 2014	40	Male	78	1	Low	I-II	Tis	Unknown	M0	Unknown
December 12, 2010	1	September 27, 2011	9	Female	77	0	High	II-III	T3	N0	M0	3
January 19, 2011	0	March, 2014	38	Male	75	1	High	II	T2	N0	M0	2
May, 2007	0	November, 2012	66	Male	64	0	High	II-III	T2	Unknown	M0	Unknown
September, 2007	1	June 3, 2008	9	Male	77	1	High	II	T1	Unknown	M0	Unknown
June 18, 2009	1	January 15, 2010	7	Male	50	0	High	II-III	T3	N0	M0	3
November 18, 2010	1	March, 2014	40	Male	75	0	High	III	T2	N1	M0	4
September 10, 2010	1	September 21, 2012	24	Male	84	0	High	II-III	T3	N0	M0	3
January 26, 2010	0	November, 2012	33	Male	48	0	High	II-III	Tis	Unknown	M0	Unknown
June, 2008	1	July, 2011	37	Male	65	0	High	II	T3	N0	M0	3
August 26, 2009	0	March, 2014	55	Female	65	0	High	II-III	T2	N0	M0	2
October 27, 2009	1	March 12, 2010	5	Male	79	0	High	II-III	T4a	Unknown	M0	4
January 7, 2010	1	March 29, 2012	26	Female	79	0	High	III	Unknown	Unknown	M0	Unknown
November, 2007	1	February 15, 2008	3	Male	68	0	High	II-III	T3	Unknown	M0	Unknown
May, 2007	1	May 28, 2008	12	Female	66	1	High	III	T2	N0	M0	2
November 2, 2009	1	June 25, 2013	43	Male	75	0	High	III	T3	N0	M0	3
December, 2008	1	August 12, 2009	8	Male	77	0	High	II-III	T3	N1	M0	4
February 10, 2009	0	November, 2012	45	Male	57	0	High	II	Tis	N0	M0	Ois
December 28, 2009	1	May 7, 2010	5	Male	61	0	High	II-III	T3	N1	M0	4

November, 2007	1	April 18, 2009	17	Female	58	0	High	II-III	T3	N0	M0	3
June, 2008	1	February 20, 2010	20	Male	82	0	High	II-III	T3	N0	M0	3
December, 2008	0	March, 2014	63	Male	73	0	High	II-III	T3	Unknown	M0	Unknown
November 19, 2009	0	March, 2014	52	Male	76	0	High	II-III	T3	N0	M0	3
January 11, 2011	1	February 6, 2013	25	Male	58	0	Low	I-II	T4a	N1	M0	4
June 4, 2009	1	March 2, 2014	57	Male	74	0	High	II	T1	N0	M0	1
June 28, 2010	0	July, 2016	73	Male	75	1	High	II-III	Tis	N0	M0	Ois
November, 2008	0	March, 2014	64	Male	62	0	High	II-III	T2	N0	M0	2
December 3, 2010	0	March, 2014	39	Male	67	0	High	II-III	T2	N0	M0	2
January 27, 2010	0	March, 2014	50	Female	77	0	High	II-III	Unknown	Unknown	M0	Unknown
May, 2007	0	August 20, 2009	27	Female	72	0	High	III	T2	N0	M0	2
January, 2007	0	November, 2012	70	Male	67	1	High	II	Tis	N0	M0	Ois
December 28, 2010	0	October, 2014	46	Male	83	0	High	III	T1	Unknown	M0	Unknown
July, 2008	0	March, 2014	68	Male	54	0	High	II	T2	N0	M0	2
March, 2008	1	September 16, 2009	18	Male	73	1	High	III	T1	Unknown	M0	Unknown
July, 2008	0	March, 2014	68	Male	68	0	High	II	T2	N0	M0	2
October, 2008	0	March, 2014	65	Male	82	0	High	II	T2	N0	M0	2
March 19, 2010	0	March, 2014	48	Male	76	0	High	II-III	T1	N0	M0	1
March 24, 2010	1	May 11, 2013	38	Male	61	1	Low	I-II	T1	N0	M0	1
May, 2008	0	March, 2014	70	Male	57	0	High	III	T2	N0	M0	2
February 12, 2011	1	November 21, 2011	9	Male	71	0	High	III	T3	N0	M0	3
July 22, 2008	0	November, 2012	52	Male	75	1	High	II-III	T1	N0	M0	1
August, 2007	1	January 8, 2009	17	Male	71	0	High	II	T1	N0	M0	1
September, 2007	1	August 27, 2009	23	Male	58	1	High	II-III	T1	N0	M0	1
November, 2007	1	July 22, 2013	68	Male	61	1	High	II	T1	N0	M0	1
December 16, 2009	0	March, 2014	51	Male	57	0	High	II	T1	N0	M0	1
November, 2007	0	November, 2012	60	Female	69	0	High	II-III	T2	N0	M0	2
December 6, 2010	0	November, 2012	24	Male	44	0	High	II-III	T3	N0	M0	3
January 20, 2009	0	March, 2014	62	Male	80	0	High	II	T2	Unknown	M0	Unknown

AJCC, American Joint Committee on Cancer.

Table SIV. Information of the GEO datasets and the IMvigor210 cohort for the validation of FOXF1 expression patterns and prognostic value.

GEO ID	No. of normal tissue samples	No. of tumor samples	Survival outcome	Platform	Country	Particular year
GSE121711	8	10	-	GPL17586	Spain	2018
GSE13507	68	165	OS	GPL6102	Korea	2010
GSE188715	13	57	-	GPL28038	China	2021
GSE3167	14	33	-	GPL96	Denmark	2005
GSE37815	6	18	-	GPL6102	Korea	2013
GSE38264	10	28	-	GPL6244	Spain	2014
GSE40355	8	16	-	GPL8227	Germany	2013
GSE42089	8	10	-	GPL9828	USA	2013
GSE31684	0	93	OS	GPL570	USA	2012
GSE48075	0	142	OS	GPL6947	USA	2014
GSE169455	0	149	OS; RFS	GPL6244	Sweden	2021
IMvigor210	0	200	OS	-	-	2016

GEO, Gene Expression Omnibus; OS, overall survival; RFS, recurrence-free survival.

Table SV. Clinical features of the patients with BC in TCGA dataset.

Clinical features	Patients with BC	FOXF1-high group	FOXF1-low group	P-value
Patients, n (%)	406 (100)	203 (50)	203 (50)	
Mean age (years)	68.5	68.15±9.86	67.58±11.01	0.5985
Sex, n (%)				0.032
Female	106 (26.1)	63 (31.0)	43 (21.2)	
Male	300 (73.9)	140 (69.0)	160 (78.8)	
AJCC stage, n (%)				0.029
Stage i	3 (0.7)	1 (0.5)	2 (1.0)	
Stage ii	128 (31.5)	51 (25.1)	77 (37.9)	
Stage iii	141 (34.7)	79 (38.9)	62 (30.5)	
Stage iv	132 (32.5)	72 (35.5)	60 (29.6)	
Unknown	2 (0.5)	0 (0)	2 (1.0)	
Grade, n (%)				0.323
Low grade	20 (4.9)	7 (3.4)	13 (6.4)	
High grade	383 (94.3)	195 (96.1)	188 (92.6)	
Unknown	3 (0.7)	1 (0.5)	2 (1.0)	
Subtype, n (%)				0.552
Papillary	131 (32.3)	61 (30.0)	70 (34.5)	
Non-papillary	270 (66.5)	140 (69.0)	130 (64.0)	
Unknown	5 (1.2)	2 (1.0)	3 (1.5)	
T stage, n (%)				<0.001
T0 + T1	5 (1.23)	1 (0.5)	4 (2.0)	
T2	117 (28.8)	50 (24.6)	67 (33.0)	
T3	193 (47.5)	106 (52.2)	87 (42.9)	
T4	58 (14.3)	37 (18.2)	21 (10.3)	
Unknown	33 (8.1)	9 (4.4)	24 (11.8)	
M stage, n (%)				0.059
M0	198 (48.8)	94 (46.3)	104 (51.2)	
M1	11 (2.7)	3 (1.5)	8 (3.9)	
Unknown	197 (48.5)	106 (52.2)	91 (44.8)	
N stage, n (%)				<0.001
N0	236 (58.1)	120 (59.1)	116 (57.1)	
N1	44 (10.8)	19 (9.4)	25 (12.3)	
N2	76 (18.7)	48 (23.6)	28 (13.8)	
N3	7 (1.7)	4 (2.0)	3 (1.5)	
Unknown	43 (10.6)	12 (5.9)	31 (15.3)	
Survival status, n (%)				0.484
Alive	226 (55.7)	109 (53.7)	117 (57.6)	
Deceased	180 (44.3)	94 (46.3)	86 (42.4)	
Median survival (days)	536.0 (617.5)	546.0 (645.5)	507.0 (575.5)	0.209

BC, bladder cancer; TCGA, The Cancer Genome Atlas; AJCC, American Joint Committee on Cancer.