

## Supplemental Data

### A. Candidate urine markers screened out by perl program

Unigene	EST from NT	EST from Cancer	SAGE Tag	SAGE NT count	Reference Sequence	U133Probe	Final Select
Hs. 351118	2	20	ACGCTATGTA	1	NM_206828	237461_at	1
Hs. 515223	6	15	AAATGGACAA	3	AK092401	227919_at	1
Hs. 167176	3	10	NA	0	NM_01959		
Hs. 495569	6	8	GGAGGCCTGC	1	BQ014236		
Hs. 28700	10	7	AAGTCTGAA	1	NM_012215	200899_s_at	
Hs. 568727	0	7	AGTCCACAC	1			
Hs. 466257	10	6	TGTCTGCTGC	15	NM_025245	230536_at	1
Hs. 253320	10	5	GAGTACTTAG	1	NM_01830		
Hs. 458395	8	5	AAGTGGAAAT	3			
Hs. 153704	19	5	ACATCTTGCT	14	NM_002497	204641_at	
Hs. 55304	2	4	AGATGATTGC	1			
Hs. 199731	3	4	AATTCACCTT	1	NM_015717	220428_at	
Hs. 551629	5	4	CATCAAGTGC	1			
Hs. 520321	17	4	TCTGAAAGTC	2	NM_01859		
Hs. 567758	4	4	GTAATTAATG	2			
Hs. 362343	2	4	TTAATAGTAC	6	AK123745	239768_x_at	1
Hs. 281295	2	3	NA	0			
Hs. 2182	11	3	CTCAGATGTA	1	NM_017915	220060_s_at	1
Hs. 61995	0	3	TCTCAGAAGA	1			
Hs. 447869	18	3	AAGGCCGTCA	2			
Hs. 447969	13	3	TGTCATTGGA	2	NM_00282		
Hs. 449194	4	3	CAGATGGAGC	2	NM_003290	209344_at	
Hs. 285055	14	3	AAGATGTAA	3			
Hs. 307043	10	3	TGGTTATCTT	6	NM_152303	232214_x_at	1
Hs. 422466	3	3	CAGAGAATAA	7			
Hs. 405614	17	3	CTGTCAGCGT	11	NM_138455	225681_at	
Hs. 433586	3	3	TGAGGATACA	11	AK098294	242253_at	
Hs. 307972	11	3	TCCTCAGGAC	12	NM_15267		

### B. Primers used in this research

Primers	Position (5' end)	Sequences (5' to 3' )
Sense: U1	DQ343132: 279	GGGACTCCTTCGTGAGACC
Anti-Sense: L1	DQ343132: 859	AGAGGAACGGATGAAGCCTG
Sense: S-5	Chr19(+): 15800389	GAAGAAATGACCCAGGAGCTGAT
Sense: S-4	Chr19(+): 15800601	ATATGTCCAGGTGGCCTACAG

Sense: S-3	Chr19(+): 15800664	CAGCCAATTCCTGCCTTAACT
Sense: S-2	Chr19(+): 15800709	ACCATTATGACGTGTTCTCTGC
Sense: S-1	Chr19(+): 15800757	TGACATTCTTCTGGACAATGAGTC
Anti-sense: A1	Chr19(+): 15807203	GGCATATTAGCTTAAATGTAGGTG

### C. Full length cDNA sequence of UCA1

>DQ343132

TGACATTCTTCTGGACAATGAGTCCCATCATCTCTCCACCATGCACCTTGTGACTCCCT  
CCTCTGCTGACAACAGATAACCACCTTTAACTGTAACCTTCCACAGCCTACCCCAGCCC  
TATAAAGCTGCCCTCTCCTATCTCCCTTCGCTGACTCTCTTTTCAGACTCAGCCCCTT  
GCACCCAAGTGAATTAACAGCCTTGTGCTCACACAAAGCCTGTTTAGGTGGTCTTCTA  
TACGGACATGCTTGACACTTGGTGCCAAAATCTGGGCCAGGGGGACTCCTTCGTGAGA  
CCGGCCCCCTGTCTGGCCCTCATTCCGTGAAGAGATCCACCTGCGACCTCGGGTCCT  
CAGACCAGCCCAAGGAACATCTACCAATTTCAAATCGGATCTCCTCGGCTTAGTGGC  
TGAAGACTGATGCTGCCCGATCGCCTCAGAAGCCCCTTGGACCATCACAGATGCCGAG  
CTTCGGGTAACCTTACGGTGGAGGATTCCCAGCCATATGAAGACACCCTAGCTGGAC  
GATCAGTCCTTGTCAAAAGTCTGACCCCTCAAACCTCTACAGCCTCAATGGACCAGACC  
CTACCCGGTCATTTATAGCACACCAACTGCCGTCCATCTGCAGGACCCTCTCCATTGGG  
TTCACCATTCCAGAATAAAGCCATGCCCATCAGACAGCCAGCTTGATCTCTCCTCTTCC  
TCCTGGAAGCCACAAGATTAGGCCGAGAGCCGATCAGACAAACAACCTACAACCCTTA  
AGCTCCTGGCAGCGCCAGCCAAGGCCATGCTTCCATGCAACACTCCTTCCAAATGGC  
CATCCCAGCATGCTTCCAAGCAGGCTTCATCCGTTCTCTGGACCCTCATCTCTTAAGA  
CCTGCCGCCTATAAAAAGGATTATATCTTGAGACCCTATCCTCTAAAATTTTTTCCACAC  
CCAAAACAAAAAATCTCTGGGTCAAAGTCTAAAACGCTTAGGCTGGCAACCATCAGA  
TCCTTGCCCATGGTGTCTCAAGCCTACTCTCATGAAATGGACAACAGTACACGCATAT  
GGGGCCAGTTCACATATTTGGCAACCAGACCAGCATCCAGGACAACACAAAGTATGT  
TGTTTGTGTTAGAGGGCTTGGGACATTTCACTCTTTGCCAGCCTCAGCTTAATCCAGG  
AGACAAAGATTATTTTCTTATTATCTTCTGCATAGGATCTGCAATCAGAACTATTGA  
ACTTCTCCATTCAGACCGCCACTCACACCTATGGGAAAAGGGTAATGTATCATCGGCTT  
AGCAACAGGGAATACTATTCGTATGATGGAAAATGGGGACAAAAGGCTTTGGTACATA  
AAACATTATTCCTTCTTGGCCTAAAAACTCATCGCCACCTACATTAAAGCTAATATGCC  
AA

### C. US FDA approved cancer markers screened out by HPTAA database

US FDA approved cancer biomarkers	Hptaa
$\alpha$ -Fetoprotein	YES
HCG	YES
CEA	YES
PSA	YES
Oestrogen receptor	YES
progesterone receptor	YES
Fibrin/FDP	YES

Epidermal growth factor receptor	NO
KIT	NO
Thyroglobulin	NO
Cytokeratin	NO
HER2/NEU	NO

FDA approved cancer markers that can not be assigned to gene id are not included.

#### D. Clinicopathological data and experimental results of 94 bladder TCC patients.

Id	Age	Sex	Stage	Grade	Tissue UCA1	Urine UCA1	NMP22	Cytology
1	77	M	4	3	+++	+++	+	+
2	71	M	3	2	+++	+++	+	+
3	74	M	2	3	+++	+++	+	+
4	54	M	3	2	+++	+++	+	+
5	59	M	2	3	+++	++	+	+
6	38	M	1	3	++	+	+	+
7	75	M	3	2	++	+	-	-
8	70	M	1	1	NA	-	-	-
9	61	M	1	3	NA	+	+	+
10	36	F	1	2	NA	+	NA	NA
11	58	F	1	2	NA	-	NA	NA
12	60	M	1	3	+++	+	+	+
13	70	M	3	3	+++	+++	+	+
14	69	M	1	3	+++	+++	+	+
15	66	M	1	2	NA	+	-	+
16	68	F	1	2	NA	+	NA	NA
17	61	F	2	3	+++	+	+	+
18	70	F	1	1	NA	+	+	-
19	72	M	1	3	NA	+	-	+
20	66	M	1	2	NA	-	-	-
21	62	M	2	3	+	+	+	-
22	71	M	1	2	NA	+	-	-
23	65	M	1	2	NA	+	NA	NA
24	77	M	1	2	+	+	NA	NA
25	75	F	1	3	NA	+	-	-
26	63	F	1	1	NA	-	-	-
27	72	M	2	3	++	+	NA	NA
28	71	F	2	2	-	-	-	+
29	64	M	1	3	NA	++	-	+
30	68	F	1	3	NA	++	-	+
31	46	M	1	2	NA	+	NA	NA
32	61	F	1	2	NA	++	NA	NA
33	86	M	1	2	NA	-	-	-
34	72	M	1	2	NA	+	-	+

35	70	M	1	2	NA	+	NA	NA
36	68	M	1	2	NA	+	+	+
37	74	M	1	2	NA	++	-	-
38	66	M	1	2	NA	++	-	NA
39	74	M	1	1	NA	++	+	-
40	59	M	1	1	NA	+	+	+
41	64	M	1	2	NA	++	-	NA
42	85	M	1	2	NA	++	NA	NA
43	72	M	1	3	NA	+	-	-
44	64	M	1	2	NA	+	NA	NA
45	69	F	1	3	NA	++	+	+
46	76	M	4	3	+++	+++	+	+
47	70	M	1	2	NA	++	-	-
48	72	M	4	3	+++	+++	+	+
49	85	M	1	1	NA	+	+	+
50	58	M	1	2	NA	++	NA	NA
51	74	M	1	2	NA	++	+	NA
52	63	M	1	1	NA	-	-	+
53	91	M	1	3	NA	+++	+	+
54	45	M	1	2	NA	+	-	-
55	59	M	1	2	NA	++	-	NA
56	52	F	1	2	NA	+	+	+
57	85	F	2	2	++	+	-	-
58	78	M	2	2	NA	+++	+	+
59	69	F	1	1	NA	-	-	-
60	72	M	1	2	NA	+++	+	+
61	73	M	1	1	NA	-	-	-
62	49	F	1	1	NA	+	+	+
63	65	M	2	2	+	+	+	+
64	61	M	1	3	NA	-	+	-
65	25	M	2	2	+++	+++	-	+
66	68	M	1	1	NA	-	-	-
67	69	M	1	1	-	-	-	-
68	69	M	4	3	NA	+++	NA	+
69	68	M	1	2	NA	++	NA	NA
70	78	F	2	3	+++	+++	+	+
71	75	M	1	2	NA	+	NA	NA
72	81	M	1	1	NA	-	NA	-
73	72	F	1	1	NA	++	NA	-
74	65	M	1	2	NA	++	NA	+
75	61	F	1	2	NA	+	NA	NA
76	57	M	1	2	NA	++	NA	NA
77	70	M	2	3	+	++	NA	NA
78	79	M	1	2	NA	+	NA	NA

79	48	M	1	1	NA	-	NA	NA
80	72	M	3	3	NA	+++	+	+
81	67	M	1	2	+	+	NA	+
82	57	F	2	2	-	-	-	-
83	77	M	3	2	NA	-	+	+
84	75	F	2	2	NA	++	+	+
85	80	M	2	3	NA	+++	+	+
86	83	M	3	3	NA	+++	-	+
87	85	M	2	2	NA	-	+	-
88	51	M	4	3	NA	+++	NA	+
89	89	M	3	3	NA	+++	NA	+
90	62	F	2	3	NA	++	NA	NA
91	72	F	3	2	NA	++	-	+
92	65	F	3	2	NA	-	-	-
93	68	F	2	3	NA	+++	NA	NA
94	71	F	3	3	NA	+++	NA	NA

#### E. Clinicopathologic data and UCA1 expression in 46 bladder TCC tissues

ID	Age	Gender	Stage	Grade	Multiplicity	Max Size (cm)	Tissue UCA1
1	77	M	4	3	1	2.5	+++
2	71	M	3	2	1	3.5	+++
3	74	M	2	3	1	0.9	+++
4	54	M	3	2	1	7	+++
5	59	M	2	3	1	1.8	+++
6	38	M	1	3	1	1.8	++
7	75	M	3	2	0	3.8	++
12	60	M	1	3	0	NA	+++
13	70	M	3	3	1	5.5	+++
14	69	M	1	3	0	1	+++
17	61	F	2	3	1	4.8	+++
21	62	M	2	3	0	NA	+
24	77	M	1	2	0	3.5	+
27	72	M	2	3	1	11	++
28	71	F	2	2	0	NA	-
46	76	M	4	3	1	6	+++
48	72	M	4	3	0	3	+++
57	85	F	2	2	1	3.5	++
63	65	M	2	2	1	7	+
65	25	M	2	2	1	1.5	+++
67	69	M	1	1	0	NA	-
70	78	F	2	3	1	2.8	+++
77	70	M	2	3	1	3.1	+
81	67	M	1	2	0	NA	+

82	57	f	2	2	0	NA	-
B1	75	M	1	2	1	NA	+++
B2	53	M	2	3	0	2.5	+++
B3	75	M	4	3	1	NA	-
B4	28	M	4	3	1	4	+++
B5	49	M	2	2	1	2	+++
B6	75	M	4	3	1	3.5	++
B7	35	F	3	3	0	3.5	++
B8	62	M	2	3	1	NA	-
DU02	48	M	4	2	1	5.5	+++
DU06	61	F	3	3	1	6.5	-
DU15	69	M	3	3	0	4	+++
DU16	27	F	1	3	0	3	+
DU18	81	M	4	3	1	2	+
DU34			3	3	1	6.5	+++
DU44	46	M	3	3	1	3.5	+++
z1	70	m	1	2	0	NA	+
z2	73	m	1	2	0	NA	-
z3	61	m	3	3	1	4.5	++
z4	65	m	2	3	1	3	++
z5	77	m	4	3	1	2	+++
z6	69	f	1	3	0	6	+

#### F. Detailed information of 18 bladder tumor markers that have been analyzed.

GeneSym	U133 Probe	GeneID	Gene Name	PMID*
BIRC5	202095_s_at	332	Survivin	14713774
CALR	200935_at	811	calreticulin	14764641
CFH	213800_at	3075	factor H	15774575
CFHL1	206910_x_at	3078	complement factor H-related protein 1	15774575
DLG7	203764_at	9787	HURP	12100959
ELK1	203617_x_at	2002	BLCA-4	16360453
HYAL1	210619_s_at	3373	Hyaluronoglucosaminidase 1	9044860
HYAL2	206855_s_at	8692	Hyaluronoglucosaminidase 2	9044860
HYAL3	211728_s_at	8372	N-acetyltransferase 6	9044860
HYAL4	220249_at	23553	Hyaluronoglucosaminidase 4	9044860
KRT20	213953_at	54474	Keratin 20	9817302
MMP9	203936_s_at	4318	Matrix metalloproteinase-9	9865914
MUC7	216359_at	4589	Mucin 7	12837463
PLAU	205479_s_at	5328	Urokinase Plasminogen Activator (uPA)	12736046
PLAUR	211924_s_at	5329	uPA receptor (uPAR),	12736046
PSCA	205319_at	8000	Prostate stem cell antigen	12771726
TERT	207199_at	7015	Telomerase	12893365
UCA1	227919_at		Urothelial Carcinoma associated 1	-

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\*Note: PMID: Pubmed ID of related literatures.