

**Supplemental Table 1.** Characteristics for all men and by ERG-overexpression status among 90 men diagnosed with prostate cancer during transurethral resection of the prostate (TURP)<sup>a</sup>, PHS and HPFS cohorts 1982-2011

<b>Characteristic</b>	<b>All Men</b>	<b>ERG Negative</b>	<b>ERG Positive</b>	<b>% ERG Positive</b>	<b>P<sup>b</sup></b>
Number	90	66	24	27%	
Mean Follow-Up Time (years ± SD)	10.2 ±6.5	10.3 ±6.1	9.9 ±7.6	-	0.80
Mean Age at Diagnosis (years ± SD)	72.3 ±6.3	72.8 ±6.0	71.1 ±7.0	-	0.27
<i>Clinical Tumor Stage</i>					
T1/T2	63 (71%)	53 (80%)	10 (43%)	16%	
T3	8 (9%)	3 (5%)	5 (22%)	63%	
T4/N1/M1	18 (20%)	10 (15%)	8 (35%)	44%	<0.01
<i>Gleason Sum</i>					
2-6	22 (24%)	19 (29%)	3 (13%)	14%	
3+4	22 (24%)	17 (26%)	5 (21%)	23%	
4+3	15 (17%)	8 (12%)	7 (29%)	47%	
8-10	31 (34%)	22 (33%)	9 (38%)	29%	0.17
<i>PSA-Level at Diagnosis</i>					
<4	9 (25%)	8 (26%)	1 (20%)	11%	
4-<10	13 (36%)	13 (42%)	0 (0%)	0%	
≥10	14 (39%)	10 (32%)	4 (80%)	29%	0.10
<i>Lethal Prostate Cancer<sup>c</sup></i>					
No	57 (63%)	46 (70%)	11 (46%)	19%	
Yes	33 (37%)	20 (30%)	13 (54%)	39%	0.05
<i>All Cause Mortality<sup>d</sup></i>					
No	22 (24%)	21 (32%)	1 (4%)	5%	
Yes	68 (76%)	45 (68%)	23 (96%)	34%	0.01

Abbreviations: PSA – Prostate Specific Antigen; SD – Standard Deviation

<sup>a</sup> Numbers may not add up to 90 because men with missing information for a characteristic are not included in that characteristic

<sup>b</sup> P-values are based on t-test for follow-up time and age at diagnosis; Fisher's Exact test for tumor stage, Gleason sum, PSA-level at diagnosis, lethal prostate cancer, and all cause mortality

<sup>c</sup> Lethal prostate cancer includes metastases to distant organs or bone, and prostate cancer death

<sup>d</sup> All cause mortality includes prostate cancer death and death due to any other cause

**Supplemental Table 2.** Characteristics of studies included in the meta-analysis on *TMPRSS2:ERG* and prostate cancer outcomes

Cohort (Year)	Country	Mean Age, years	Cohort Type	Sample Size	Primary Assay for Fusion	Tissue Assayed for Fusion	Positive vs. Negative Outcome Measures	Mechanism vs. Negative Outcome Measures
PHS / HPFS (RP)	United States	65.4	RP	1,180	IHC	RP	Mortality <sup>a</sup> ; Recurrence <sup>b</sup> ; Stage; Gleason; Age	N/A
PHS / HPFS (TURP)	United States	72.3	TURP	90	IHC	TURP	Mortality <sup>a</sup> ; Stage; Gleason; Age	N/A
Albadine (2009) (53)	United States	Unknown	RP; Non-Minute	63	FISH	RP	Stage	Stage
Attard, Clark (2008) (10)	United Kingdom	70 <sup>c</sup>	WW; TURP	445	FISH	TURP	Stage; Gleason; Age	Gleason; Age
Barros-Silva (All) (2011) (63)	Portugal	72.0	Biopsy	200	FISH	Biopsy	Stage; Gleason; Age	Mortality; Gleason; Age
Barros-Silva (HT) (2011) (63)	Portugal	74.3	Biopsy; HT	125	FISH	Biopsy	Mortality	N/A
Barros-Silva (RT) (2011) (63)	Portugal	68.5	Biopsy; RT	46	FISH	Biopsy	Mortality	N/A
Barros-Silva (RP) (2011) (63)	Portugal	65.5	Biopsy; RP	18	FISH	Biopsy	Mortality	N/A
Barros-Silva (Other) (2011) (63)	Portugal	69.1	Biopsy; Other Treatment	9	FISH	Biopsy	Mortality	N/A
Bonaccorsi (2009) (54)	Italy	64.4	RP ± prior HT	84	RT-PCR	RP	Recurrence; Stage; Gleason	N/A
Boormans (2010) (64)	Netherlands <sup>d</sup>	62.7	Pelvic Lymph Node Positive; HT + RP	71	RT-PCR	LN	Mortality; Recurrence <sup>e</sup> ; Stage; Gleason <sup>f</sup> ; Age	N/A
Braun (RP) <sup>gh</sup> (2011) (71)	Germany	66	RP	119	FISH	RP	Gleason	N/A
Braun (TURP) <sup>h</sup> (2011) (71)	Germany	72	TURP	105	FISH	TURP	Gleason	N/A
Darnel (2009) (25)	Canada	64	RP	163	FISH	RP	Stage	Stage
Demichelis, Fall (2007) (11)	Sweden	73.8	WW; TURP	111	FISH	TURP	Mortality <sup>a</sup> ; Gleason	N/A
Esgueva, Perner <sup>i</sup> (2010) (73)	Germany	62 <sup>c</sup>	RP ± prior HT	540	FISH	RP	Stage; Gleason	Stage; Gleason
Falzarano (2010) (55)	United States	59 <sup>c</sup>	RP; TZ Focus	59	FISH	RP	Stage; Gleason	Stage; Gleason
Falzarano (2011) (56)	United States	59 <sup>c</sup>	RP; Single Focus	59	FISH	RP	Stage; Gleason	Stage; Gleason
Fitzgerald (2008) (57)	United States	59.7	RP (+ minimal TURP)	214	FISH	RP; TURP	Mortality; Age	N/A
Furusato, Gao (2008) (58)	United States	58.0	RP; Fusion Type A; Multi-Focal	45	RT-PCR	RP	Recurrence; Stage; Gleason; Age	N/A
Furusato, Tan, Young (2010) (65)	United States	Unknown	RP; Multi-Focal	132	IHC	RP	Recurrence	N/A
Furusato (2011) (66)	Japan	69 <sup>c</sup>	Biopsy; RP	209	IHC	Biopsy; RP	Stage; Gleason	N/A
Gopalan (Full Cohort) (2009) (15)	United States	60.7	RP + PLND	521	FISH	RP	Mortality; Recurrence; Stage; Gleason	Mortality; Recurrence; Stage; Gleason
Gopalan (Test Cohort) (2009) (15)	United States	Unknown	RP	67	FISH	RP	Mortality; Recurrence; Gleason	Mortality; Recurrence; Gleason
Guo (2009) (59)	United States	59	RP; PZ Focus (w/ TZ Focus Present)	30	FISH	RP	Recurrence; Stage	Recurrence; Stage
Hermans, Boormans (RP) (2009) (27)	Netherlands <sup>d</sup>	62.5	RP; Primary Tumors; Fusion exon0	67	RT-PCR	RP	Mortality; Recurrence; Stage <sup>l</sup> ; Gleason; Age	N/A
Hermans, Boormans (TURP) (2009) (27)	Netherlands <sup>d</sup>	69.3	TURP; Recurrent Tumors	45	RT-PCR	TURP	Mortality; Gleason; Age	N/A
Hofer, Kuefer, Maier, Rubin, Hoegel (2009) (18)	Germany	62.5	RP; Familial Cancers	75	FISH	RP	Gleason	N/A
Hoogland (2012) (72)	Netherlands	64.8	RP	437	IHC	RP	Stage; Gleason	N/A
Lapointe, Kim (2007) (16)	United States	58.9	RP	54	RT-PCR	RP	Recurrence; Stage; Gleason; Age	N/A
Laxman, Tomlins (RP) (2006) (60)	United States	56.6	Urine post DRE + RP	8	RT-PCR	Urine	Age	N/A
Laxman, Tomlins (Biopsy) (2006) (60)	United States	62.4	Urine post DRE + Biopsy	11	RT-PCR	Urine	Gleason; Age	N/A
Lee (2010) (19)	Korea	65.5	RP	254	FISH	RP	Recurrence; Stage; Gleason	N/A
Leinonen (2010) (20)	Finland	73.5	HT	178	FISH	Biopsy	Mortality; Recurrence <sup>bc</sup> ; Stage; Gleason; Age	Mortality; Recurrence <sup>bc</sup> ; Gleason
Magi-Galluzzi (All) (2010) (33)	Japan; United States	62.3	RP	150	FISH	RP	Gleason; Age	N/A
Magi-Galluzzi (Af-Am) (2010) (33)	United States	59	RP; African-American	64	FISH	RP	Stage	N/A
Magi-Galluzzi (Cauc) (2010) (33)	United States	61.5	RP; Caucasian	42	FISH	RP	Stage	N/A
Magi-Galluzzi (Japanese) (2010) (33)	Japan	67.9	RP; Japanese	44	FISH	RP	Stage	N/A
Mani 2011 (67)	United States	60.2	RP	67	RT-PCR	RP	Gleason; Age	N/A

Mao, Yu (China) (2010) (28)	China	71.5	RP	93	FISH	RP	Gleason; Age	Gleason; Age
Mao, Yu (UK) (2010) (28)	United Kingdom	63.4	RP	155	FISH	RP	Gleason; Age	Gleason; Age
Mehra (2007) (61)	United States	Unknown	RP +/- PLND	43	FISH	RP	N/A (due to data overlap)	Stage; Gleason
Mehra (2007) <sup>f</sup> (62)	United States	61	RP; Index Tumor Only	65	FISH	RP	Recurrence; Stage	N/A
Minner, Enodien (2011) (26)	Germany	62	RP	2,805	IHC	RP	Recurrence; Stage; Gleason; Age	N/A
Miyagi (2010) (29)	Japan	Unknown	RP	194	RT-PCR	RP	Stage	N/A
Mosquera (2009) (30)	United States	64 <sup>c</sup>	PSA Screened Biopsy	100	FISH	Biopsy	Gleason	Gleason
Nam (2007) (12)	Canada	61.8	RP	165	RT-PCR	RP	Recurrence; Stage <sup>j</sup> ; Gleason	N/A
Paulo, Barros-Silva (2012) (73)	Portugal	Unknown	RP	184	TLDA <sup>m</sup>	RP	Stage	N/A
Perner, Demichelis, Beroukhir (2006) (6)	Germany; United States	Unknown	RP	118	FISH	RP	Stage	Stage
Rostad (2009) (17)	Germany; Norway	62.8	Urine + DRE Pre-Treatment	55	RT-PCR	Urine	Stage; Gleason	N/A
Rouzier (2008) (21)	France	63.6	RP ± Adjuvant Therapy	51	RT-PCR	RP	Recurrence; Stage; Gleason; Age	N/A
Rubio-Briones, Fernández-Serra (2010) (22)	Spain	66 <sup>c</sup>	RP	226	RT-PCR	RP	Recurrence; Stage; Gleason	N/A
Saramaki (2008) (23)	Finland	62.9	RP	150	FISH	RP	Recurrence; Stage; Gleason; Age	N/A
Sun, Li (RP) (2010) (31)	China	69.6	RP	43	FISH	RP	Stage; Gleason; Age	N/A
Sun, Li (TURP) (2010) (31)	China	77.3	TURP	7	FISH	TURP	Stage; Gleason	N/A
Svensson (2011) <sup>k</sup> (68)	United States	63.2	RP	86	FISH	RP	Stage; Gleason <sup>n</sup>	Stage; Gleason <sup>n</sup>
Tu, Rohan (2007) (32)	United States	Unknown	RP	82	RT-PCR	RP	Stage; Gleason	N/A
Vainio (2011) (69)	Finland	62.5	RP	33	RT-PCR	RP	Recurrence; Stage; Gleason; Age	N/A
van Leenders (2011) (39)	Netherlands	68.2	Biopsy	83	IHC	Biopsy	Gleason	N/A
Wang (2006) <sup>o</sup> (13)	United States	60.6	RP	59	RT-PCR	RP	Recurrence; Stage; Gleason; Age	N/A
Winnes (2007) (70)	Sweden	76 <sup>c</sup>	Biopsy	50	RT-PCR	Biopsy	Stage; Gleason	N/A
Yoshimoto (2008) (14)	Brazil	Unknown	RP	122	FISH	RP	Recurrence; Stage; Gleason	N/A

Abbreviations: DRE – Digital Rectal Exam; FISH – Fluorescence In Situ Hybridization; HPFS – Health Professionals Follow-up Study; HT – Hormone Therapy; IHC – Immunohistochemistry; LN – Lymph Node; PHS – Physicians’ Health Study; PLND – Pelvic Lymph Node Dissection; PSA – Prostate Specific Antigen; PZ – Peripheral Zone; RP – Radical Prostatectomy; RT – Radiation Therapy; RT-PCR – Reverse Transcription Polymerase Chain Reaction; TLDA – TaqMan Low-Density Array; TURP – Transurethral Resection of the Prostate; TZ – Transition Zone; UK – United Kingdom; WW – Watchful Waiting

<sup>a</sup> Includes patients with distant metastases

<sup>b</sup> Includes metastases to lymph nodes

<sup>c</sup> Median rather than mean age

<sup>d</sup> Country of cohort not explicitly stated; corresponding author from country noted

<sup>e</sup> Recurrence while on hormone therapy

<sup>f</sup> Gleason determined from lymph node samples

<sup>g</sup> Excludes bladder cancer patients diagnosed with prostate cancer incidentally by cystoprostatectomy

<sup>h</sup> Cancers considered ERG-positive if ERG rearrangement detected in at least one tumor focus in either the transition or peripheral zone

<sup>i</sup> Assesses ERG rearrangement with *TMPRSS2*, *SLC45A3*, or *NRG1*

<sup>j</sup> ‘Organ-confined’ grouped with T2 or less; ‘Extra-prostatic’ grouped with T3 or greater

<sup>k</sup> Data available for both ERG status and *TMPRSS2* status; data for ERG status used for analysis

<sup>l</sup> ‘Organ-confined’ grouped with T2 or less; ‘Extracapsular extension’ and ‘Seminal vesicle involvement’ grouped with T3 or greater

<sup>m</sup> TLDA used in combination with RT-PCR and FISH to determine prostate cancers with an ERG fusion gene

<sup>n</sup> Outcome data taken from tumor core with highest Gleason sum

<sup>o</sup> Looking at all fusion variants

**Supplemental Table 4.** Association between *TMPRSS2:ERG* fusion mechanism and prostate cancer outcomes, results from meta-analysis

<b>Outcome</b>	<b>Number of Patients</b>	<b>Risk Ratio</b>	<b>95% CI</b>	<b>P</b>
<i>Stage pT3 at Diagnosis (10 Cohorts)<sup>a</sup></i>				
Negative	889	1.00	(ref)	(ref)
Positive-by-Deletion	457	0.96	(0.88, 1.04)	0.35
Positive-by-Translocation	261	1.05	(0.94, 1.18)	0.40
<i>Gleason &gt;7 at Diagnosis (13 Cohorts)</i>				
Negative	863	1.00	(ref)	(ref)
Positive-by-Deletion	321	0.94	(0.67, 1.32)	0.71
Positive-by-Translocation	167	1.13	(0.84, 1.52)	0.43
<i>Biochemical Recurrence (4 Cohorts)</i>				
Negative	474	1.00	(ref)	(ref)
Positive-by-Deletion	191	0.98	(0.75, 1.28)	0.89
Positive-by-Translocation	68	1.03	(0.68, 1.57)	0.87
<i>Lethal Prostate Cancer (4 Cohorts)</i>				
Negative	570	1.00	(ref)	(ref)
Positive-by-Deletion	223	0.95	(0.61, 1.49)	0.83
Positive-by-Translocation	110	1.38	(0.77, 2.48)	0.28
<b>Outcome</b>	<b>Number of Patients</b>	<b>Weighted Mean Difference</b>	<b>95% CI</b>	<b>P</b>
<i>Mean Age at Diagnosis (4 Cohorts)</i>				
Negative	607	0.00	(ref)	(ref)
Positive-by-Deletion	180	-1.94	(-4.23, 0.34)	0.10
Positive-by-Translocation	100	-0.68	(-2.35, 1.00)	0.43

<sup>a</sup> Restricted to radical prostatectomy cohorts

**Supplemental Table 5.** Association between *TMPRSS2:ERG* fusion and prostate cancer outcomes broken out by assay used to assess fusion status (radical prostatectomy specimens only), results from the meta-analysis

<b>Outcome</b>	<b>RR Stage ≥ pT3 (95% CI) # Cohorts</b>	<b>RR Gleason &gt; 7 (95% CI) # Cohorts</b>	<b>RR Recurrence (95% CI) # Cohorts</b>	<b>RR Mortality (95% CI) # Cohorts</b>	<b>WMD Age (95% CI) # Cohorts</b>
<i>Assay</i>					
FISH	1.15 (1.04, 1.27) 17	0.80 (0.67, 0.95) 15	0.98 (0.78, 1.22) 7	1.91 (0.97, 3.78) 3	-0.55 (-2.12, 1.01) 6
RT-PCR	1.19 (1.06, 1.33) 12	0.94 (0.65, 1.37) 11	1.18 (0.76, 1.84) 9	0.20 (0.06, 0.67) 1	-0.72 (-2.11, 0.68) 7
IHC	1.29 (1.19, 1.40) 4	0.82 (0.51, 1.32) 4	0.99 (0.88, 1.11) 3	1.00 (0.66, 1.50) 1 <sup>a</sup>	-0.93 (-1.73, -0.13) 2
<i>P for Effect Modification by Assay</i>					
	0.09	0.62	0.95	0.58	0.47

Abbreviations: FISH – Fluorescence In Situ Hybridization; IHC – Immunohistochemistry; RR – Risk Ratio; RT-PCR – Reverse Transcription Polymerase Chain Reaction; WMD – Weighted Mean Difference

<sup>a</sup> Only includes data from PHS / HPFS