

**Supplemental Table S1.** Clinical characteristics and CTC data for metastatic prostate cancer patients treated with hormonal therapy and analyzed for AR signaling in CTCs

Patient	Gleason score	Disease status	Sites of metastases	Treatment	Serum PSA pre-treatment (ng/mL)	Serum PSA nadir (ng/mL)	CTC/mL pre-treatment	Baseline “%AR-mix” CTCs	“%AR-on” CTC response	Prior treatment(s)
Prost1	6	CSPC	bone, LN	leuprolide	2.30	0.12	7.1	<10%	down	none
Prost2	7	CSPC	bone	leuprolide	2.49	<0.1	11.6	<10%	down	none
Prost3	10	CSPC	LN, bladder	leuprolide	3.34	0.12	33.6	<10%	down	none
Prost4	9	CSPC	LN	leuprolide	0.41	<0.1	4.5	<10%	down	none
Prost5	6	CSPC	bone, lung	leuprolide	2.01	0.33	0*	N/A	stable	none
Prost6	9	CRPC	bone	keto	2.17	1.39	6.8	40%	stable	leuprolide
Prost7	8	CRPC	pelvic soft tissue	bic	20.50	7.74	4.3	<10%	stable	leuprolide
Prost8	6	CRPC	bone	bic	46.90	46.9	1.5*	N/A	stable	leuprolide, bic
Prost9	10	CRPC	bone	abiraterone	1063.00	919.9	9.6	41%	stable	dctx
Prost10	9	CRPC	bone, bladder	abiraterone	35.02	35.02	1.7*	N/A	up	dctx
Prost11	9	CRPC	bone, LN, liver	abiraterone	17.54	17.54	8.4	37%	up	dctx
Prost12	7	CRPC	bone, LN	abiraterone	29.34	5.81	1.2*	N/A	stable	leuprolide
Prost13	7	CRPC	bone, LN	abiraterone	425.50	177.8	7.6	63%	down	bic, dctx, cbz
Prost14	8	CRPC	bone	abiraterone	1624.00	562.7	57.5	64%	down	bic, keto, dctx, mito, Sm
Prost15	7	CRPC	bone, LN	abiraterone	359.10	175.3	6.7	18%	down	bic, keto, cabo
Prost16	6	CRPC	LN, bladder	abiraterone	1409.00	254	10.1	11%	down	bic, keto, dctx
Prost17	6	CRPC	bone, LN	abiraterone	324.60	33.81	0*	N/A	stable	keto, dctx, mito, cbz
Prost18	9	CRPC	bone, LN	abiraterone	10.68	0.26	13.7	<10%	stable	leuprolide
Prost19	9	CRPC	bladder	abiraterone	11.08	0.98	4.9	<10%	stable	leuprolide
Prost20	6	CRPC	bone, LN	abiraterone	183.00	1.75	65.2	<10%	stable	docetaxel
Prost21	8	CRPC	bone, LN	abiraterone	16.72	5.82	<1*	N/A	stable	goserelin
Prost22	N/A	CRPC	bone, LN	abiraterone	10.08	9.29	<1*	N/A	stable	leuprolide, bic
Prost23	9	CRPC	bone	abiraterone	516.60	262.5	24.3	<10%	stable	leuprolide, dctx
Prost24	8	CRPC	bone, liver, lung	abiraterone	236.30	7.49	164.8	<10%	stable	leuprolide, bic
Prost25	9	CRPC	bone, LN	abiraterone	410.00	11.08	6.0	<10%	stable	leuprolide, dctx, cabo

Key: \* = below the healthy donor threshold cut-off value of 4 CTC/mL; CRPC = castration-resistant prostate cancer; CSPC = castration-sensitive prostate cancer; LN = lymph nodes; bic = bicalutamide; dctx = docetaxel; cbz = cabazitaxel; cabo = cabozantinib; keto = ketoconazole; mito = mitoxantrone; Sm = samarium

**Supplemental Table S2** Time course data for metastatic prostate cancer patients treated with hormonal therapy and analyzed for AR signaling in CTCs

Patient	Status	Treatment	Time point	Serum PSA (ng/mL)	Total CTC/mL	PSA+/PSMA- CTC/mL	PSA+/PSMA+ CTC/mL	PSA-/PSMA+ CTC/mL	%PSA+/PSMA- CTCs	%PSA+/PSMA+ CTCs	%PSA-/PSMA+ CTCs
Prost1	CSPC	leuprolide	0	2.4	7.1	7.1	0	0	100%	†	†
			1	0.15	<1	<1	0	0	*	*	*
			2	0.12	1.1	1.1	0	0	*	*	*
Prost2	CSPC	leuprolide	0	2.49	11.6	11.6	0	0	100%	†	†
			1	0.2	8.5	1.5	<1	6.7	18%	†	79%
			2	0	3.1	3.1	0	0	*	*	*
Prost3	CSPC	leuprolide	0	3.34	33.6	32.9	<1	<1	98%	†	†
			1	0.31	19.2	4.2	<1	14.7	22%	†	77%
Prost4	CSPC	leuprolide	0	0.41	4.5	3.4	0	1.1	75%	†	25%
			1	<0.1	0	0	0	0	*	*	*
			2	<0.1	1.1	0	0	1.1	*	*	*
Prost5	CSPC	leuprolide	0	2.01	0	0	0	0	*	*	*
			1	1.59	<1	<1	0	0	*	*	*
			2	1.13	0	0	0	0	*	*	*
Prost6	CRPC	ketoconazole	0	2.17	6.8	4.1	2.7	0	60%	40%	†
			1	1.5	4.5	2.1	0	2.4	47%	†	53%
			2	1.39	<1	<1	0	0	*	*	*
Prost7	CRPC	bicalutamide	0	20.5	4.3	4.3	0	0	100%	†	†
			1	7.74	9.6	7.1	0	2.5	74%	†	26%
Prost8	CRPC	bicalutamide	0	46.9	1.5	<1	<1	<1	*	*	*
			1	84.69	3.9	<1	1.5	1.5	*	*	*
Prost9	CRPC	abiraterone	0	1063	9.6	5.7	3.9	0	59%	41%	†
			1	1007	6.3	3.1	1.0	2.1	50%	17%	33%
			2	1438	4.3	4.0	<1	0	92%	†	†
Prost10	CRPC	abiraterone	0	35.02	1.7	0	1.7	0	*	*	*
			1	41.9	68.4	5.1	20.2	43.1	8%	29%	63%
			2	90.8	76.3	6.7	37.6	32.0	9%	49%	42%
Prost11	CRPC	abiraterone	0	17.54	8.4	<1	3.1	4.4	†	37%	52%
			1	66.37	14.9	7.2	6.8	<1	48%	45%	†
Prost12	CRPC	abiraterone	0	29.34	1.2	0	0	1.2	*	*	*
			1	20.29	3.2	0	<1	2.5	*	*	*
Prost13	CRPC	abiraterone	0	425.5	7.6	<1	4.7	2.2	†	63%	29%
			1	N/A	<1	<1	0	<1	*	*	*
			2	177.8	1.9	0	<1	1.5	*	*	*
Prost14	CRPC	abiraterone	0	1624	57.5	11.3	36.9	9.4	20%	64%	16%
			1	776.40	19.5	<1	13.1	5.5	†	67%	28%
			2	690.90	22.4	7.8	12.4	2.2	35%	56%	10%
Prost15	CRPC	abiraterone	0	359.1	6.7	<1	1.2	5.1	†	18%	76%
			1	316.5	1.3	0	<1	<1	*	*	*
Prost16	CRPC	abiraterone	0	1409	10.1	3.7	1.1	5.3	37%	11%	53%
			1	647.5	<1	0	0	<1	*	*	*
			2	330.6	3.3	0	0	3.3	*	*	*
Prost17	CRPC	abiraterone	0	324.6	0	0	0	0	*	*	*
			1	105.9	0	0	0	0	*	*	*
			2	61.7	1.5	1.5	0	0	*	*	*
Prost18	CRPC	abiraterone	0	10.68	13.7	0	0	13.7	†	†	100%
			1	1.74	2.6	0	0	2.6	*	*	*
Prost19	CRPC	abiraterone	0	11.08	4.9	0	0	4.9	†	†	100%
			1	2.12	5.6	<1	0	5.3	†	†	94%
Prost20	CRPC	abiraterone	0	183	65.2	0	1.5	63.7	†	2%	98%
			1	4.22	3.7	<1	0	3.2	*	*	*
Prost21	CRPC	abiraterone	0	16.72	<1	0	0	<1	*	*	*
			1	14.27	2.1	0	0	2.1	*	*	*
Prost22	CRPC	abiraterone	0	10.08	<1	<1	0	0	*	*	*
			1	12.72	1.1	0	0	1.1	*	*	*
			2	12.48	<1	<1	0	0	*	*	*
Prost23	CRPC	abiraterone	0	367.3	24.3	22.3	1.2	<1	92%	5%	†
			1	262.5	7.5	5.4	1.8	<1	72%	24%	†
			2	325	51.7	5.3	4.2	42.2	10%	8%	82%
Prost24	CRPC	abiraterone	0	236.3	164.8	0	<1	164.1	†	†	100%
			1	29.2	89.1	1.1	0	88.0	1%	†	99%
Prost25	CRPC	abiraterone	0	410	6.0	0	0	6.0	†	†	100%
			1	159.1	4.6	0	0	4.6	†	†	100%

**KEY:** CSPC = castration-sensitive prostate cancer; CRPC = castration-resistant prostate cancer  
 Time point 0 = pre-treatment; Time point 1 = 2-5 weeks; Time point 2 = 8-14 weeks  
 \* The percentage was not calculated because the total CTC/mL count was below the threshold of 4 CTC/mL  
 † The percentage was not calculated because the fractional CTC count was <1 CTC/mL