

Supplementary Materials

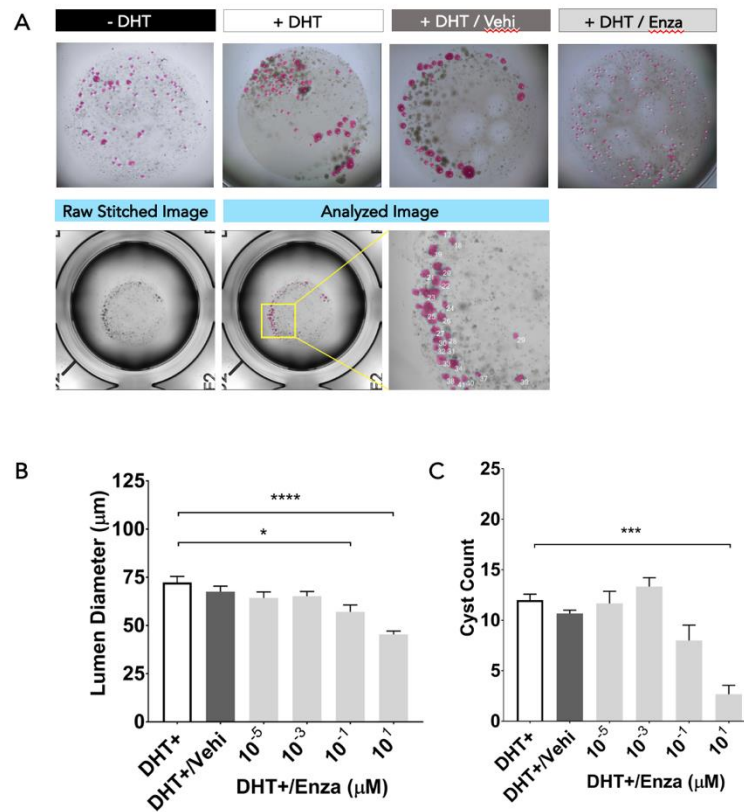


Figure S1. Digital microscope image of whole matrigel dome with spheroids outlined for area analysis. (A) Representative images of whole Matrigel domes of 3D organoid cultures with spheroids outlined in pink from the four treatment groups: -DHT, +DHT, +DHT/Vehicle, +DHT/Enzalutamide. Spheroid area was measured using the Keyence Hybrid Cell Counter at 4X magnification by outlining spheroid clusters (pink line) that were at least 50 μm in size with the Free Draw Tool. PCSD1 Organoid cultures were treated with increasing concentrations of enzalutamide to determine the effect on (B) lumen diameter (in μm) and (C) cyst count. Enzalutamide at 10 μM showed significant reduction of cyst size and number and was used in subsequent experiments. Data represent the mean from two ($n=2$) experiments \pm SEM. A student's t-test was used to determine statistical significance (** indicates $P < 0.01$). GFP fluorescence was measured using the Keyence BZX 710 microscope (Keyence Corporation) on a weekly basis.

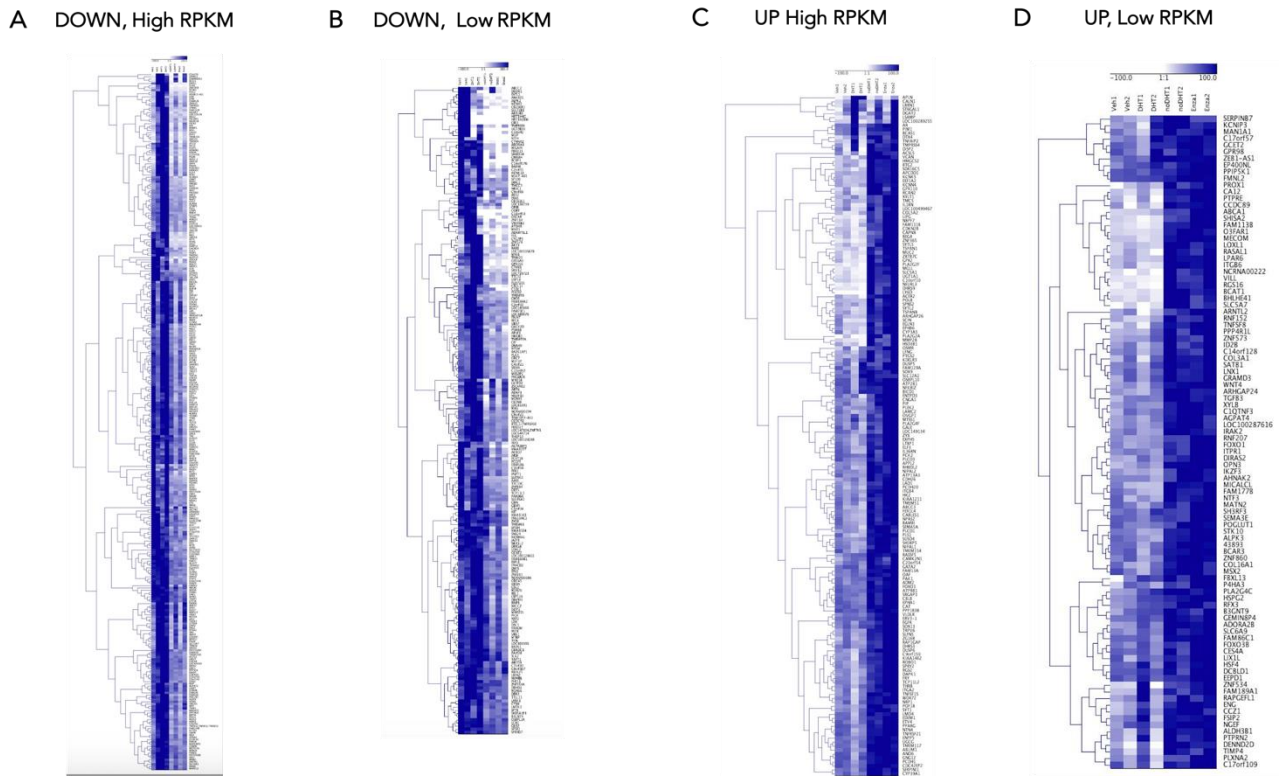


Figure S2. Hierarchical Clustering Analysis of Gene Expression Profiles from PDX Organoids under APDT. Heatmaps organized by hierarchical clustering analysis for differentially expressed genes in PCSD1 organoids under two androgen treatment conditions (1) Veh (+DHT/Vehicle – 1 nM/0.1% DMSO), (2) DHT (+DHT – 1 nM) and PCSD1 organoids under two androgen deprivation treatment conditions: (3) noDHT (-DHT) and (4) Enza (+DHT/Enzalutamide – 1 nM/1uM). Genes presented in four groups: (A) down-regulated under APDT, high normalized read counts (RPKM), (B) down-regulated under APDT, low RPKM, (C) up-regulated under APDT, high RPKM, and (D) up-regulated under APDT, low RPKM. To identify genes responsive to androgen deprivation, a series of queries were applied to the read count tables. First, queries identified genes with expression change in the same direction in both experiments 1 and 2 under Enzalutamide treatment (Enza) compared to vehicle treatment (+DHT/Veh). To focus on highly responsive genes, a minimal threshold change of $\text{abs}(\log_2(\text{Enza}/\text{Veh})) > 0.75$ was required for a gene change to be considered "UP"- or "DOWN"-regulated by androgen deprivation or anti-androgen. Genes with changes below this threshold were set aside. Next, genes were ranked according to change between treatment with Enzalutamide versus noDHT, with lower values for $\text{abs}(\log_2(\text{Enza}/\text{noDHT}))$ ratios ranked higher. Filtered genes were then split into two groups for further evaluation and ranking: genes with all RPKM read counts below 10 were considered as low expression genes (Low), and the rest as higher expression genes (High), resulting in four groups of genes for pathway analysis: UP, Low RPKM (98 genes); DOWN, Low RPKM (206 genes); UP, High RPKM (171 genes); DOWN, High RPKM (312 genes).

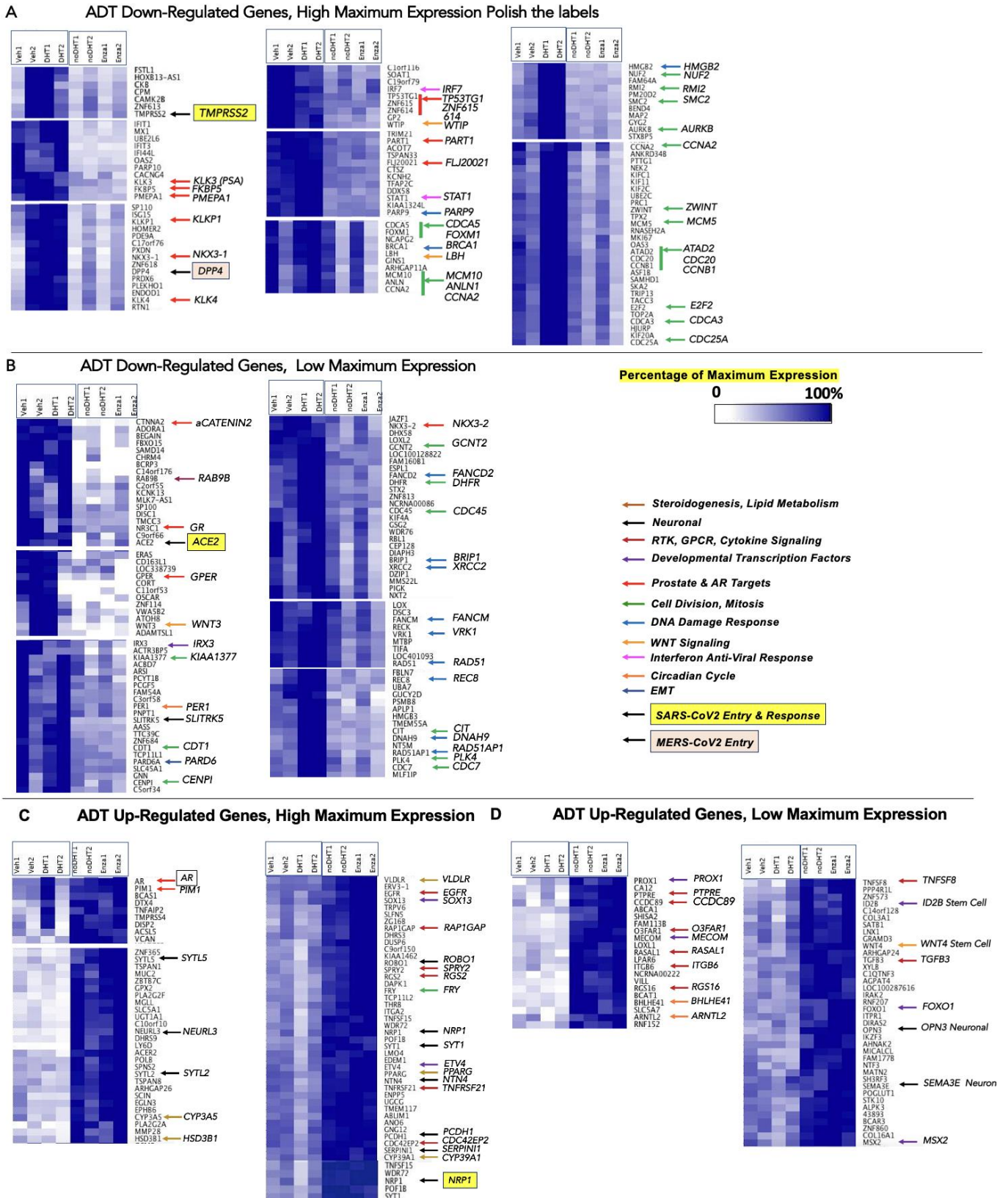


Figure S3. Comparative Gene Expression Profiling of APDT Treatment in PDOs. Hierarchical clusters were selected which show consistent gene expression changes between different androgen signaling conditions from whole genome bulk RNASeq analysis. Gene expression is displayed as percentage of maximum normalized reads per kilobase of transcript per million mapped reads (RPKM). Increase intensity of blue indicates increasing mRNA expression level while increasing while represents decreasing mRNA expression. (A) Significantly down-regulated genes with high normalized read counts (RPKM). Genes from functional categories enriched in the differential genes marked with arrows: prostate & AR targets (red); cell division, mitosis (green); DNA damage response (blue); WNT signaling (orange); interferon anti-viral response (pink); SARS-CoV-2 entry & response (black arrow with yellow box) and MERS-CoV entry (black arrow with beige box). (B) Significantly down-regulated genes with low overall RPKM. Genes from

functional categories enriched in the differential genes marked with arrows: steroidogenesis, lipid metabolism (brick red); neuronal (black); RTK, GPCR, cytokine signaling (red); developmental transcription factors (purple); prostate & AR targets (bright red); cell division, mitosis (green); DNA damage response (blue); WNT signaling (light orange); interferon anti-viral response (pink); circadian cycle (orange); EMT (dark blue) and SARS-CoV-2 entry & response (black arrow with yellow box). Data represent the mean from four independent (n=4) experiments performed in triplicate \pm SEM. (C) Significantly up-regulated genes with high normalized read counts (RPKM). Genes from functional categories enriched in the differential genes marked with arrows: steroidogenesis, lipid metabolism (brick red); neuronal (black); RTK, GPCR, cytokine signaling (brown); developmental transcription factors (purple); prostate & AR targets (red); cell division, mitosis (green); DNA damage response (blue); WNT signaling (orange); interferon anti-viral response (pink); circadian cycle (dark orange) and SARS-CoV-2 entry & response & pain (black arrow with yellow box). (D) Significantly up-regulated genes with low overall RPKM. Genes from functional categories enriched in the differential genes marked with arrows: steroidogenesis, lipid metabolism (brick red); neuronal (black); RTK, GPCR, cytokine signaling (dark brown); developmental transcription factors (purple); prostate & AR targets (bright red); cell division, mitosis (green); DNA damage response (blue); WNT signaling (light orange); interferon anti-viral response (pink) and circadian cycle (orange). Data represent the mean from four independent (n=4) experiments performed in triplicate \pm SEM.

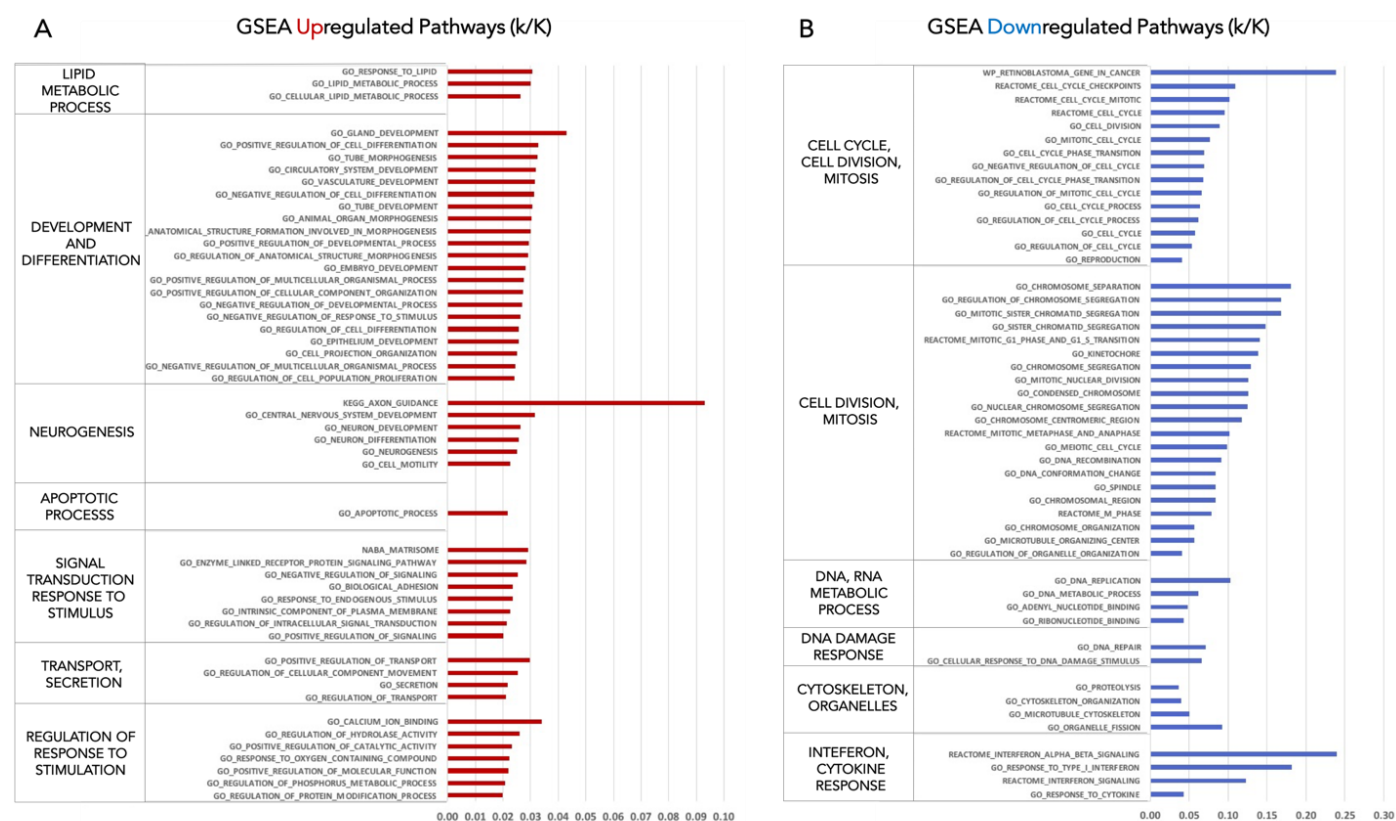


Figure S4. Gene Sets Revealed as Enriched in Differentially Expressed Genes Using Gene Set Enrichment Analysis (GSEA). (A) Enriched GSEA gene sets for genes up-regulated under APDT (red). (B) Enriched GSEA gene sets for genes down-regulated under APDT (blue). GSEA evaluates enrichment for sets of genes (gene sets) derived from multiple databases and from many experiments with data deposited in public, curated repositories and reported in the literature. Since many gene sets overlap and share a functional category theme, overlapping gene sets were downloaded from GSEA and merged to create curated sets of genes for functional categories with highly differential key regulatory genes: Interferon Signaling (102 genes), Cell Cycle (2038 genes), Circadian Clock (240 genes), Neurogenesis (1701 genes), Axon Guidance (129 genes; evaluated as a subset of Neurogenesis), Hormone Response (529 genes; including glucocorticoid response), and Steroid Receptor Signaling (385 genes). Two additional lists of genes were derived through literature review: Prostate Stem/Progenitor (96 genes) and Neuro-Endocrine Prostate Cancer (NEPC)/Neurogenic (269 genes). Gene lists for NEPC/neurogenic and prostate stem/progenitor categories were generated from the literature[73-90]. Figure S5 provides lists of GSEA pathways enriched in significantly up-regulated genes and significantly down-regulated genes. Enriched pathways for up-regulated genes include lipid metabolic process, development, differentiation, neurogenesis, apoptotic process, signal transduction response to stimulus, transcription, secretion and regulation of response to stimulation. Enriched pathways for down-regulated genes include cell cycle, cell division, mitosis, DNA/RNA metabolic process, DNA damage response, cytoskeleton, organelles, interferon and cytokine response.

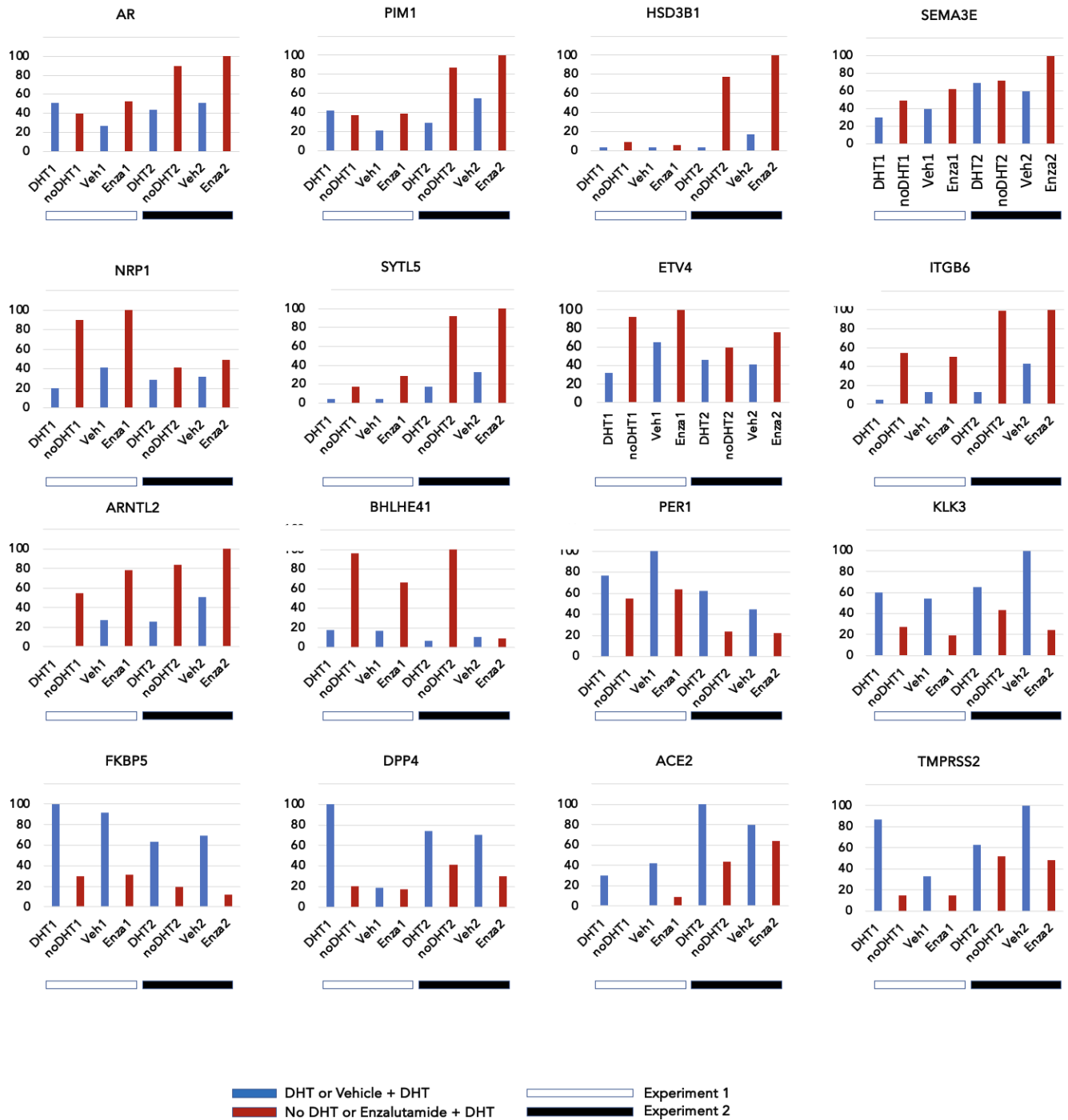


Figure S5. Comparison of Expression Levels of Individual Genes of Interest in ADT-treated PDOs. Comparisons of gene expression for selected genes of interest under different androgen signaling conditions are shown as bar graphs of percentage of maximum RPKM observed for each gene. Blue bars are PCSD1 organoid samples treated with 1nM DHT or Vehicle (0.1%DMSO) + 1nM DHT. Red bars are PCSD1 organoid samples treated with No DHT or 10 μ M Enzalutamide + 1nM DHT. Samples from Experiment 1 are shown on the left with white horizontal bar along X-axis and samples from Experiment 2 are shown on the right with black horizontal bar along X-axis.

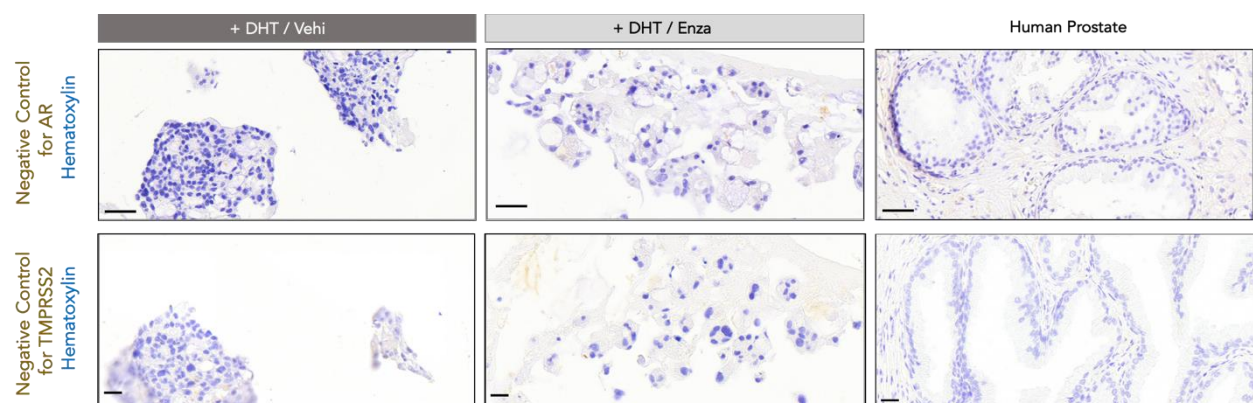


Figure S6. Isotype control of IHC analysis of AR and TMPRSS2 expression in PCSD1 organoids. Representative digital microscope images are shown of IHC isotype control of AR and TMPRSS2 IHC staining performed on 4% paraformaldehyde fixed, paraffin embedded 5 μ m. sections.

Basal (CK5) and Luminal (CK8) Epithelial Cell Markers

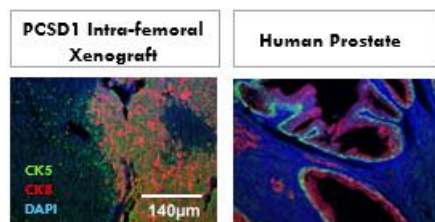


Figure S7.

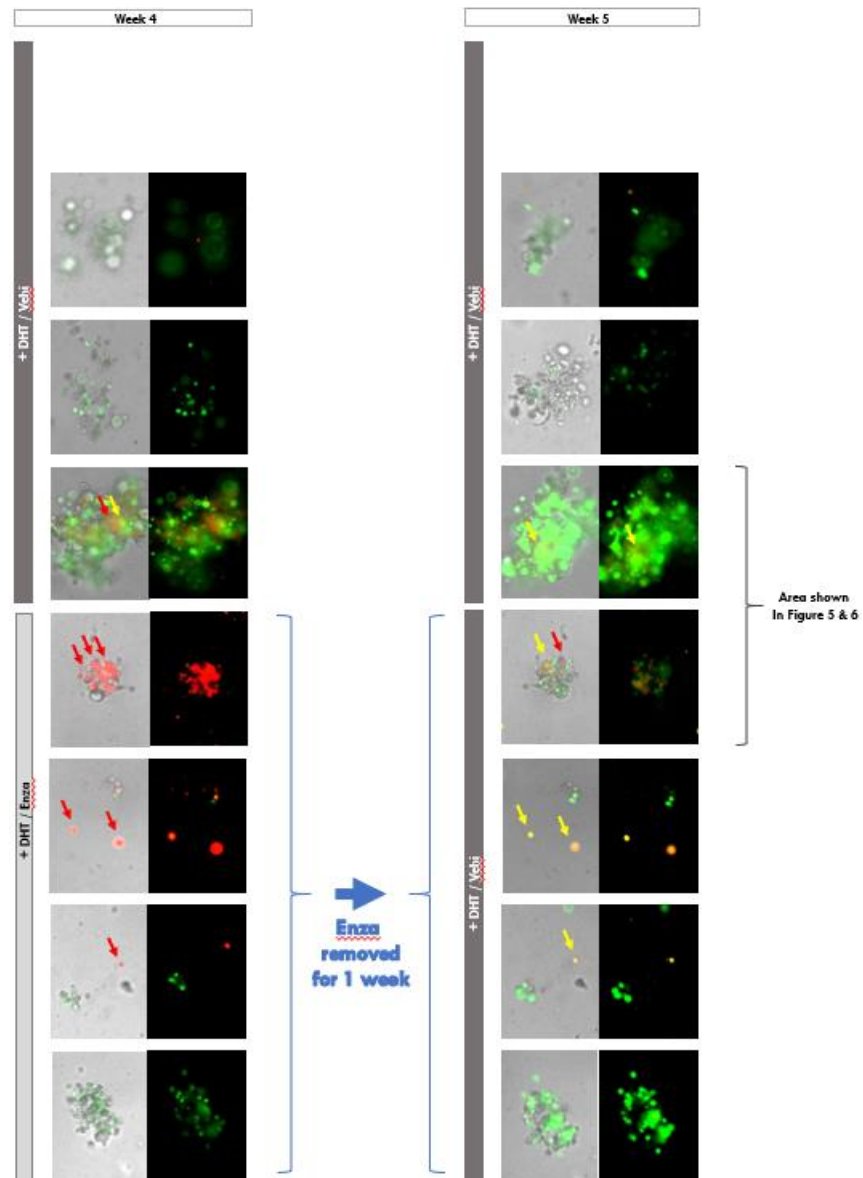


Figure S8.

Table S1. Androgen Pathway Directed Therapy (APDT) Response Genes. Full list of genes determined by Transcriptomics to be significantly up- and down-regulated in response to APDT is shown.

		787 ADT RESPONSE GENES											
# Genes	269						518						
Direction	UP						DOWN						
RPKM	LOW			HIGH			LOW			HIGH			
# Genes	98			171			206			312			
GenelDs	VILL	DCBLD1	NEURL3	APPL2	FOXO3	EXTL1	DHX58	LOC1005056	NUDT10	IRF7	IFIH1	KIF2C	ORC6
	BCAT1	ZEB1-AS1	DHR59	MTSS1	FAM129A	SULT1B1	ABCD1	ADAP1	CUX2	SKA2	C19orf48	ABC6	SLC36A1
	FAM113B	SEMA3E	PLA2G2F	WDR72	CBLB	CORT	HMGB3	C15orf42	DAPL1	VSTM2L	ERAP2	TRIM21	TAOK3
	O3FAR1	C14orf1128	LIPG	LOC1004994	SOX13	HIST1H2BM	WDR76	CTSO	DOCK8	PDE9A	SAMHD1	MXD3	RGS11
	ABCA1	HSF4	MGLL	AR	PCK2	CXCL11	ARTN	SPTB	IFIT3	PKP1	NR4A1	CRIP2	PARP9
	SHISA2	EP400NL	ZNF365	RASSF5	IL36RN	WNT3	LOC143666	RTKL1	IFIT1	KREMEN2	TCF19	GAMT	SLC10A7
	NCRNA0022	SERPINB7	TSPAN1	SH3BP5	SOX9	C9orf66	CD163L1	FBLN7	RSAD2	CCK	LOC4000403	METTL7A	BEND4
	ZNF534	C1QTNF3	UGT1A1	FER1L4	ATP13A3	ABCC2	ESPL1	DSC3	CACNG4	TMSB15A	CITED4	THOP1	ASRGL1
	MECOM	GCET2	SLCSA1	PLA2G4F	ATP8B1	PSMB8	GNN	ACTR3BP5	BST2	HMG82	TBC1D8	BUB1B	HIST2H2BE
	CA12	LNK1	NBP7	EXPH5	BAMBI	HIST1H4G	KIT	RAB9B	ZNF385B	FAM83D	COL6A1	KCNH2	NTAN1
	BHLHE41	BCAR3	FAM131B	SEMA5A	EPHA1	MNS1	DHFR	PHF11	IFI44L	RM12	NFYB	ARRB1	KCTD3
	PROX1	POGLUT1	MUC2	FAM13A	CAT	SPSB4	ADORA1	OSBP1A	MX1	CKB	PANX2	ENDOG	PALM
	RGS16	TIMP4	C10orf10	PIM1	ANO6	ALPK2	FAM189A2	TCP11L1	SCARA3	MELK	LPGAT1	NPEPL1	KDM4B
	FAM189A1	GRAMD3	PLA2G2A	THRB	PPARG	ANKRD1	BEGAIN	MTBP	FKBP5	RRM2	TACC3	SFXN5	AMOT
	PTPRE	FAM177B	CDKN2B	EGLN3	NFKBIZ	TRIM22	CIT	DUOX1	OAS2	ELOVL5	DDX60	STXBP5	FAM20C
	LOXL1	IRAK2	ZBTB7C	C20orf54	PCDH1	CTNNA2	DNAH9	LOC147804	GNMT	SORD	EZF2	DNL2	TMEM26
	TNFSF8	NTF3	SDR16C5	PLEK2	GATA2	KCNMA1	TTC39C	WAS	GABARAPL1	C1QTNF6	CPE	ECI2	TRIM3
	DIRAS2	MAN1A1	COL5A2	CYP3A5	OSBP10	IRX3	PIGK	ARSI	MALT1	DTL	PTPN21	C21orf58	C9orf80
	OPN3	ZNF860	XYLT1	TNFSF15	PLCD3	GPER	PLK4	PAIP2B	IFITM1	SOAT1	UNKL	SKA3	GTF3A
	LPAR6	LIX1L	HMGCS2	POF1B	TNFRSF21	NTF4	LOX	FU37201	SP110	CDC20	ANKH	PRKAG2	NRGN
	ENG	GPR98	MMP28	VLDLR	GNL12	CEP128	KIAA1377	MMS22L	FSTL1	CAMK2B	STEAP4	ZNF615	SMYD2
	RASAL1	NGEF	CAPN8	RHBDL2	ABLIM1	KCNH1	TMEM55A	KIAA1143	CMPK2	CROT	C16orf59	HIST1H2BH	FAM134B
	ADORA2B	EEP01	SYTL2	TRPV6	TMEM154	FBXO15	XRCC2	ZNF354A	BIRC5	HJURP	DPP4	MSI1	ZNF238
	PLA2G4C	PP15K1	POLB	OSMR	ATP2B1	C2orf55	RAD51AP1	WDR93	ISG15	MKI67	ZNF613	SLC25A33	GMMP
	IKZF3	FNNL2	LSAMP	CALN1	SLC12A2	CD200R1	BCRP3	STX2	UBE2L6	DDX58	MAOA	CTSZ	IAH1
	ITGB6	MSX2	DTX4	KIAA1211	PPP1R3B	C11orf53	LRRK1	DDHD2	REEP2	NKX3-1	LOC389831	NELL2	ISYNA1
	RNF152	C17orf109	REG4	PAK1	CDC42EP2	ZSCAN12	LOC728723	TLK2	KLK3	PRIC285	HERC3	KIF20A	GIN52
	HSPG2		GPX2	ACSL5	BICD1	OR56A3	NUDT13	LOXL2	HOXB13-AS1	UBE2C	POC1A	RTN1	MAPK12
	CCDC89		SYTL5	CABLES1	CYP39A1	PDZD2	LRFN2	MRS2P2	PARP10	GALNTL4	NEK2	MCM10	
	WNT4		TNFAIP2	OAF		UBA7	C3orf33	LOC644714	C5orf39	RASD1	CLGN	NUDT1	
	ZNF573		APCDD1	PLCD1		UGT2B10	ZNF578	CENPI	ANKRD34B	AURKA	OAS3	RAB28	
	RNF207		KCNK5	KDEL3		FLG	NR3C1	LCA5	SMOC1	CCNB1	CDK1	MRPL23	
	ALDH3B1		ACER2	PIP		CLDN8	SASS6	SLC45A1	GP2	TYMS	ZNF367	JAG2	
	CC21		TSPAN8	SLFN5		GUCY2D	FANCD2	ADAMTSL1	LAMP3	KIF11	DISP1	IFI27	
	FBXL13		LFNG	NIPAL1		KIAA1324	CDC7	LOC81691	MLLT11	MBOAT2	PPP3CA	TONSL	
	PTPRN2		VCAN	ENPP5		ZNF114	PARD6A	DD82	TNC	HMGCS1	PLEKHO1	HERC6	
	ARHGAP24		BTG2	ERV3-1		JAZF1	GPR156	WDR66	GLRX	ENDOD1	NCAPG2	TSPAN33	
	PLXNA2		C9orf150	HSD3B1		MYO16	ZNF684	PNPT1	PXDN	BRCA1	FAM101B	RNASEH2A	
	KCNIP3		GPR110	ABCC3		TMEM91	ACBD7	NTSM	CEP55	H2AFX	LEPREL1	PIK3AP1	
	DENND2D		SPNS2	ITGA2		VWA5B2	C14orf176	VRK1	MAP2	PART1	EPN1	RNF145	
	FOXO1		EPHB6	DUSP5		RARB	AKT3	REC8	HOMER2	NUF2	NRARP	CDKN2D	
	RAPGEFL1		EEF1A2	ENTPD3		OSCAR	CCDC50	ZXDB	PMEP1A	TMEM150C	RILPL2	PTTG3P	
	SLCSA7		LAD1	ZG16B		CTXN3	LOC338739	TMEM61	TOP2A	TPD52	CENPW	C9orf140	
	ARNTL2		PTGS2	LRRN1		GYG2P1	FBXO27	PRKAR2B	PPP2R2C	PDUM5	TMPPRSS2	CDC25A	
	PPP4R1L		IL1RN	BCAS1		NKX3-2	PCGF5	GCNT2	STMN1	C17orf76	IFI27L1	CCNA2	
	ITPR1		CDH26	EDEM1		KCNK13	CHRM4	TTL11	C1orf116	KLKP1	PARP14	NELF	
	SLC6A9		KCNNA4	LAMC2		SNX24	FANCM	TIFA	ARHGAP11A	ZNF331	IMPA2	TFA2P2C	
	STK10		ARHGAP26	SRGAP3		SLITRK5	PER1	KLHL25	CDC45	ZWINT	CCDC109B	AIFM2	
	FSIP2		DUSP6	STG6A11		TMPPRSS9	RECK	LOC401093	CALD1	KLF9	FLJ20021	CENPL	
	ID2B		CAMK2N1	LTBP1		ATOH8	NUMBL	MLIP	MAPK4	PLSCR1	FAM55C	FAM64A	
	AHNAK2		KIAA1462	NPAS2		SAMD14	FAM54A	C5orf34	LOC729178	ATAD2	ZNF618	LRIG1	
	XYLB		TMCS	RAP1GAP		AKR1B1	GS2	RAD51	IFI6	PLK1	STAT1	SMS	
	TGFB3		DGAT2	PLS1		CHD5	RBL1	CDADC1	IQGAP2	CDCA3	TGFBFR1	NAAA	
	MICALCL		LY6D	ELF3		C18orf2	LMTK3	FAM160B1	MZT2A	KIFC1	ERCC6L	NEURL1B	
	SATB1		FRY	TMEM51		APLP1	FRA10AC1	GLIS2	EZF1	ANKS3	NCAPH2	PARVB	
	FOXO3B		RGS2	EGFR		TTC32	C3orf58	SPS1	HIST1H2AI	RFC3	IRF9	KIAA1324L	
	B3GNT9		ROBO1	ADM2		TMCC3	C1QL1	NCRNA0008	ZNF614	ASF1B	FBXO5	MIIP	
	C17orf57		APLN	SYT1		AASS	KIF4A	THAP10	FAM43A	ANLN	FANCI	CCDC34	
	COL16A1		PCDH20	LOC149134		MLK7-AS1	PCYT1B	ACE2	SECTM1	PEX10	UBE2D1	KIAA0889	
	RFX3		ITGB4	LOC100289255		CIB3	C7orf13	TRAF3IP2-AS1	PRC1	AGPAT2	LBH	ZNF761	
	SH3RF3		SUSD4	UGCG		SP100	FAM71E1	TAPT1	TPX2	PKMYT1	GIN51	FANCG	
	FAM86C1		DAPK1	DHR53		BRIP1	DZIP1	LOC1001282	CPM	PM20D2	FSCN1	C9orf91	
	AGPAT4		OVGP1	NTN4		CDT1	MLF1IP	B3GNT4	DDX60L	FAM149A	RAP2A	TRIM36	
	43893		CNGA1	LMO4		SRSF12	C9orf21	SPRYD7	ELOVL4	PTTG1	ACOT7	UBE2E3	
	ALPK3		HK2	SERPINI1		USP18	C4orf21		PBK	PRDX6	RAMP1	RECQL4	
	LOC100287616		RCAN2	NRP1		GLTPD2	SRD5A1P1		BRP44	TRIP13	UBE2T	SMC2	
	COL3A1		TMPPRSS4	NIPAL2		LOC389676	LOC100128822		NPNT	TNFSF12, TNF	EGFL7	VWA1	
	P4HA3		ZYX	ETV4		ERAS	ZNF813		C19orf79	IFI44	CDCA8	MAPK8IP2	
	MATN2		SCIN	TMEM117		DISC1	NCRNA00294		WTIP	GYG2	AURKB	WDR34	
	GEMIN8P4		SPRY2	GALE		CDC45	C9orf167		CBR3	ANGPT2	MCM5	CHTF18	
	CES4A		TCP11L2	DISP2		DIAPH3	NXT2		FOXN1	TP53TG1	KLK4	TTY15	

Interferon Signaling			
UP	DOWN	NC HIGH RPKM	NC LOW RPKM
18		64	
18	0	40	24
BST2	(none)	ABCE1	DCST1
IFI27		ADAR	HLA-F
IFI6		CDC37	HLA-G
IFIT1		CNOT7	HLA-H
IFIT3		FADD	IFI35
IFITM1		HLA-A	IFITM2
IRF7		HLA-C	IFNA1
IRF9		HLA-E	IFNA5
ISG15		HSP90AB1	IFNB1
MX1		IFNAR1	IKBKE
OAS2		IFNAR2	IRF1
OAS3		IP6K2	IRF4
PSMB8		IRAK1	IRF5
RSAD2		IRF2	ISG20
SAMHD1		IRF3	MMP12
SP100		IRF6	NLRC5
STAT1		JAK1	PSMB8
USP18		LSM14A	SOCS1
		MAVS	SOCS3
		METTL3	SP100
		MUL1	TRIM6
		MX2	USP18
		MYD88	XAF1
		OAS1	ZBP1
		PTPN1	
		PTPN11	
		PTPN2	
		PTPN6	
		SETD2	
		SHMT2	
		STAT2	
		TBK1	
		TREX1	
		TRIM56	
		TTLL12	
		TYK2	
		UBE2K	
		WNT5A	
		YTHDF2	
		YTHDF3	

Cell Cycle			
UP	DOWN	NC HIGH RPKM	NC LOW RPKM
127		1535	
18	109	984	551
APPL2	AKT3	AAAS	ABCB1
BCAT1	ANLN	AATF	ACD
BTG2	AURKA	ABL1	ADAM17
CABLES1	AURKB	ACTB	AFAP1L2
CAMK2N1	BIRC5	ACTR10	AHCTF1
CDKN2B	BRCA1	ACTR1A	AKT3
EGFR	BRIP1	ACTR1B	ALMS1
LFNG	BUB1B	ACTR2	ALOX15B
MECOM	CCNA2	ACTR3	ANAPC1
MSX2	CCNB1	ACTR8	ANAPC4
PIM1	CDC20	ACVR1	ANKK1
PROX1	CDC25A	ACVR1B	ANKRD31
PTGS2	CDC45	ADAMTS1	ANKRD53
RGS2	CDC7	ADARB1	APAF1
SOX9	CDCA3	AKAP8	APP
SPRY2	CDCA5	AKAP8L	ARHGEF10
STK10	CDCA8	AKAP9	ARHGEF2
WNT4	CDK1	AKT1	ARID3A
	CDKN2D	AKT2	ARNTL
	CDT1	ALKBH4	ASAH2
	CENPI	ANAPC10	ASPM
	CENPL	ANAPC11	ASZ1
	CENPW	ANAPC13	ATAD5
	CEP55	ANAPC16	ATM
	CHTF18	ANAPC2	ATP2B4
	CIT	ANAPC5	ATR
	DHFR	ANAPC7	ATRIP
	DTL	ANGEL2	ATRX
	E2F1	ANK3	AURKC
	E2F2	ANKLE2	AXIN2
	ERCC6L	ANKRD17	B9D2
	ESPL1	ANXA11	BAK1
	FAM83D	APBB2	BANP
	FANCD2	APC	BCAT1
	FANCI	APEX1	BCL2
	FANCM	APEX2	BIN1
	FBXO5	APPL1	BLM
	FOXM1	ARAP1	BMP4
	GINS1	ARF1	BMP7
	GINS2	ARF6	BOLL
	HJURP	ARL3	BOP1
	KIF11	ARL8A	BORA
	KIF20A	ARL8B	BRCA2
	KIF2C	ARPP19	BRD7
	KIF4A	ASNS	BRIP1
	KIFC1	ATF2	BTBD18
	MAPK12	ATF5	BTC
	MAPK4	AURKAIP1	BTG3
	MCM10	AVP11	BTG4
	MCM5	AZI2	BTN2A2
	MELK	BABAM1	BUB1
	MIIP	BACH1	C10orf90
	MKI67	BAG6	C14orf39
	MNS1	BANF1	CAMK2A
	MTBP	BAP1	CAPN3
	MYO16	BAX	CAV2

Circadian Clock			
UP	DOWN	NC HIGH RPKM	NC LOW RPKM
15		198	
7	8	113	85
ARNTL2	ADORA1	AHCY	AANAT
BHLHE41	CDK1	ATF2	ADA
EGFR	KLF9	ATF4	ADCY1
NPAS2	NR3C1	ATF5	ADIPOQ
OPN3	PER1	BHLHE40	ADORA1
PPARG	SPSB4	BTBD9	ADORA2A
PROX1	TOP2A	BTRC	AGRP
	TYMS	CARM1	ARNTL
		CDK4	ARNTL2
		CHEK1	ASS1
		CLDN4	ATG7
		CLOCK	ATOH7
		CPT1A	ATR
		CREB1	BHLHE41
		CREBBP	CARTPT
		CREM	CHD9
		CRTC2	CHRN2
		CRTC3	CRTC1
		CRY1	DDC
		CRY2	DRD2
		CSNK1D	DRD4
		CSNK1E	EGR3
		CUL1	EZH2
		DDB1	F7
		DYRK1A	GHRHR
		EP300	GHRL
		FBXL3	GPR157
		FBXW11	GPR176
		FBXW7	HCRTR2
		GFPT1	HNFB1
		GNAI1	HNFAA
		GNAQ	HS3ST2
		GSK3B	KCNA2
		HDAC1	KCND2
		HDAC2	KLF15
		HDAC3	LEP
		HEBP1	MAGEL2
		HIF1A	MC3R
		HNRNPDP	MEF2C
		HNRNPDL	MTNR1A
		HNRNPDR	MTNR1B
		HNRNPU	NGFR
		HUWE1	NKX2-1
		ID1	NLGN1
		ID3	NMU
		ID4	NOS2
		IMPDH2	NPY2R
		JUN	NR0B2
		JUND	NR1D1
		KDM2A	NR1H3
		KDM5A	NTRK2
		KLF10	NTRK3
		MAGED1	OPN3
		MAPK10	OPRL1
		MAPK8	PER1
		MAPK9	PER2

Prostate Stem/Progenitor			
UP	DOWN	NC HIGH RPKM	NC LOW RPKM
8		58	
5	3	22	36
AR	BIRC5	BMI1	ALDH1A2
ETV4	DPP4	CARM1	ALDH8A1
ITGA2	GPER	CDH1	ATXN1
PLA2G2A		CTNNB1	BCL2
SOX9		FOXA1	BMP4
		HOXA13	BMP7
		ID4	CA9
		ITGA6	CD38
		KRT15	CD74
		KRT18	DLK1
		KRT19	EGF
		KRT7	ETS1
		LIFR	ETV1
		MYC	FGFR2
		NFE2L2	FGFR3
		RB1	IGF1
		SIRT1	IGF2
		SOX4	KRT13
		SP1	KRT4
		STAT3	KRT6A
		TACSTD2	LIF
		WNT5A	MSLN
			NES
			NRG2
			PIGR
			POU5F1
			PTEN
			RSP03
			SNAI1
			SNAI2
			TGFB1
			TNFRSF1B
			TP63
			TWIST1
			VEGFC
			WNT10B

Cell Cycle			
UP	DOWN	NC HIGH RPKM	NC LOW RPKM
127		1535	
18	109	984	551
	MZT2A	BBS4	CC2D1B
	NCAPG2	BCCIP	CCDC155
	NCAPH2	BCL2L1	CCDC36
	NEK2	BCL2L11	CCDC69
	NKX3-1	BCL6	CCDC8
	NR3C1	BCR	CCNA1
	NR4A1	BECN1	CCNB3
	NUF2	BEX2	CCND2
	ORC6	BID	CCNE1
	PARD6A	BIN3	CCNI2
	PBK	BIRC2	CCNJL
	PKMYT1	BIRC6	CCNT2
	PLK1	BLCAP	CD28
	PLK4	BLZF1	CDC14A
	PNPT1	BMI1	CDC14B
	POC1A	BOD1	CDC14C
	PPP2R2C	BRCC3	CDC25C
	PPP3CA	BRD4	CDC45
	PRC1	BTG1	CDC7
	PRKAG2	BTRC	CDCA2
	PRKAR2B	BUB3	CDH13
	PSMB8	C11orf80	CDK11A
	PTTG1	C2CD3	CDK11B
	PTTG3P	C6orf89	CDK18
	RAD51	CAB39	CDK7
	RBL1	CABLES2	CDKL1
	REC8	CALM1	CDKL2
	RFC3	CALM2	CDKL3
	RMI2	CALM3	CDKL4
	RRM2	CALR	CDKN1C
	RTKL1	CARM1	CDT1
	SASS6	CASP2	CECR2
	SKA2	CASP3	CENPA
	SKA3	CASP8AP2	CENPE
	SLC25A33	CBX3	CENPI
	SMC2	CBX5	CENPJ
	STMN1	CCAR1	CENPK
	TACC3	CCDC124	CENPN
	TAOK3	CCNB1IP1	CENPP
	TGFBR1	CCNB2	CENPQ
	TLK2	CCNC	CENPT
	TOP2A	CCND1	CEP120
	TPX2	CCND3	CEP135
	TRIM21	CCNDBP1	CEP152
	TRIM36	CCNE2	CEP192
	TRIP13	CCNF	CEP290
	TYMS	CCNG1	CEP63
	UBE2C	CCNG2	CEP70
	UBE2D1	CCNH	CEP72
	VRK1	CCNI	CEP76
	WDR76	CCNJ	CEP97
	XRCC2	CCNK	CHEK2
	ZWINT	CCNL1	CHORDC1
		CCNL2	CIT
		CCNO	CKS1B
		CCNT1	CLSPN
		CCNY	CLTCL1

Circadian Clock			
UP	DOWN	NC HIGH RPKM	NC LOW RPKM
15		198	
7	8	113	85
		MED1	PER3
		MEF2D	PIWIL2
		METTL3	PML
		MTOR	PPARA
		MYBBP1A	PPARGC1A
		MYCBP2	PRKAA2
		NAGLU	PROK1
		NAMPT	PTEN
		NCOA1	ROCK2
		NCOA2	RORA
		NCOA6	RORB
		NCOR1	RORC
		NDUFA9	RPE65
		NFIL3	SERPINE1
		NONO	SIX3
		NR1D2	SLC6A4
		NR2F6	SMARCD3
		NRIP1	SPSB4
		OGT	SRD5A1
		PHLPP1	STAR
		PPP1CA	TGS1
		PPP1CB	TH
		PPP1CC	TNFRSF11A
		PRKAA1	TP53
		PRKDC	TPH1
		PRMT5	TPH2
		PSPC1	USP2
		RAI1	USP46
		RBM4	ZFXH3
		RBM4B	
		RELB	
		RPS27A	
		RXRA	
		SETX	
		SFPQ	
		SIAH2	
		SIK1	
		SIN3A	
		SIRT1	
		SKP1	
		SREBF1	
		SRRD	
		SUV39H1	
		SUV39H2	
		TARDBP	
		TBL1X	
		TBL1XR1	
		THRAP3	
		TIMELESS	
		TOP1	
		UBA52	
		UBB	
		UBC	
		UBE3A	
		USP7	
		USP9X	
		WDR5	

NEPC/Neurogenic			
UP	DOWN	NC HIGH RPKM	NC LOW RPKM
20		180	
6	14	85	95
AR	AURKA	ABCC4	ADAM7
GATA2	AURKB	ACSL3	ASCL3
GPX2	C1orf116	AMACR	ASXL3
ITGA2	E2F1	ARHGAP8	CAND2
PROX1	FKBP5	CAMKK2	CATSPERB
SOX9	FOXM1	CCND1	CDH2
	GNMT	CCND3	CDX2
	KLF9	CDH1	CENPN
	KLK3	CDK4	CHGA
	KLK4	CREB1	CIITA
	NKX3-1	CREB3	CREB5
	NR3C1	CREB3L1	CYLD
	PMEPA1	CREB3L2	ESR1
	TMPRSS2	CREBBP	ESR2
		CREBL2	ETV5
		CSDE1	EZH2
		CTBP2	FHIT
		DICER1	FOXA2
		DNMT1	FOXB1
		EFNA4	FOXC1
		ELL2	FOXP2
		ENO2	GATA1
		EPCAM	GATA4
		EPN3	GLI1
		ERBB3	GLI2
		EVPL	GLI3
		FOLH1	HES2
		FOXA1	HES7
		FOXB1	HESX1
		FOXP1	HEY1
		GSTP1	HOXA1
		HERPUD1	HOXA5
		HES6	HOXB2
		HIF1A	HOXB3
		HOXA10	HOXB4
		HOXA11	HOXB6
		HOXA13	HOXB7
		HOXA9	HOXC10
		ID1	HOXC4
		ID3	HOXC5
		ID4	HOXC6
		ITGA6	HOXC9
		ITGB1	HOXD1
		JUN	HOXD3
		KLF10	HOXD4
		KLF13	HOXD8
		KLF16	HOXD9
		KLF3	INSM1
		KLF5	KCND2
		KLF6	KIAA0408
		KLF7	KLF1
		KLK2	KLF12
		KRT18	KLF14
		KRT19	KLF15
		LEF1	KLF17
		MAPKAPK3	KLF2
		MYC	KLF8

Cell Cycle			
UP	DOWN	NC HIGH RPKM	NC LOW RPKM
127		1535	
18	109	984	551
		CCNYL1	CNOT6L
		CCP110	CNTD1
		CCPG1	CNTD2
		CD2AP	CNTLN
		CDC123	CNTRL
		CDC16	CNTROB
		CDC23	CROCC
		CDC25B	CSNK2A2
		CDC26	CSPP1
		CDC27	CTC1
		CDC34	CUZD1
		CDC37	CUXR5
		CDC42	CYLD
		CDC5L	CYP26B1
		CDC6	CYP27B1
		CDC73	DACH1
		CDK10	DACT1
		CDK12	DBF4
		CDK13	DBF4B
		CDK14	DCDC1
		CDK16	DCLRE1B
		CDK17	DCUN1D3
		CDK19	DDX11
		CDK2	DDX4
		CDK20	DHFR
		CDK2AP1	DIRAS3
		CDK2AP2	DIS3L2
		CDK3	DLGAP5
		CDK4	DMC1
		CDK5	DMRT1
		CDK5R1	DNA2
		CDK5RAP1	DNMT3L
		CDK5RAP2	DRD2
		CDK5RAP3	DUSP13
		CDK8	DYNC1I1
		CDK9	DYNC1I2
		CDKL5	DYRK3
		CDKN1A	E2F6
		CDKN1B	E2F7
		CDKN3	E2F8
		CEBPA	EFHC1
		CENPM	EGF
		CENPO	EPGN
		CENPV	ERCC4
		CEP164	ERCC6
		CEP250	EREG
		CEP57	ERN1
		CEP68	ESCO2
		CEP78	ESPL1
		CEP85	ESRRB
		CETN2	ETAA1
		CETN3	EVIZB
		CFL1	EVIS
		CGREF1	EXD1
		CGRRF1	EXO1
		CHAF1A	EZH2
		CHD3	FAM107A

Neurogenesis			
UP	DOWN	NC HIGH RPKM	NC LOW RPKM
81		1314	
41	40	630	684
ABLIM1	ANKRD1	ABCA2	ABLIM2
APCDD1	ARTN	ABI1	ACSL4
APPL2	ATOH8	ABI2	ACTBL2
ATP8B1	AURKA	ABL1	ADAM22
BHLHE41	C1QL1	ABL2	ADCY1
BTG2	CAMK2B	ABT1	ADORA2A
COL3A1	CKK	ACAP3	ADRA2B
EGFR	CDC20	ACSL3	ADRA2C
EPHA1	CDK1	ACTB	AGBL4
EPHB6	CHD5	ACTR2	AGER
FOXO3	CIT	ADAM10	AGT
FRY	CTNNA2	ADARB1	AKNA
GATA2	CTSZ	ADCY6	ALDH1A2
LAMC2	CUX2	ADM	ALK
LMO4	DHFR	ADNP	AMIGO1
MATN2	DISC1	ADNP2	ANKRD1
NGEF	E2F1	AFG3L2	APOA1
NRP1	HMGB2	AGRN	APOD
NTF3	IRX3	AGTPBP1	APOE
NTN4	JAG2	AHI1	APP
PAK1	KIT	AKT1	ARC
PLXNA2	MAP2	AKT2	ARHGAP33
PPARG	MAPK8IP2	ALCAM	ARHGAP4
PROX1	MYO16	ALKBH1	ARHGEF10
RAP1GAP	NTF4	ALS2	ARHGEF2
RASAL1	NUMBL	ANAPC2	ARNTL
RG52	PDLIM5	ANK3	ARSB
ROBO1	PPP3CA	ANKRD27	ARTN
SEMA3E	RAP2A	ANKS1A	ARX
SEMA5A	RARB	AP2A1	ASPM
SERPINI1	SAMD14	APBB2	ASTN1
SOX13	SLITRK5	ARF1	ATCAY
SOX9	SPTB	ARF4	ATOH1
SRGAP3	STMN1	ARF6	ATOH7
SYT1	TAOK3	ARFGEF1	ATOH8
THRB	TGFBR1	ARHGAP35	ATP1B2
TNFRSF21	TNC	ARHGAP44	ATP2B2
UGCG	VSTM2L	ARHGDIA	ATP7A
VLDLR	WNT3	ARHGEF12	ATP8A2
WNT4	XRCC2	ARID1B	AUTS2
ZNF365		ARL3	AVIL
		ASAP1	AXL
		ASTN2	AZU1
		ATAT1	B4GALT6
		ATF1	BARHL1
		ATF4	BCHE
		ATF5	BCL11A
		ATL1	BCL11B
		ATXN10	BCL2
		B2M	BDNF
		B3GNT2	BEND6
		B4GALT5	BHLHA15
		BACE2	BHLHB9
		BAG5	BHLHE41
		BAIAP2	BIN1
		BAX	BLK
		BBS4	BMP4

NEPC/Neurogenic			
UP	DOWN	NC HIGH RPKM	NC LOW RPKM
20		180	
6	14	85	95
		MYH9	LHX2
		NR3C2	LHX3
		NUP93	LHX4
		OPHN1	LHX5
		PARP1	LHX6
		PPAP2A	LMAN1L
		PRKDC	LRRC16B
		PRR5	MMP2
		PSMA1	MYT1
		RB1	NCAM1
		RBBP6	NKX2-1
		RBPJ	NKX2-2
		REST	ONECUT1
		RGS10	ONECUT2
		RIPK2	ONECUT3
		SEC11C	PAX5
		SIX1	PAX8
		SLC25A37	PCSK1
		SLC44A4	PGR
		SOX4	POU2F1
		SPDEF	POU3F1
		STEAP1	POU3F2
		STEAP2	POU5F1
		SUZ12	SCGN
		TACSTD2	SEZ6
		TC2N	SNAI1
		TCF12	SNAI2
		TRIM33	SPINK1
			SYP
			SYT11
			TP53
			TP63
			TRIM9
			TWIST1
			UPK2
			ZBTB46
			ZEB1
			ZEB2

Cell Cycle			
UP	DOWN	NC HIGH RPKM	NC LOW RPKM
127		1535	
18	109	984	551
		CHEK1	FAM9A
		CHFR	FANCA
		CHMP1A	FANCD2
		CHMP1B	FANCM
		CHMP2A	FAP
		CHMP2B	FBXL22
		CHMP4A	FBXL7
		CHMP4B	FBXL8
		CHMP4C	FBXO31
		CHMP5	FBXO4
		CHMP6	FBXO43
		CHMP7	FEM1B
		CHTF8	FER
		CIB1	FES
		CINP	FGF8
		CITED2	FGFR1
		CKAP2	FGFR2
		CKAP5	FHL1
		CKS2	FIGN
		CLASP1	FKBP6
		CLASP2	FLT3LG
		CLIC1	FMN2
		CLIP1	FOSL1
		CLOCK	FOXC1
		CLTA	FOXE3
		CLTC	FOXP3
		CNOT1	FSD1
		CNOT10	FZD3
		CNOT2	FZD9
		CNOT3	GAS1
		CNOT4	GAS2
		CNOT6	GAS6
		CNOT7	GDPD5
		CNOT8	GEM
		CNPPD1	GEN1
		COPS5	GFI1
		CRADD	GINS3
		CREBL2	GIN54
		CRLF3	GJA1
		CRY1	GJC2
		CSNK1A1	GLI1
		CSNK1D	GPNMB
		CSNK1E	GPR3
		CSNK2A1	GRK5
		CSNK2B	HACE1
		CTBP1	HAUS1
		CTCF	HAUS3
		CTDNEP1	HAUS5
		CTDP1	HAUS6
		CTDSP1	HAUS7
		CTDSP2	HECW2
		CTDSPL	HELLS
		CTNNB1	HEPACAM2
		CUL1	HERC2
		CUL2	HFM1
		CUL3	HHEX
		CUL4A	HLA-G

Neurogenesis			
UP	DOWN	NC HIGH RPKM	NC LOW RPKM
81		1314	
41	40	630	684
		BCL6	BMP5
		BHLHE40	BMP7
		BLOC1S1	BMPR1A
		BLOC1S2	BMPR2
		BLOC1S3	BOC
		BMP6	BTBD8
		BMPR1B	BTG4
		BNIP3	C1QL1
		BOK	C21orf91
		BSG	C3
		BTBD1	C5AR1
		BTBD2	C8orf37
		BTBD3	CABP4
		BTBD6	CAMK1D
		C12orf57	CAMK2A
		C9orf72	CCDC88A
		CALR	CCKAR
		CAMK2G	CD38
		CAMSAP1	CDH2
		CAPRIN1	CDH23
		CAPRIN2	CDH4
		CARM1	CDHR1
		CASP3	CDKL3
		CASZ1	CDNF
		CBFA2T2	CDON
		CD9	CELSR1
		CDC42	CELSR3
		CDH1	CEND1
		CDK16	CEP120
		CDK5	CEP290
		CDK5R1	CHD5
		CDK5RAP1	CHD7
		CDK5RAP2	CHL1
		CDK5RAP3	CHN1
		CDKL5	CHODL
		CEBPB	CHRM1
		CELSR2	CHRNA3
		CERS2	CHRNA2
		CFL1	CIT
		CFL2	CLU
		CFLAR	CNR1
		CIB1	CNTF
		CLCF1	CNTN2
		CLMN	CNTN4
		CLN5	CNTN6
		CNP	CNTNAP1
		CNTF	CNTNAP2
		COBL	COL3A1
		COPS2	CPEB3
		CPNE1	RBM1CPNE5
		CREB1	CPNE9
		CREB3L2	CRABP2
		CRK	CRB1
		CRKL	CRMP1
		CSK	CRTAC1
		CSNK1D	CRTC1
		CSNK1E	CSF1

Axon Guidance			
UP	DOWN	NC HIGH RPKM	NC LOW RPKM
13		108	
12	1	51	57
ABLM1	PPP3CA	ABL1	ABLM2
EPHA1		ARHGEF12	CXCL12
EPHB6		CDC42	CXCR4
NGEF		CDK5	DCC
NRP1		CFL1	DPYSL2
NTN4		CFL2	DPYSL5
PAK1		EFNA1	EFNB1
PLXNA2		EFNA3	EPHA3
ROBO1		EFNA4	EPHA4
SEMA3E		EPHA2	EPHA5
SEMA5A		EPHB2	EPHA6
SRGAP3		EPHB3	EPHA7
		GNAI1	EPHA8
		GNAI2	EPHB1
		GNAI3	EPHB4
		GSK3B	FES
		HRAS	FYN
		ITGB1	L1CAM
		KRAS	LRRC4C
		LIMK1	MET
		LIMK2	NFAT5
		MAPK1	NFATC1
		MAPK3	NFATC2
		NCK1	NFATC4
		NCK2	NGEF
		NFATC3	NRAS
		PAK2	NTN1
		PAK4	NTN3
		PAK6	PLXNA2
		PLXNA1	PLXNB3
		PLXNA3	PLXNC1
		PLXNB1	PPP3CC
		PLXNB2	PPP3R2
		PPP3CB	RAC2
		PPP3R1	RASA1
		PTK2	RND1
		RAC1	ROBO2
		RAC3	ROBO3
		RGS3	ROCK2
		RHOA	SEMA3A
		RHOD	SEMA3C
		ROCK1	SEMA3D
		SEMA3B	SEMA3E
		SEMA3F	SEMA3G
		SEMA4A	SEMA4F
		SEMA4B	SEMA4G
		SEMA4C	SEMA5B
		SEMA4D	SEMA6B
		SEMA6A	SEMA6C
		SLIT1	SEMA6D
		SRGAP2	SEMA7A
			SLIT1
			SLIT2
			SLIT3
			SRGAP1
			UNC5A
			UNC5C

Cell Cycle			
UP	DOWN	NC HIGH RPKM	NC LOW RPKM
127		1535	
18	109	984	551
		CUL4B	HMGN5
		CUL5	HORMAD1
		CUL7	HSPA2
		CUL9	HUS1B
		CYP1A1	HYAL1
		DAB2IP	IFNW1
		DAPK3	IGF1
		DCLRE1A	IGF2
		DCTN1	IKZF1
		DCTN2	IL1A
		DCTN3	INCA1
		DDB1	INHA
		DDIT3	INHBA
		DDRGK1	INO80
		DDX39B	INSM1
		DDX3X	INSM2
		DHCR24	IRF1
		DIDO1	ITGB3BP
		DKC1	JAK2
		DLG1	KAT2B
		DMTF1	KATNB1
		DNM2	KIAA1614
		DNMT3A	KIF14
		DONSON	KIF15
		DOT1L	KIF18A
		DRG1	KIF18B
		DSCC1	KIF20B
		DSN1	KIF23
		DUSP1	KIF25
		DUSP3	KIF4A
		DYNC1H1	KIF4B
		DYNC1LI1	KLHDC8B
		DYNC1LI2	KLHL13
		DYNLL1	KLK10
		DYNLL2	KNTC1
		DYNLT1	L3MBTL1
		DYNLT3	LATS2
		DYRK1A	LEP
		E2F3	LIF
		E2F4	LIG1
		E2F5	LIN37
		E4F1	LIN54
		ECD	LIN9
		ECT2	LPIN3
		EDN1	LSM11
		EED	LZTS1
		EHMT1	MAD1L1
		EHMT2	MAEL
		EID1	MAGI2
		EIF2AK4	MAP3K8
		EIF4E	MAPK15
		EIF4EBP1	MAPRE2
		EIF4G1	MARVELD1
		EIF4G2	MCM8
		EMD	MCPH1
		EME1	MCTS1
		EME2	MDM1

Neurogenesis			
UP	DOWN	NC HIGH RPKM	NC LOW RPKM
81		1314	
41	40	630	684
		CTDSP1	CSF1R
		CTNNA1	CSMD3
		CTNNB1	CSPG4
		CTTN	CSPG5
		CUL4B	CTF1
		CUL7	CTHRC1
		CUX1	CTNNA2
		CYB5D2	CTNND2
		CYFIP1	CX3CR1
		DAB2IP	CXCL12
		DAG1	CXCR4
		DAGLB	DAAM2
		DAPK3	DAB1
		DBN1	DAGLA
		DBNL	DCC
		DDIT4	DDC2
		DDR1	DCHS1
		DDX56	DCLK1
		DDX6	DCLK2
		DENND5A	DCT
		DGUOK	DHFR
		DHX36	DIO3
		DICER1	DISC1
		DISC1	DIXDC1
		DKK1	DLG4
		DLG5	DLL1
		DLX1	DLL3
		DNM1L	DLL4
		DNM2	DLX2
		DNMT3A	DLX5
		DTNBP1	DNER
		DUSP10	DNM3
		DVL1	DNMT3B
		DVL2	DOCK10
		DVL3	DOCK7
		DYNLT1	DOK1
		ECT2	DOK4
		EED	DOK6
		EEF2	DPYSL2
		EEF2K	DPYSL5
		EFNA1	DRD1
		EFNA3	DRD2
		EFNA4	DTX1
		EHD1	DUOXA1
		EIF2AK4	DYNC2H1
		EIF2B1	EDNRB
		EIF2B2	EFHC2
		EIF2B3	EFHD1
		EIF2B4	EFNB1
		EIF2B5	EGR2
		EIF4E	EIF4ENIF1
		EIF4G1	ELL3
		EML1	ELP3
		ENAH	EMB
		ENC1	EMX1
		EP300	EMX2
		EPHA2	EN2

Home Response			
UP	DOWN	NC HIGH RPKM	NC LOW RPKM
29		398	
16	13	149	249
APLN	ABCC2	AACS	AANAT
C1QTNF3	ACE2	ABAT	ABCC2
CYP3A5	ADORA1	ACAA1	ABCC8
DGAT2	AKR1B1	ADM	ACE
DHRS3	ARRB1	AIMP1	ACE2
DHRS9	CPE	ALDH1A3	ACHE
EGFR	CTS2	ALDH9A1	ACSL4
HSD3B1	DPP4	ARL2	ACVR1C
IL1RN	DUOX1	ARL2B2	ACVR2B
ITPR1	NKX3-1	ARNT	ADCY5
PTPRN2	PER1	ATP1A1	ADH1A
RFX3	PPP3CA	ATP6AP2	ADH1B
SDR16C5	SULT1B1	BACE2	ADH1C
SLC5A7		BAD	ADH6
UGT1A1		BAIAP3	ADH7
WNT4		BCAT2	ADIPOQ
		BMP6	ADORA1
		C2CD2L	ADRA2C
		CAMK2G	AGT
		CAPN10	AGTR1
		CDK16	AKR1B1
		CLCN2	AKR1B10
		CLOCK	AKR1B15
		COMT	AKR1C3
		CPT1A	ALDH1A1
		CREB1	ALDH1A2
		CRY1	ALDH8A1
		CRY2	ANO1
		CYP1A1	APOA1
		CYP2R1	ARNTL
		DGAT1	AWAT2
		DGKQ	BCO2
		DHCR7	BLK
		DHRS11	BMP5
		ECE1	BMP8A
		ECE2	C1QTNF1
		EDN1	C1QTNF3
		ENSA	CACNA1C
		ENY2	CACNA1D
		FAM3B	CACNA1E
		FDX1	CACNA1H
		FOXA1	CACNA2D2
		FURIN	CARTPT
		FZD4	CASR
		GHR	CCKAR
		GLUD1	CCL5
		GLUL	CD38
		GNAS	CFTR
		HADH	CGA
		HIF1A	CHD7
		HMGCR	CHST8
		HMGN3	CHST9
		HPN	CMA1
		HSD17B11	CNR1
		HSD17B12	COLQ
		HSD17B4	CORIN
		ICA1	CPLX1

Cell Cycle			
UP	DOWN	NC HIGH RPKM	NC LOW RPKM
127		1535	
18	109	984	551
		EML1	MDM4
		EML4	MECOM
		ENSA	MEI1
		EP300	MICAL3
		EPB41	MIS18BP1
		EPB41L2	MLF1
		EPC1	MLH3
		EPS8	MLXIPL
		ERCC1	MND1
		ERCC2	MNS1
		ERCC3	MOV10L1
		ERF	MGRPRX2
		ERH	MSH3
		ESCO1	MSH4
		EZR	MSTO1
		FAM32A	MSX1
		FBXL12	MSX2
		FBXL18	MTBP
		FBXL3	MYB
		FBXO6	MYBL1
		FBXO7	MYO16
		FBXW11	MYOCD
		FBXW5	NAE1
		FBXW7	NANOS3
		FEN1	NCAPG
		FGFR1OP	NCAPH
		FIGNL1	NDC80
		FKBP1	NEK1
		FLCN	NEK10
		FLNA	NEK11
		FOXA1	NEK3
		FOXG1	NEK9
		FOXO4	NES
		FZR1	NME7
		GADD45A	NOTCH1
		GADD45B	NOX5
		GADD45G	NPAT
		GADD45GIP1	NPM2
		GAK	NPR2
		GAR1	NR2E1
		GAS2L1	NR4A3
		GATA6	NSL1
		GBF1	NUP107
		GIGYF2	NUP155
		GIPC1	NUP35
		GIT1	OFD1
		GMNN	ORC1
		GNAI1	ORC4
		GNAI2	PARD3B
		GNAI3	PARD6A
		GOLGA2	PARD6B
		GORASP1	PARD6G
		GORASP2	PARP3
		GSK3B	PAX6
		GSPT1	PCGF2
		GTF2H1	PCGF6
		GTPBP4	PDE3A

Neurogenesis			
UP	DOWN	NC HIGH RPKM	NC LOW RPKM
81		1314	
41	40	630	684
		EPHB2	EOMES
		EPHB3	EPHA10
		ERBB2	EPHA3
		ERBB3	EPHA4
		ERCC2	EPHA5
		ERCC3	EPHA6
		ESRP1	EPHA7
		ETV6	EPHA8
		EXT1	EPHB1
		EZR	EPHB4
		FAZH	EPO
		FARP1	ERBB4
		FARP2	ERCC6
		FBXO38	ETV1
		FBXO45	ETV5
		FBXO7	EVX1
		FBXW8	EYA1
		FEZ2	EZH2
		FGF13	F2
		FKBP4	FAIM
		FLNA	FAIM2
		FLOT1	FAT4
		FMR1	FBXO31
		FOXA1	FES
		FOXG1	FEV
		FRS2	FEZ1
		FUT9	FEZF1
		FZD1	FGF5
		FZD4	FGF8
		FZD5	FGFR1
		GAB2	FGFR2
		GAK	FIG4
		GBA2	FKBP1B
		GDF11	FLRT1
		GDI1	FLRT2
		GIGYF2	FLRT3
		GNAI1	FN1
		GNAI2	FOXA2
		GNAI3	FOXB1
		GOLGA4	FOXO1
		GORASP1	FOXN4
		GPC1	FRYL
		GPC2	FSCN2
		GRB10	FSTL4
		GRB2	FYN
		GRB7	FZD2
		GRN	FZD3
		GSK3A	FZD7
		GSK3B	FZD8
		GSTP1	FZD9
		HDAC1	GAB1
		HDAC11	GABRA5
		HDAC2	GALR2
		HDAC5	GAS6
		HDAC6	GAS7
		HES6	GBX1
		HEXB	GBX2

Home Response			
UP	DOWN	NC HIGH RPKM	NC LOW RPKM
29		398	
16	13	149	249
		IDE	CPLX3
		ILDR1	CRABP1
		IRS2	CRABP2
		ITPR3	CRHR1
		ITSN1	CRYM
		JAGN1	CYB5R4
		KCN53	CYP11A1
		KDM5B	CYP17A1
		KIFS5	CYP19A1
		KLF7	CYP26A1
		LRP5	CYP26B1
		LYN	CYP27A1
		MCU	CYP27B1
		MECP2	CYP27C1
		MED1	CYP2D6
		MIDN	CYP2S1
		MYRIP	CYP3A4
		NADK	CYP3A7
		NFKB1	CYP46A1
		NLGN2	DDO
		OXCT1	DHRS2
		PARK7	DIO1
		PCSK6	DIO2
		PCSK7	DIO3
		PFKFB2	DKK3
		PFKL	DKKL1
		PHB	DOC2B
		PHPT1	DRD2
		PIM3	DUOX1
		PLEKHA1	DUOX2
		POR	DUOXA1
		PPARD	DUOXA2
		PPP3CB	ENPEP
		PPP5C	EPHA5
		PRKCA	ESR1
		PSMD9	EXOC3L1
		PTPN11	FAM3D
		RAB11B	FDXR
		RAB11FIP1	FFAR2
		RAB11FIP3	FGA
		RAB11FIP5	FGB
		RAB1A	FGFR1
		RAC1	FKBP1B
		RAF1	FOXA2
		RAP1A	FOXD1
		RDH11	FOX E1
		RDH13	FOX L2
		RDH14	FSHB
		RDH16	GAL
		REST	GCG
		RETSAT	GCNT4
		SAFB	GDF9
		SCARB1	GFI1
		SCPEP1	GHRHR
		SERP1	GHRL
		SGPL1	GIPR
		SIDT2	GJA1

Cell Cycle			
UP	DOWN	NC HIGH RPKM	NC LOW RPKM
127		1535	
18	109	984	551
		HAUS2	PDGFB
		HAUS4	PDGFRB
		HAUS8	PER2
		HBP1	PHC1
		HCFC1	PHC3
		HDAC1	PIAS1
		HDAC3	PIBF1
		HDAC8	PIF1
		HECA	PIK3C3
		HERC5	PIK3R4
		HEXIM1	PINX1
		HEXIM2	PIWIL2
		HINFP	PIWIL3
		HIPK2	PIWIL4
		HIRA	PKD1
		HMG20B	PKHD1
		HNRNPU	PKN2
		HRAS	PLAGL1
		HSF1	PLCB1
		HSP90AA1	PLK3
		HSP90AB1	PLK4
		HSPA1A	PLK5
		HSPA1B	PML
		HTRA2	PNPT1
		HTT	POLA1
		HUS1	POLE2
		ID1	POM121
		ID3	POM121C
		ID4	POT1
		IK	POU4F1
		ILK	PPM1D
		INCENP	PPP1R1C
		ING1	PRDM11
		ING2	PRDM5
		ING4	PRDM9
		INSR	PRIM1
		INTS3	PRKAA2
		INTS7	PRKAG3
		IPO5	PRKAR2B
		IPO7	PRKCB
		IQGAP1	PRKCE
		IRF6	PRR11
		ITGB1	PSMB10
		JMY	PSMB11
		JTB	PSMB8
		JUN	PSMB9
		JUNB	PSMC1
		JUND	PSMC6
		KANK2	PSME2
		KAT2A	PTEN
		KAT5	PTPRC
		KATNA1	RAB6C
		KCTD11	RAD51
		KHDRB51	RAD51B
		KIAA0753	RAD51D
		KIF13A	RAD54L
		KIF2A	RAD9B

Neurogenesis			
UP	DOWN	NC HIGH RPKM	NC LOW RPKM
81		1314	
41	40	630	684
		HIF1A	GCM1
		HIPK1	GCM2
		HIPK2	GDF5
		HMG20B	GDF6
		HPRT1	GDF7
		HRAS	GDNF
		HSP90AA1	GDPD5
		HSP90AB1	GFI1
		HSPA5	GFRA1
		HTRA2	GFRA3
		ID1	GHRL
		ID3	GJA1
		ID4	GJC2
		IDH2	GLDN
		IER2	GLI2
		IFRD1	GLI3
		IFT140	GNAT1
		IFT20	GNAT2
		IFT27	GNNRH1
		IGSF9	GPM6B
		IL6ST	GPR157
		ILK	GPR17
		INPP5F	GPR173
		IQGAP1	GPR183
		IQSEC1	GPR37L1
		IRS2	GPRC5B
		IRX2	GPRIN1
		ITGA3	GPRIN1
		ITGA6	GRIN2A
		ITGB1	GRIP1
		ITM2C	GSX1
		ITSN1	HAP1
		JUN	HDAC10
		KANK1	HDAC9
		KCTD11	HECW1
		KDM1A	HECW2
		KDM4C	HERC1
		KIDINS220	HES2
		KIF13B	HES7
		KIF1A	HEY1
		KIF3A	HHIP
		KIF5B	HMG20A
		KIF5C	HMGB1
		KLF7	HOOK3
		KRAS	HOXB3
		KREMEN1	HOXC10
		LAMA5	HOXD1
		LAMB2	HOXD3
		LDB1	HOXD9
		LDLR	HS6ST1
		LEF1	IFT172
		LEMD2	IFT88
		LIG4	IGSF10
		LIMK1	IHH
		LIMK2	IL1RAPL1
		LLGL1	IL33
		LLPH	IL34

Home Response			
UP	DOWN	NC HIGH RPKM	NC LOW RPKM
29		398	
16	13	149	249
		SIN3A	GLP1R
		SIRT3	GNB3
		SLC16A1	GPLD1
		SLC25A5	GPR27
		SLC2A1	GPR68
		SLC44A4	GRP
		SLCO4A1	HCAR2
		SMAD2	HFE
		SMAD4	HNFB1A
		SNAP23	HNFB1B
		SNX19	HNFB4A
		SNX4	HSD17B1
		SOX4	HSD17B14
		SREBF1	HSD17B3
		SRI	HSD17B6
		STARD3	HSD17B7
		STARD3NL	HSD17B8
		STAT5B	HSD3B2
		STC2	HTR2C
		STUB1	IL11
		STX1A	ILDR2
		STX4	INHBA
		STXBP3	INHBA
		SYBU	INHBB
		SYT7	IRS1
		TARDBP	ISL1
		TM7SF3	ITPR1
		TMF1	ITPR2
		TRERF1	IYD
		TRPM4	JAK2
		TSPO	KALRN
		UBE2Q1	KCNB1
		VAMP8	KCNC2
		YWHAH	KCNG2
		ZMPSTE24	KCNJ11
			KLK6
			LEP
			LHB
			LIF
			LMO3
			LRP1
			LRP5L
			LTBP4
			MAFA
			MME
			MTNR1B
			MYB
			MYOSA
			NDUFAF2
			NKX6-1
			NMB
			NMU
			NNAT
			NOS2
			NPFF
			NPPA
			NROB2

Cell Cycle			
UP	DOWN	NC HIGH RPKM	NC LOW RPKM
127		1535	
18	109	984	551
		KIF3A	RARA
		KIF3B	RASA1
		KLHDC3	RASSF4
		KLHL18	RBL1
		KLHL21	RBM7
		KLHL22	REC8
		KLHL9	RFPL1
		KPNB1	RFWD3
		KRT18	RGS14
		L3MBTL2	RHEB
		LAMTOR1	RIF1
		LAMTOR2	RNASEH2B
		LAMTOR3	RNF112
		LATS1	RNF2
		LBR	RNF212
		LCMT1	ROCK2
		LEMD2	ROPN1B
		LEMD3	RPA3
		LIG3	RPA4
		LIG4	RPRM
		LIN52	RPS27L
		LLGL1	RTTN
		LLGL2	RXFP3
		LMLN	SASS6
		LMNA	SDCCAG8
		LMNB1	SETDB2
		LPIN1	SFI1
		LPIN2	SH3GLB1
		LRP5	SHCBP1L
		LRP6	SIPA1
		LRRCC1	SIX3
		LSM10	SLC26A8
		LYN	SLC38A9
		LZTS2	SLC39A5
		MAD2L1BP	SLC6A4
		MADD	SLFN11
		MAEA	SLX4
		MAP2K1	SMARCD3
		MAP2K6	SMC1B
		MAP4	SMOC2
		MAP9	SMPD3
		MAPK1	SOX11
		MAPK13	SPAG8
		MAPK14	SPAST
		MAPK3	SPC24
		MAPK6	SPC25
		MAPK7	SPDYA
		MAPRE1	SPDYC
		MAPRE3	SPHK1
		MARK4	SPICE1
		MASTL	SPIN2B
		MAU2	SPRY1
		MAX	SSTR5
		MCM3	SSX2IP
		MCM4	STAG1
		MCM6	STAG3
		MCM7	STAG3L1

Neurogenesis			
UP	DOWN	NC HIGH RPKM	NC LOW RPKM
81		1314	
41	40	630	684
		LMTK2	INHBA
		LRP12	INPP5J
		LRP6	INSM1
		LRP8	INSM2
		LSM1	IRX3
		LYN	IRX4
		LYPLA2	IRX5
		MACF1	IRX6
		MAN2A1	ISL1
		MANF	ISL2
		MAP1B	ITGA1
		MAP1S	ITGA4
		MAP2K1	ITPKA
		MAP3K13	ITSN2
		MAP4	JAK2
		MAP4K4	JAM3
		MAPK1	KALRN
		MAPK3	KATNB1
		MAPK6	KCNIP2
		MAPK7	KCNJ10
		MAPK8IP3	KEL
		MAPT	KIAA0319
		MARK2	KIF20B
		MBD1	KIF5A
		MBOAT7	KIRREL3
		MDM2	KIT
		MECP2	KLF15
		MED1	KLK6
		MED12	KNDC1
		MEGF8	L1CAM
		METRN	LAMA1
		METTTL14	LAMA2
		METTTL3	LAMA3
		MIB1	LAMC3
		MICALL1	LEP
		MICALL2	LEPR
		MINK1	LGALS1
		MMD	LG14
		MOB2	LGR6
		MOV10	LHFPL5
		MPP5	LHX2
		MTCH1	LHX3
		MTMR2	LHX4
		MTOR	LHX5
		MTPN	LHX6
		MUL1	LIF
		MXRA8	LINGO1
		MYCBP2	LMX1B
		MYEF2	LPAR3
		MYH10	LRIG2
		MYO6	LRP1
		NAB1	LRP2
		NAB2	LRP4
		NAGLU	LRRC4C
		NAP1L1	LRRC7
		NAP1L2	LRTM2
		NAPA	LRTOMT

Home Response			
UP	DOWN	NC HIGH RPKM	NC LOW RPKM
29		398	
16	13	149	249
		NR1D1	
		NR5A1	
		OSM	
		PASK	
		PAX8	
		PCLO	
		PCSK1	
		PCSK4	
		PDGFRA	
		PER1	
		PER2	
		PLA2G6	
		PLB1	
		PNPLA4	
		POMC	
		PPARGC1A	
		PRKCE	
		PRLHR	
		PTPRN	
		PTPRN2	
		RAB11FIP2	
		RAB8B	
		RAPGEF3	
		RAPGEF4	
		RASL10B	
		RBP1	
		RBP4	
		RDH12	
		RDH5	
		REN	
		RFX3	
		RFX6	
		RIMS2	
		RPE65	
		RPH3AL	
		SCG5	
		SCT	
		SIRT4	
		SLC16A10	
		SLC16A2	
		SLC25A4	
		SLC30A8	
		SLC5A5	
		SLC5A7	
		SLC9B2	
		SLCO1C1	
		SMPD3	
		SNAP25	
		SOX11	
		SOX8	
		SRD5A1	
		SRD5A2	
		SSTR5	
		STAR	
		STXBP4	
		STXBP5L	
		SULT1B1	

Cell Cycle			
UP	DOWN	NC HIGH RPKM	NC LOW RPKM
127		1535	
18	109	984	551
		MCMBP	
		MDC1	
		MDM2	
		MECP2	
		MED1	
		MED25	
		MEN1	
		MEPCE	
		METTL3	
		MGA	
		MIF	
		MIS12	
		MITD1	
		MLH1	
		MLST8	
		MNAT1	
		MNT	
		MSH2	
		MSH6	
		MTA3	
		MTOR	
		MUC1	
		MUS81	
		MX2	
		MYBBP1A	
		MYC	
		MYH10	
		MYH9	
		MYO19	
		MZT1	
		NAA10	
		NAA50	
		NACC2	
		NASP	
		NBN	
		NCAPD2	
		NCOR1	
		NDE1	
		NDEL1	
		NEDD9	
		NEK4	
		NEK6	
		NEK7	
		NF2	
		NFE2L1	
		NHP2	
		NIN	
		NIPBL	
		NLE1	
		NME6	
		NOLC1	
		NOP10	
		NOTCH2	
		NPM1	
		NR2F2	
		NSFL1C	
		NSMCE2	
		STAG3L2	
		STAG3L3	
		STARD9	
		STEAP3	
		STIL	
		STK10	
		STK33	
		STOX1	
		STRADB	
		STXBP4	
		SUGT1	
		SUSD2	
		SYCE2	
		SYCP3	
		SYNE1	
		TAF1	
		TAF1L	
		TAL1	
		TAS2R13	
		TBCE	
		TCF7L2	
		TDRD1	
		TDRD12	
		TDRD9	
		TDRKH	
		TERF1	
		TERF2	
		TERT	
		TEX11	
		TEX12	
		TEX14	
		TEX19	
		TFDP2	
		TFDP3	
		TGFB1	
		TGM1	
		THAP5	
		THOC5	
		TIPIN	
		TLK1	
		TLK2	
		TMEM67	
		TNF	
		TNKS	
		TP53	
		TP73	
		TRIM71	
		TTBK1	
		TTC28	
		TTK	
		TTN	
		TTYH1	
		TUBA3C	
		TUBA3D	
		TUBA3E	
		TUBA4B	
		TUBA8	

Neurogenesis			
UP	DOWN	NC HIGH RPKM	NC LOW RPKM
81		1314	
41	40	630	684
		LMTK2	INHBA
		LRP12	INPP5J
		LRP6	INSM1
		LRP8	INSM2
		LSM1	IRX3
		LYN	IRX4
		LYPLA2	IRX5
		MACF1	IRX6
		MAN2A1	ISL1
		MANF	ISL2
		MAP1B	ITGA1
		MAP1S	ITGA4
		MAP2K1	ITPKA
		MAP3K13	ITSN2
		MAP4	JAK2
		MAP4K4	JAM3
		MAPK1	KALRN
		MAPK3	KATNB1
		MAPK6	KCNIP2
		MAPK7	KCNJ10
		MAPK8IP3	KEL
		MAPT	KIAA0319
		MARK2	KIF20B
		MBD1	KIF5A
		MBOAT7	KIRREL3
		MDM2	KIT
		MECP2	KLF15
		MED1	KLK6
		MED12	KNDC1
		MEGF8	L1CAM
		METRN	LAMA1
		METTL14	LAMA2
		METTL3	LAMA3
		MIB1	LAMC3
		MICALL1	LEP
		MICALL2	LEPR
		MINK1	LGALS1
		MMD	LGI4
		MOB2	LGR6
		MOV10	LHFPL5
		MPP5	LHX2
		MTCH1	LHX3
		MTMR2	LHX4
		MTOR	LHX5
		MTPN	LHX6
		MUL1	LIF
		MXRA8	LINGO1
		MYCBP2	LMX1B
		MYEF2	LPAR3
		MYH10	LRIG2
	MYO6	LRP1	
	NAB1	LRP2	
	NAB2	LRP4	
	NAGLU	LRRC4C	
	NAP1L1	LRRC7	
	NAP1L2	LRTM2	
	NAPA	LRTOMT	

Steroid Receptor Signaling			
UP	DOWN	NC HIGH RPKM	NC LOW RPKM
27		301	
14	13	146	155
AR	ABCC2	ABCA2	AANAT
ATP2B1	BRCA1	ABCA3	ABCC2
EGFR	HMG2	ABHD2	ACR
ENG	KLF9	ADAM9	ACSBG1
FOXO1	LBH	ADM	ACTA1
HSD3B1	LOX	AIFM1	ADIPOQ
IL1RN	NKX3-1	AKAP13	AGL
PAK1	NR3C1	ALAD	AGXT
PCK2	NR4A1	ARID1A	AKR1C3
PPARG	PER1	ARRB2	ALDH3A1
PTGS2	PM2PA1	ATP1A1	ALPL
TGFB3	RARB	AXIN1	ANXA3
THRB	TYMS	BAD	APOA2
UGT1A1		BCL2L11	AQP1
		BMP6	ARG1
		CA2	ARNTL
		CAD	ASS1
		CALCOCO1	ATP1A2
		CALM3	ATP1A3
		CALR	AVPR1A
		CARM1	BCHE
		CASP3	BCL2
		CASP9	BGLAP
		CBFB	BMP4
		CBX3	BMP7
		CCND1	CALCR
		CDKN1A	CATSPER2
		CFLAR	CATSPER3
		CLDN4	CATSPER4
		CLOCK	CATSPERB
		CNOT1	CATSPERG
		CNOT2	CAV1
		CRY1	CCNE1
		CRY2	CD38
		CTNNB1	CDK7
		DAXX	CDO1
		DDIT4	CNGA3
		DDR1G1	COL1A1
		DDX17	CPS1
		DDX5	CSN1S1
		DDX54	CYBA
		DNAJA1	CYBB
		DSG2	CYP7B1
		DUSP1	DAB2
		EDN1	DNMT3B
		EGLN2	DSG1
		EIF4E	ENG
		EIF4EBP1	EPO
		EP300	ESR1
		ERRF1	ESR2
		ESRRA	ESRRB
		FBXO32	ESRRG
		FKBP4	FAM107A
		FOXA1	FHL2
		FOXP1	FLT3
		GBA	FOSB
		GLB1	FOSL1

Cell Cycle			
UP	DOWN	NC HIGH RPKM	NC LOW RPKM
127		1535	
18	109	984	551
		NSUN2	TUBAL3
		NUPB1	TUBB1
		NUDC	TUBB2A
		NUDT15	TUBB2B
		NUDT16	TUBB6
		NUDT6	TUBE1
		NUMA1	TUBG2
		NUP133	TUBGCP3
		NUP153	TUBGCP5
		NUP160	TXNL4B
		NUP188	UBD
		NUP205	UHRF1
		NUP210	USP2
		NUP214	USP3
		NUP37	USP37
		NUP43	USP44
		NUP50	USP51
		NUP54	VCIPI1
		NUP62	VRK1
		NUP85	WDHD1
		NUP88	WDR62
		NUP93	WDR76
		NUP98	WEE2
		NUPR1	WHAMM
		ODF2	WHAMMP3
		OIP5	WNT10B
		OPTN	WNT4
		ORC2	WNT9A
		ORC3	WRAP53
		ORC5	WRN
		OSGIN2	XRCC2
		PAF1	YAF2
		PAFAH1B1	YTHDC2
		PAK4	ZBTB49
		PARD3	ZFH3
		PAXIP1	ZFP36L2
		PBRM1	ZNF655
		PBX1	ZNF703
		PCID2	ZWILCH
		PCM1	
		PCNA	
		PCNP	
		PCNT	
		PDCD2L	
		PDCD4	
		PDCD6IP	
		PDSSA	
		PDSSB	
		PDXP	
		PEA15	
		PELO	
		PES1	
		PGGT1B	
		PHACTR4	
		PHB2	
		PHF13	
		PHF20	

Neurogenesis			
UP	DOWN	NC HIGH RPKM	NC LOW RPKM
81		1314	
41	40	630	684
		NCDN	LTA
		NCK1	LTK
		NCK2	LZTS1
		NCKAP1	MAG
		NCKIPSD	MAGI2
		NCOA1	MAP1A
		NCS1	MAP6
		NCSTN	MATN2
		NDE1	MCF2
		NDEL1	MDGA1
		NDRG1	MDGA2
		NEDD4L	MEF2A
		NF1	MEF2C
		NF2	MEIS1
		NFATC3	MET
		NFE2L1	MFS2D2A
		NFE2L2	MFS2D8
		NFIB	MKS1
		NGRN	MME
		NIF3L1	MM2P24
		NIN	MXN1
		NIPBL	MT3
		NME1	MTR
		NME2	MYB
		NOTCH2	MYO16
		NOTCH3	MYO7A
		NPTN	MYO9A
		NR2F2	MYPN
		NR2F6	NANOS1
		NRBP2	NAV1
		NRXN3	NAV2
		NSUN5	NAV3
		NUMB	NCAM1
		NUP133	NCKAP1L
		OPA1	NDRG4
		OPHN1	NEDD4
		P2RX4	NEFH
		PAC1IN1	NEGR1
		PAFAH1B1	NEK3
		PAK2	NEO1
		PAK4	NEUROD4
		PAK6	NEXN
		PALLD	NFASC
		PAQR3	NFAT5
		PARD3	NFATC1
		PBX1	NFATC2
		PBX2	NFATC4
		PBX3	NGEF
		PCM1	NGFR
		PDLM7	NKD1
		PEX13	NKX2-1
		PEX7	NKX2-2
		PHGDH	NKX2-5
		PICALM	NKX2-8
		PICK1	NKX6-1
		PIGT	NKX6-2
		PIK3CB	NLGN1

Steroid Receptor Signaling			
UP	DOWN	NC HIGH RPKM	NC LOW RPKM
27		301	
14	13	146	155
		GOT1	FOXH1
		GSTP1	FOXO1
		HDAC1	GHRHR
		HDAC6	GJB2
		HNRNPU	GNRH1
		IDH1	GPAM
		IGFBP2	GPR83
		KANK2	GRIP1
		KAT5	HNFA4
		KCTD6	HNFA4G
		KDM3A	HNMT
		KDM5D	HSD3B2
		KRAS	HTR1B
		LATS1	ICAM1
		LEF1	IGFBP7
		MDM2	ISL1
		MED1	JAK2
		NCOA1	LMO3
		NCOA2	LOX
		NCOA3	METTL21C
		NCOA4	MSTN
		NCOR1	MYOD1
		NCOR2	NEDD4
		NPC1	NKX2-2
		NR1D2	NODAL
		NR1H2	NOTCH1
		NR2C1	NPAS4
		NR2C2	NROB2
		NR2F2	NR1D1
		NR2F6	NR1H3
		NR3C2	NR1I2
		NRIP1	NR1I3
		PARK7	NR2E1
		PARP1	NR2E3
		PCNA	NR2F1
		PGRMC2	NR4A2
		PHB	NR4A3
		PHB2	NR5A1
		PIAS2	NR5A2
		PPARD	NR6A1
		PPP1R9B	NTRK3
		PPP5C	OR51E2
		PRMT2	OXT
		RAN	OXTR
		RARG	PADI2
		RB1	PAPPA
		RBBP7	PAQR7
		RBFOX2	PAQR8
		RELA	PCK1
		REST	PDCD7
		RHOA	PER1
		RNF14	PFKFB1
		RNF4	PGR
		RNF6	PIAS1
		RPS6KB1	POU4F2
		RWDD1	PPARA
		RXRA	PPARGC1A

Cell Cycle			
UP	DOWN	NC HIGH RPKM	NC LOW RPKM
127		1535	
18	109	984	551
		PHF23	
		PHF8	
		PHGDH	
		PHIP	
		PIAS4	
		PIM2	
		PIM3	
		PIN1	
		PKD2	
		PKIA	
		PKP4	
		PLD6	
		PLK2	
		PLRG1	
		PMF1	
		POC5	
		POGZ	
		POLA2	
		POLD2	
		POLD3	
		POLD4	
		POLDIP2	
		POLE	
		POLE3	
		POLE4	
		PPAT	
		PPM1A	
		PPM1G	
		PPME1	
		PPP1CA	
		PPP1CB	
		PPP1CC	
		PPP1R10	
		PPP1R12A	
		PPP1R12B	
		PPP1R13B	
		PPP1R15A	
		PPP1R9B	
		PPP2CA	
		PPP2CB	
		PPP2R1A	
		PPP2R1B	
		PPP2R2A	
		PPP2R2D	
		PPP2R5A	
		PPP2R5B	
		PPP2R5C	
		PPP2R5D	
		PPP2R5E	
		PPP5C	
		PPP6C	
		PRCC	
		PRIM2	
		PRKAA1	
		PRKAB1	
		PRKAB2	
		PRKACA	

Neurogenesis			
UP	DOWN	NC HIGH RPKM	NC LOW RPKM
81		1314	
41	40	630	684
		PIK3R1	NLGN3
		PIN1	NLGN4X
		PITPNA	NNAT
		PLAA	NOS1
		PLCG1	NOTCH1
		PLK2	NPHP4
		PLXNA1	NPTX1
		PLXNA3	NR1D1
		PLXNB1	NR2E1
		PLXNB2	NR2E3
		PPP1CC	NR2F1
		PPP1R9B	NR4A2
		PPP2R5B	NR4A3
		PPP3CB	NRAS
		PPP3R1	NRCAM
		PPT1	NRK
		PQBP1	NRL
		PRKCA	NRN1L
		PRKCH	NRP2
		PRKCI	NRTN
		PRKCZ	NRXN1
		PRKD1	NTF3
		PRMT1	NTF4
		PRMT5	NTN1
		PRPF19	NTN3
		PSAP	NTN5
		PSEN1	NTNG2
		PTCH1	NTRK2
		PTK2	NTRK3
		PTK2B	NUMBL
		PTK7	OLFM1
		PTPN11	OLIG1
		PTPN9	OLIG3
		PTPRF	OMG
		PTPRF	OMP
		PTPRK	ONECUT2
		PTPRM	OPALIN
		PTPRS	OPRM1
		RAB10	OSTN
		RAB11A	OTP
		RAB13	P2RY12
		RAB17	PARD6B
		RAB21	PAX2
		RAB35	PAX6
		RAB3A	PBX4
		RAB8A	PCDH12
		RAC1	PCP4
		RAC3	PCSK9
		RACGAP1	PDE6C
		RANBP9	PDZD7
		RAP1A	PER2
		RAPGEF1	PHACTR1
		RAPGEF2	PHOX2A
		RB1	PIK3CA
		RBFOX2	PIK3CD
		RBPJ	PITX2
		RDH13	PLA2G10

Steroid Receptor Signaling			
UP	DOWN	NC HIGH RPKM	NC LOW RPKM
27		301	
14	13	146	155
		RXRB	PPARGC1B
		SAFB	PTAFR
		SAFB2	PTGER2
		SDC1	PTN
		SIRT1	PTPRU
		SKP2	RAMP2
		SMARCA4	RARA
		SMYD3	RARB
		SRC	RORA
		SREBF1	RORB
		STRN3	RORC
		TADA3	RUNX1
		TAF7	SCGB2A1
		TfAP4	SCGB2A2
		TGFBR2	SERPINF1
		THRA	SLIT2
		TSPO	SLIT3
		TXNIP	SOX10
		UBA5	SOX30
		UBE2I	SPARC
		UBE2L3	SRD5A1
		UBE3A	SSTR2
		UBR5	SSTR5
		UFM1	STAR
		USP8	TFPI
		WBP2	TGFB1
		WNT7B	TGFB111
		YAP1	TGFB3
		YWHAH	TH
		ZBTB7A	TLR2
		ZFP36	TNF
		ZFP36L1	TP63
			TPH2
			TRIM63
			TRIM68
			TRIP4
			UCN
			UCP3
			UFSP2
			VDR
			ZFP36L2

Cell Cycle			
UP	DOWN	NC HIGH RPKM	NC LOW RPKM
127		1535	
18	109	984	551
		PRKACB	
		PRKAG1	
		PRKAR1A	
		PRKCA	
		PRKCD	
		PRKDC	
		PRMT1	
		PRMT2	
		PRMT5	
		PRNP	
		PRPF19	
		PRPF40A	
		PRR5	
		PSMA1	
		PSMA2	
		PSMA3	
		PSMA4	
		PSMA5	
		PSMA6	
		PSMA7	
		PSMB1	
		PSMB2	
		PSMB3	
		PSMB4	
		PSMB5	
		PSMB6	
		PSMB7	
		PSMC2	
		PSMC3	
		PSMC4	
		PSMC5	
		PSMD1	
		PSMD10	
		PSMD11	
		PSMD12	
		PSMD13	
		PSMD14	
		PSMD2	
		PSMD3	
		PSMD4	
		PSMD5	
		PSMD6	
		PSMD7	
		PSMD8	
		PSMD9	
		PSME1	
		PSME3	
		PSME4	
		PSMF1	
		PSMG2	
		PTCH1	
		PTP4A1	
		PTPN11	
		PTPN3	
		PTPN6	
		PTPRK	
		PTTG2	

Neurogenesis			
UP	DOWN	NC HIGH RPKM	NC LOW RPKM
81		1314	
41	40	630	684
		RELA	PLA2G3
		RERE	PLAG1
		REST	PLK5
		RGS3	PLXNA2
		RHOA	PLXNA4
		RHOD	PLXNB3
		RHOG	PLXNC1
		RHOH	PLXND1
		RNF10	PMP22
		RNF6	POU3F1
		ROCK1	POU3F2
		ROGDI	POU4F1
		RRN3	POU4F2
		RTN4	POU4F3
		RYK	PPP1R9A
		SCARB2	PPP3CC
		SCRIB	PPP3R2
		SCYL1	PRDM1
		SDC2	PRDM12
		SDC4	PRDM13
		SEC24B	PRDM16
		SECISBP2	PRDM6
		SEMA3B	PRDM8
		SEMA3F	PREX1
		SEMA4A	PREX2
		SEMA4B	PRKG1
		SEMA4C	PRRX1
		SEMA4D	PRX
		SEMA6A	PSD
		SERPINE2	PSPN
		SETX	PTEN
		SGK1	PTN
		SH3KBP1	PTPRD
		SH3RF1	PTPRG
		SHC1	PTPRO
		SIAH1	PTPRZ1
		SIN3A	RAC2
		SIPA1L1	RAP1GAP2
		SIRT2	RAPH1
		SIX1	RARA
		SKI	RARB
		SKIL	RASA1
		SLC11A2	RASAL1
		SLC25A46	RASGRF1
		SLC44A4	RASSF10
		SLC4A7	RELN
		SLC9A3R1	RET
		SLIT1	RGMA
		SMAD4	RG514
		SMARCE1	RHEB
		SMO	RIMS1
		SMURF1	RIMS2
		SNAPIN	RND1
		SNPH	RND2
		SNW1	RNF112
		SNX3	RNF157
		SOD1	RNF165

Cell Cycle			
UP	DOWN	NC HIGH RPKM	NC LOW RPKM
127		1535	
18	109	984	551
		PUM1	
		RAB11A	
		RAB11FIP3	
		RAB11FIP4	
		RAB1A	
		RAB1B	
		RAB2A	
		RAB35	
		RAB8A	
		RABGAP1	
		RACGAP1	
		RAD1	
		RAD17	
		RAD21	
		RAD23A	
		RAD50	
		RAD54B	
		RAD9A	
		RAE1	
		RALA	
		RALB	
		RAN	
		RANBP1	
		RANBP2	
		RANGAP1	
		RASSF1	
		RASSF2	
		RB1	
		RB1CC1	
		RBBP4	
		RBBP7	
		RBBP8	
		RBL2	
		RBM14	
		RBM38	
		RBX1	
		RCBTB1	
		RCC1	
		RCC2	
		RDX	
		RECQL5	
		REEP3	
		REEP4	
		RFC1	
		RFC2	
		RFC4	
		RFC5	
		RHOA	
		RHOB	
		RHOC	
		RHOU	
		RING1	
		RINT1	
		RIOK2	
		RIPK1	
		RMI1	
		RNF167	

Neurogenesis			
UP	DOWN	NC HIGH RPKM	NC LOW RPKM
81		1314	
41	40	630	684
		SORL1	ROBO2
		SOX4	ROBO3
		SPAG9	ROBO4
		SPEN	ROCK2
		SPG11	ROM1
		SPINT1	ROR1
		SPOCK1	ROR2
		SPTAN1	RORA
		SPTBN1	RORB
		SPTBN2	RP1L1
		SRC	RPE65
		SRF	RPGRIP1
		SRGAP2	RPGRIP1L
		SRRT	RPS6KA5
		SS18L1	RSP02
		SS18L2	RTN4IP1
		STAT3	RTN4R
		STK11	RTN4RL1
		STK24	RTN4RL2
		STK25	RUFY3
		STRN	RUNX1
		STX3	RUNX2
		STXBP1	S1PR5
		STYXL1	SAMD14
		SUFU	SARM1
		SUN1	SATB2
		SUN2	SCARF1
		SUZ12	SCLT1
		SYNE2	SCN1B
		SYT17	SCRT1
		SZT2	SCYL3
		TANC2	SDCCAG8
		TAOK1	SDK1
		TAOK2	SDK2
		TBC1D24	SEMA3A
		TBCD	SEMA3C
		TCF12	SEMA3D
		TCF3	SEMA3E
		TCTN1	SEMA3G
		TDP2	SEMA4F
		TEAD3	SEMA4G
		THOC2	SEMA5B
		TIMP2	SEMA6B
		TMEM106B	SEMA6C
		TMEM30A	SEMA6D
		TMEM98	SEMA7A
		TNFRSF12A	SERPINF1
		TOP2B	SEZ6
		TOPORS	SFRP2
		TOR1A	SH3GL2
		TPPP	SH3GL3
		TPRN	SH3TC2
		TRAK1	SHANK2
		TRAK2	SHANK3
		TRAPPC4	SHC3
		TRAPPC9	SHOX2
		TRIM11	SIX3

Cell Cycle			
UP	DOWN	NC HIGH RPKM	NC LOW RPKM
127		1535	
18	109	984	551
		RNF168	
		RNF4	
		RNF8	
		ROCK1	
		RPA2	
		RPL23	
		RPL24	
		RPL26	
		RPRD1B	
		RPS15A	
		RPS27A	
		RPS3	
		RPS6	
		RPS6KA1	
		RPS6KA2	
		RPS6KA3	
		RPS6KB1	
		RPTOR	
		RRAGA	
		RRAGB	
		RRAGC	
		RRAGD	
		RRM1	
		RRP8	
		RRS1	
		RSF1	
		RSPH1	
		RTKN	
		RUVBL1	
		RUVBL2	
		RYBP	
		SAC3D1	
		SBDS	
		SCRIB	
		SDCBP	
		SEC13	
		SEH1L	
		SENP2	
		SENP5	
		SENP6	
		SERTAD1	
		SET	
		SETD2	
		SETMAR	
		SFN	
		SFPQ	
		SGSM3	
		SH2B1	
		SIAH1	
		SIAH2	
		SIK1	
		SIN3A	
		SIRT1	
		SIRT2	
		SIRT7	
		SKIL	
		SKP1	

Neurogenesis			
UP	DOWN	NC HIGH RPKM	NC LOW RPKM
81		1314	
41	40	630	684
		TRIM32	SIX4
		TRIO	SLC12A5
		TRIOBP	SLC1A3
		TRIP11	SLC4A10
		TSC1	SLC6A4
		TSKU	SLC8A3
		TSPO	SLC9A6
		TTL	SLIT1
		TUBB3	SLIT2
		TUG1	SLIT3
		TULP3	SLITRK3
		TWF1	SLITRK4
		TWF2	SLITRK5
		UBA6	SLITRK6
		UBB	SMARCD3
		UBE3A	SNAP25
		UBE4B	SOS1
		UHMK1	SOX10
		ULK1	SOX11
		UNK	SOX6
		UQCRQ	SOX8
		USP21	SPAST
		USP33	SPINK5
		USP9X	SPTB
		UST	SPTBN4
		VANGL2	SPTBN5
		VAPA	SRCIN1
		VASP	SRGAP1
		VAX2	STAP1
		VCL	STAR
		VEGFA	STMN2
		WASF3	STMN3
		WASL	STMN4
		WDR1	STX1B
		WDR5	SYN1
		WEE1	SYNGAP1
		WNK1	SYT2
		WNT11	SYT4
		WNT5A	TAL1
		WNT5B	TBC1D23
		WNT7B	TBR1
		XBP1	TBX20
		XRCC5	TBX6
		XRN2	TCF4
		YAP1	TERT
		YTHDF1	TGFB1
		YTHDF2	TH
		YWHAE	TIAM1
		YWHAG	TIAM2
		YWHAH	TLR2
		YWHAZ	TLR4
		ZC4H2	TLX2
		ZFYVE27	TMC1
		ZHX2	TMEFF1
		ZMIZ1	TMEM108
		ZMYND8	TMEM132E
		ZNF335	TNF

Cell Cycle			
UP	DOWN	NC HIGH RPKM	NC LOW RPKM
127		1535	
18	109	984	551
		SKP2	
		SLC16A1	
		SLC2A8	
		SLC9A3R1	
		SMAD3	
		SMARCA5	
		SMARCAD1	
		SMARCB1	
		SMC1A	
		SMC3	
		SMC4	
		SMC5	
		SND1	
		SNX18	
		SNX33	
		SNX9	
		SON	
		SOX15	
		SOX4	
		SPECC1L	
		SPIN1	
		SPIRE1	
		SPIRE2	
		SPTBN1	
		SRC	
		SRPK2	
		SRSF5	
		SSNA1	
		STAG2	
		STAG3L4	
		STAMBP	
		STAT3	
		STAT5B	
		STK11	
		STRADA	
		SUMO1	
		SUN1	
		SUN2	
		SUV39H1	
		SUV39H2	
		SUZ12	
		SVIL	
		SYCP2	
		SYF2	
		SYNE2	
		TACC1	
		TACC2	
		TADA3	
		TAF10	
		TAF2	
		TAF6	
		TAOK1	
		TAOK2	
		TARDBP	
		TBCD	
		TBRG1	
		TBRG4	

Neurogenesis			
UP	DOWN	NC HIGH RPKM	NC LOW RPKM
81		1314	
41	40	630	684
		ZNF609	TNFRSF1B
		ZSWIM4	TNIK
		ZSWIM6	TOX
			TP53
			TP73
			TREM2
			TRIM46
			TRIM67
			TRPC5
			TRPC6
			TRPM1
			TRPV4
			TTBK1
			TTC21B
			TTL1
			TUBB2A
			TUBB2B
			TULP1
			TWIST1
			UCHL1
			UCN
			ULK4
			UNC13A
			UNC5A
			UNC5C
			USH1G
			USH2A
			VASH2
			VAX1
			VEGFC
			VIM
			VTN
			WASF1
			WDPCP
			WDR36
			WDR62
			WNT1
			WNT10B
			WNT16
			WNT2B
			WNT3
			WNT3A
			WNT4
			WNT8B
			WNT9A
			WNT9B
			XK
			XRCC2
			ZDHHC15
			ZEB1
			ZEB2
			ZFHX2
			ZFHX3
			ZNF488
			ZNF536
			ZNF804A
			ZSWIM5

Cell Cycle			
UP	DOWN	NC HIGH RPKM	NC LOW RPKM
127		1535	
18	109	984	551
		TEN1	
		TERF2IP	
		TET2	
		TFAP4	
		TFDP1	
		THAP1	
		THOC1	
		TIMELESS	
		TIMP2	
		TINF2	
		TIPRL	
		TK1	
		TMEM14B	
		TMEM8B	
		TMOD3	
		TMPO	
		TNFAIP3	
		TNKS1BP1	
		TNPO1	
		TOM1L1	
		TOM1L2	
		TOP2B	
		TOP3A	
		TOPBP1	
		TP53BP1	
		TP53BP2	
		TP53I13	
		TP53INP1	
		TPD52L1	
		TPR	
		TPRA1	
		TREX1	
		TRIAF1	
		TRIM32	
		TRIM35	
		TRIM37	
		TRIOBP	
		TRNP1	
		TSC1	
		TSC2	
		TSG101	
		TSPYL2	
		TTC19	
		TTL	
		TTLL12	
		TUBA1B	
		TUBA1C	
		TUBA4A	
		TUBB	
		TUBB3	
		TUBD1	
		TUBG1	
		TUBGCP2	
		TUBGCP4	
		TUBGCP6	
		TUSC2	
		TXLNG	

Cell Cycle			
UP	DOWN	NC HIGH RPKM	NC LOW RPKM
127		1535	
18	109	984	551
		TXNIP	
		TXNL4A	
		UBA3	
		UBA52	
		UBB	
		UBC	
		UBE2B	
		UBE2E1	
		UBE2E2	
		UBE2I	
		UBE2L3	
		UBE2N	
		UBE2V2	
		UBR2	
		UBXN2B	
		UHMK1	
		UHRF2	
		UIMC1	
		UNC119	
		UPF1	
		URGCP	
		USO1	
		USP16	
		USP19	
		USP22	
		USP28	
		USP33	
		USP39	
		USP47	
		USP8	
		USP9X	
		UTP14C	
		UVRAG	
		UXT	
		VASH1	
		VCP	
		VPS4A	
		VPS4B	
		VRK2	
		WAC	
		WASL	
		WDR6	
		WEE1	
		WIZ	
		WNT5A	
		WRAP73	
		WTAP	
		XPC	
		XPO1	
		YEATS4	
		YTHDF2	
		YWHAB	
		YWHAE	
		YWHAG	
		YWHAH	
		YWHAQ	
		YWHAZ	

Cell Cycle			
UP	DOWN	NC HIGH RPKM	NC LOW RPKM
127		1535	
18	109	984	551
YY1AP1 ZBTB17 ZC3HC1 ZFP36L1 ZFYVE19 ZFYVE26 ZMPSTE24 ZMYND11 ZNF16 ZNF207 ZNF268 ZNF318 ZNF385A ZNF503 ZNF830 ZW10			

Table S2. Selected pathway categories of interest with numbers of differentially expressed genes in APDT-signature from PDX PCSD1 organoids.

Category	Fold Enrichment	P-value	Differential (# Genes)			NO CHANGE (% Genes)					Total # Genes with Reads
			UP	DOWN	Total	%	HIGH	LOW	Total	%	
Interferon Signaling	4.9	2.0E-08	0	18	18	22.8	40	21	61	77.2	79
Cell Cycle	1.7	1.5E-07	18	109	127	7.8	985	519	1,504	92.2	1,631
Circadian Clock	1.6	9.3E-02	7	8	15	7.2	113	79	192	92.8	207
Prostate Stem /Progenitor	2.6	1.1E-02	5	3	8	12.1	22	36	58	87.9	66
NEPC /Neurogenic	2.2	1.9E-03	6	14	20	10.0	85	95	180	90.0	200
Neurogenesis	1.3	3.3E-03	41	40	81	5.9	627	655	1,282	94.1	1,363
Axon Guidance	2.4	3.2E-02	12	1	13	11.1	50	54	104	89.9	117
Hormone Response	1.5	3.3E-02	16	13	29	7.0	149	236	385	93.0	414
Steroid Receptor Signaling	1.8	3.2E-02	14	13	27	8.4	146	148	294	91.6	321
ALL	1.0	na	269	518	787	4.6	7,581	8,63	1,621	95.4	17,004

References

1. Siegel, R. L.; Miller, K. D.; Fuchs, H. E.; Jemal, A., Cancer Statistics, 2021. *CA Cancer J Clin* **2021**, 71, (1), 7-33.
2. Ahlering, T.; Huynh, L. M.; Kaler, K. S.; Williams, S.; Osann, K.; Joseph, J.; Lee, D.; Davis, J. W.; Abaza, R.; Kaouk, J.; Patel, V.; Kim, I. Y.; Porter, J.; Hu, J. C., Unintended consequences of decreased PSA-based prostate cancer screening. *World J Urol* **2019**, 37, (3), 489-496.
3. Teo, M. Y.; Rathkopf, D. E.; Kantoff, P., Treatment of Advanced Prostate Cancer. *Annu Rev Med* **2019**, 70, 479-499.
4. Kim, T. J.; Lee, Y. H.; Koo, K. C., Current Status and Future Perspectives of Androgen Receptor Inhibition Therapy for Prostate Cancer: A Comprehensive Review. *Biomolecules* **2021**, 11, (4).
5. Labriola, M. K.; Atiq, S.; Hirshman, N.; Bitting, R. L., Management of men with metastatic castration-resistant prostate cancer following potent androgen receptor inhibition: a review of novel investigational therapies. *Prostate Cancer Prostatic Dis* **2021**, 24, (2), 301-309.
6. Lin, H.; Liu, Q.; Zeng, X.; Yu, W.; Xu, G., Pembrolizumab with or without enzalutamide in selected populations of men with previously untreated metastatic castration-resistant prostate cancer harbouring programmed cell death ligand-1 staining: a retrospective study. *BMC Cancer* **2021**, 21, (1), 399.

7. Sperger, J. M.; Enamekhoo, H.; McKay, R. R.; Stahlfeld, C. N.; Singh, A.; Chen, X. E.; Kwak, L.; Gilsdorf, C. S.; Wolfe, S. K.; Wei, X. X.; Silver, R.; Zhang, Z.; Morris, M. J.; Bubley, G.; Feng, F. Y.; Scher, H. I.; Rathkopf, D.; Dehm, S. M.; Choueiri, T. K.; Halabi, S.; Armstrong, A. J.; Wyatt, A. W.; Taplin, M. E.; Zhao, S. G.; Lang, J. M., Prospective Evaluation of Clinical Outcomes Using a Multiplex Liquid Biopsy Targeting Diverse Resistance Mechanisms in Metastatic Prostate Cancer. *J Clin Oncol* **2021**, JCO2100169.
8. Jillson, L. K.; Rider, L. C.; Rodrigues, L. U.; Romero, L.; Karimpour-Fard, A.; Nieto, C.; Gillette, C.; Torkko, K.; Danis, E.; Smith, E. E.; Nolley, R.; Peehl, D. M.; Lucia, M. S.; Costello, J. C.; Cramer, S. D., Loss Drives Enhanced Androgen Signaling and Independently Confers Risk of Recurrence in Prostate Cancer with Joint Loss of. *Mol Cancer Res* **2021**, 19, (7), 1123-1136.
9. Oster, G.; Lamerato, L.; Glass, A. G.; Richert-Boe, K. E.; Lopez, A.; Chung, K.; Richhariya, A.; Dodge, T.; Wolff, G. G.; Balakumaran, A.; Edelsberg, J., Natural history of skeletal-related events in patients with breast, lung, or prostate cancer and metastases to bone: a 15-year study in two large US health systems. *Support Care Cancer* **2013**, 21, (12), 3279-86.
10. Logothetis, C.; Morris, M. J.; Den, R.; Coleman, R. E., Current perspectives on bone metastases in castrate-resistant prostate cancer. *Cancer Metastasis Rev* **2018**, 37, (1), 189-196.
11. Garnero, P.; Buchs, N.; Zekri, J.; Rizzoli, R.; Coleman, R. E.; Delmas, P. D., Markers of bone turnover for the management of patients with bone metastases from prostate cancer. *Br J Cancer* **2000**, 82, (4), 858-64.
12. Berchuck, J. E.; Viscuse, P. V.; Beltran, H.; Aparicio, A., Clinical considerations for the management of androgen indifferent prostate cancer. *Prostate Cancer Prostatic Dis* **2021**.
13. Crona, D. J.; Whang, Y. E., Androgen Receptor-Dependent and -Independent Mechanisms Involved in Prostate Cancer Therapy Resistance. *Cancers (Basel)* **2017**, 9, (6).
14. Coleman, R. E.; Croucher, P. I.; Padhani, A. R.; Clézardin, P.; Chow, E.; Fallon, M.; Guise, T.; Colangeli, S.; Capanna, R.; Costa, L., Bone metastases. *Nat Rev Dis Primers* **2020**, 6, (1), 83.
15. Hussain, A.; Tripathi, A.; Pieczonka, C.; Cope, D.; McNatty, A.; Logothetis, C.; Guise, T., Bone health effects of androgen-deprivation therapy and androgen receptor inhibitors in patients with nonmetastatic castration-resistant prostate cancer. *Prostate Cancer Prostatic Dis* **2020**.
16. Brady, L.; Kriner, M.; Coleman, I.; Morrissey, C.; Roudier, M.; True, L. D.; Gulati, R.; Plymate, S. R.; Zhou, Z.; Birditt, B.; Meredith, R.; Geiss, G.; Hoang, M.; Beechem, J.; Nelson, P. S., Inter- and intra-tumor heterogeneity of metastatic prostate cancer determined by digital spatial gene expression profiling. *Nat Commun* **2021**, 12, (1), 1426.
17. Sobel, R. E.; Sadar, M. D., Cell lines used in prostate cancer research: a compendium of old and new lines--part 1. *J Urol* **2005**, 173, (2), 342-59.
18. Namekawa, T.; Ikeda, K.; Horie-Inoue, K.; Inoue, S., Application of Prostate Cancer Models for Preclinical Study: Advantages and Limitations of Cell Lines, Patient-Derived Xenografts, and Three-Dimensional Culture of Patient-Derived Cells. *Cells* **2019**, 8, (1).
19. Raheem, O.; Kulidjian, A. A.; Wu, C.; Jeong, Y. B.; Yamaguchi, T.; Smith, K. M.; Goff, D.; Leu, H.; Morris, S. R.; Cacalano, N. A.; Masuda, K.; Jamieson, C. H.; Kane, C. J.; Jamieson, C. A., A novel patient-derived intra-femoral xenograft model of bone metastatic prostate cancer that recapitulates mixed osteolytic and osteoblastic lesions. *J Transl Med* **2011**, 9, 185.
20. Godebu, E.; Muldong, M.; Strasner, A.; Wu, C. N.; Park, S. C.; Woo, J. R.; Ma, W.; Liss, M. A.; Hirata, T.; Raheem, O.; Cacalano, N. A.; Kulidjian, A. A.; Jamieson, C. A., PCSD1, a new patient-derived model of bone metastatic prostate cancer, is castrate-resistant in the bone-niche. *J Transl Med* **2014**, 12, 275.
21. Nguyen, H. M.; Vessella, R. L.; Morrissey, C.; Brown, L. G.; Coleman, I. M.; Higano, C. S.; Mostaghel, E. A.; Zhang, X.; True, L. D.; Lam, H. M.; Roudier, M.; Lange, P. H.; Nelson, P. S.; Corey, E., LuCaP Prostate Cancer Patient-Derived Xenografts Reflect the Molecular Heterogeneity of Advanced Disease and Serve as Models for Evaluating Cancer Therapeutics. *Prostate* **2017**, 77, (6), 654-671.
22. Navone, N. M.; van Weerden, W. M.; Vessella, R. L.; Williams, E. D.; Wang, Y.; Isaacs, J. T.; Nguyen, H. M.; Culig, Z.; van der Pluijm, G.; Rentsch, C. A.; Marques, R. B.; de Ridder, C. M. A.; Bubendorf, L.; Thalmann, G. N.; Brennen, W. N.; Santer, F. R.; Moser, P. L.; Shepherd, P.; Efsthathiou, E.; Xue, H.; Lin, D.; Buijs, J.; Bosse, T.; Collins, A.; Maitland, N.; Buzza, M.; Kouspou, M.; Achtman, A.; Taylor, R. A.; Risbridger, G.; Corey, E., Movember GAP1 PDX project: An international collection of serially transplantable prostate cancer patient-derived xenograft (PDX) models. *Prostate* **2018**, 78, (16), 1262-1282.
23. Klein, K. A.; Reiter, R. E.; Redula, J.; Moradi, H.; Zhu, X. L.; Brothman, A. R.; Lamb, D. J.; Marcelli, M.; Belldgrun, A.; Witte, O. N.; Sawyers, C. L., Progression of metastatic human prostate cancer to androgen independence in immunodeficient SCID mice. *Nat Med* **1997**, 3, (4), 402-8.
24. Corey, E.; Quinn, J. E.; Vessella, R. L., A novel method of generating prostate cancer metastases from orthotopic implants. *Prostate* **2003**, 56, (2), 110-4.
25. Karthaus, W. R.; Iaquinta, P. J.; Drost, J.; Gracanin, A.; van Boxtel, R.; Wongvipat, J.; Dowling, C. M.; Gao, D.; Begthel, H.; Sachs, N.; Vries, R. G. J.; Cuppen, E.; Chen, Y.; Sawyers, C. L.; Clevers, H. C., Identification of multipotent luminal progenitor cells in human prostate organoid cultures. *Cell* **2014**, 159, (1), 163-175.
26. Drost, J.; Karthaus, W. R.; Gao, D.; Driehuis, E.; Sawyers, C. L.; Chen, Y.; Clevers, H., Organoid culture systems for prostate epithelial and cancer tissue. *Nat Protoc* **2016**, 11, (2), 347-58.
27. van de Wetering, M.; Francies, H. E.; Francis, J. M.; Bounova, G.; Iorio, F.; Pronk, A.; van Houdt, W.; van Gorp, J.; Taylor-Weiner, A.; Kester, L.; McLaren-Douglas, A.; Blokker, J.; Jaksani, S.; Bartfeld, S.; Volckman, R.; van Sluis, P.; Li, V. S.; Seepo, S.; Sekhar Pedamallu, C.; Cibulskis, K.; Carter, S. L.; McKenna, A.; Lawrence, M. S.; Lichtenstein, L.; Stewart, C.; Koster, J.; Versteeg, R.; van Oudenaarden, A.; Saez-Rodriguez, J.; Vries, R. G.; Getz, G.; Wessels, L.; Stratton, M. R.; McDermott, U.; Meyerson, M.

- Garnett, M. J.; Clevers, H., Prospective derivation of a living organoid biobank of colorectal cancer patients. *Cell* **2015**, *161*, (4), 933-45.
28. Chua, C. W.; Shibata, M.; Lei, M.; Toivanen, R.; Barlow, L. J.; Bergren, S. K.; Badani, K. K.; McKiernan, J. M.; Benson, M. C.; Hibshoosh, H.; Shen, M. M., Single luminal epithelial progenitors can generate prostate organoids in culture. *Nat Cell Biol* **2014**, *16*, (10), 951-61, 1-4.
 29. Agarwal, S.; Hynes, P. G.; Tillman, H. S.; Lake, R.; Abou-Kheir, W. G.; Fang, L.; Casey, O. M.; Ameri, A. H.; Martin, P. L.; Yin, J. J.; Iaquinta, P. J.; Karthaus, W. R.; Clevers, H. C.; Sawyers, C. L.; Kelly, K., Identification of Different Classes of Luminal Progenitor Cells within Prostate Tumors. *Cell Rep* **2015**, *13*, (10), 2147-58.
 30. Gao, D.; Vela, I.; Sboner, A.; Iaquinta, P. J.; Karthaus, W. R.; Gopalan, A.; Dowling, C.; Wanjala, J. N.; Undvall, E. A.; Arora, V. K.; Wongvipat, J.; Kossai, M.; Ramazanoglu, S.; Barboza, L. P.; Di, W.; Cao, Z.; Zhang, Q. F.; Sirotta, I.; Ran, L.; MacDonald, T. Y.; Beltran, H.; Mosquera, J. M.; Touijer, K. A.; Scardino, P. T.; Laudone, V. P.; Curtis, K. R.; Rathkopf, D. E.; Morris, M. J.; Danila, D. C.; Slovin, S. F.; Solomon, S. B.; Eastham, J. A.; Chi, P.; Carver, B.; Rubin, M. A.; Scher, H. I.; Clevers, H.; Sawyers, C. L.; Chen, Y., Organoid cultures derived from patients with advanced prostate cancer. *Cell* **2014**, *159*, (1), 176-187.
 31. Puca, L.; Bareja, R.; Prandi, D.; Shaw, R.; Benelli, M.; Karthaus, W. R.; Hess, J.; Sigouros, M.; Donoghue, A.; Kossai, M.; Gao, D.; Cyrta, J.; Sailer, V.; Vosoughi, A.; Pauli, C.; Churakova, Y.; Cheung, C.; Deonaraine, L. D.; McNary, T. J.; Rosati, R.; Tagawa, S. T.; Nanus, D. M.; Mosquera, J. M.; Sawyers, C. L.; Chen, Y.; Inghirami, G.; Rao, R. A.; Grandori, C.; Elemento, O.; Sboner, A.; Demichelis, F.; Rubin, M. A.; Beltran, H., Patient derived organoids to model rare prostate cancer phenotypes. *Nat Commun* **2018**, *9*, (1), 2404.
 32. Beshiri, M. L.; Tice, C. M.; Tran, C.; Nguyen, H. M.; Sowalsky, A. G.; Agarwal, S.; Jansson, K. H.; Yang, Q.; McGowen, K. M.; Yin, J.; Alilil, A. N.; Karzai, F. H.; Dahut, W. L.; Corey, E.; Kelly, K., A PDX/Organoid Biobank of Advanced Prostate Cancers Captures Genomic and Phenotypic Heterogeneity for Disease Modeling and Therapeutic Screening. *Clin Cancer Res* **2018**, *24*, (17), 4332-4345.
 33. Neeb, A.; Herranz, N.; Arce-Gallego, S.; Miranda, S.; Buroni, L.; Yuan, W.; Athie, A.; Casals, T.; Carmichael, J.; Rodrigues, D. N.; Gurel, B.; Rescigno, P.; Rekowski, J.; Welti, J.; Riisnaes, R.; Gil, V.; Ning, J.; Wagner, V.; Casanova-Salas, I.; Cordoba, S.; Castro, N.; Fenor de la Maza, M. D.; Seed, G.; Chandran, K.; Ferreira, A.; Figueiredo, I.; Bertan, C.; Bianchini, D.; Aversa, C.; Paschalis, A.; Gonzalez, M.; Morales-Barrera, R.; Suarez, C.; Carles, J.; Swain, A.; Sharp, A.; Gil, J.; Serra, V.; Lord, C.; Carreira, S.; Mateo, J.; de Bono, J. S., Advanced Prostate Cancer with ATM Loss: PARP and ATR Inhibitors. *Eur Urol* **2021**, *79*, (2), 200-211.
 34. Moutal, A.; Martin, L. F.; Boinon, L.; Gomez, K.; Ran, D.; Zhou, Y.; Stratton, H. J.; Cai, S.; Luo, S.; Gonzalez, K. B.; Perez-Miller, S.; Patwardhan, A.; Ibrahim, M. M.; Khanna, R., SARS-CoV-2 Spike protein co-opts VEGF-A/Neuropilin-1 receptor signaling to induce analgesia. *Pain* **2020**.
 35. Ha, S.; Iqbal, N. J.; Mita, P.; Ruoff, R.; Gerald, W. L.; Lepor, H.; Taneja, S. S.; Lee, P.; Melamed, J.; Garabedian, M. J.; Logan, S. K., Phosphorylation of the androgen receptor by PIM1 in hormone refractory prostate cancer. *Oncogene* **2013**, *32*, (34), 3992-4000.
 36. Linn, D. E.; Yang, X.; Xie, Y.; Alfano, A.; Deshmukh, D.; Wang, X.; Shimelis, H.; Chen, H.; Li, W.; Xu, K.; Chen, M.; Qiu, Y., Differential regulation of androgen receptor by PIM-1 kinases via phosphorylation-dependent recruitment of distinct ubiquitin E3 ligases. *J Biol Chem* **2012**, *287*, (27), 22959-68.
 37. Markou, A.; Tzanikou, E.; Strati, A.; Zavridou, M.; Mastoraki, S.; Bournakis, E.; Lianidou, E., Is Overexpressed at a High Frequency in Circulating Tumor Cells from Metastatic Castration-Resistant Prostate Cancer Patients. *Cancers (Basel)* **2020**, *12*, (5).
 38. Tomura, M.; Sakaue-Sawano, A.; Mori, Y.; Takase-Utsugi, M.; Hata, A.; Ohtawa, K.; Kanagawa, O.; Miyawaki, A., Contrasting quiescent G0 phase with mitotic cell cycling in the mouse immune system. *PLoS One* **2013**, *8*, (9), e73801.
 39. Debnath, J.; Brugge, J. S., Modelling glandular epithelial cancers in three-dimensional cultures. *Nat Rev Cancer* **2005**, *5*, (9), 675-88.
 40. Lee, S.; Burner, D. N.; Mendoza, T. R.; Muldong, M. T.; Arreola, C.; Wu, C. N.; Cacalano, N. A.; Kulidjian, A. A.; Kane, C. J.; Jamieson, C. A. M., Establishment and Analysis of Three-Dimensional (3D) Organoids Derived from Patient Prostate Cancer Bone Metastasis Specimens and their Xenografts. *J Vis Exp* **2020**, (156).
 41. Pappas, K. J.; Choi, D.; Sawyers, C. L.; Karthaus, W. R., Prostate Organoid Cultures as Tools to Translate Genotypes and Mutational Profiles to Pharmacological Responses. *J Vis Exp* **2019**, (152).
 42. Crowell, P. D.; Giafagione, J. M.; Hashimoto, T.; Diaz, J. A.; Goldstein, A. S., Evaluating the Differentiation Capacity of Mouse Prostate Epithelial Cells Using Organoid Culture. *J Vis Exp* **2019**, (153).
 43. Hu, W. Y.; Hu, D. P.; Xie, L.; Birch, L. A.; Prins, G. S., Isolation of Stem-like Cells from 3-Dimensional Spheroid Cultures. *J Vis Exp* **2019**, (154).
 44. Fatehullah, A.; Tan, S. H.; Barker, N., Organoids as an in vitro model of human development and disease. *Nat Cell Biol* **2016**, *18*, (3), 246-54.
 45. van Leenders, G. J.; Gage, W. R.; Hicks, J. L.; van Balken, B.; Aalders, T. W.; Schalken, J. A.; De Marzo, A. M., Intermediate cells in human prostate epithelium are enriched in proliferative inflammatory atrophy. *Am J Pathol* **2003**, *162*, (5), 1529-37.
 46. Linxweiler, J.; Körbel, C.; Müller, A.; Hammer, M.; Veith, C.; Bohle, R. M.; Stöckle, M.; Junker, K.; Menger, M. D.; Saar, M., A novel mouse model of human prostate cancer to study intraprostatic tumor growth and the development of lymph node metastases. *Prostate* **2018**, *78*, (9), 664-675.
 47. Liu, X.; Grogan, T. R.; Hieronymus, H.; Hashimoto, T.; Mottahedeh, J.; Cheng, D.; Zhang, L.; Huang, K.; Stoyanova, T.; Park, J. W.; Shkhyan, R. O.; Nowroozizadeh, B.; Rettig, M. B.; Sawyers, C. L.; Elashoff, D.; Horvath, S.; Huang, J.; Witte, O. N.; Goldstein, A. S., Low CD38 Identifies Progenitor-like Inflammation-Associated Luminal Cells that Can Initiate Human Prostate Cancer and Predict Poor Outcome. *Cell Rep* **2016**, *17*, (10), 2596-2606.

48. Kröger, C.; Afeyan, A.; Mraz, J.; Eaton, E. N.; Reinhardt, F.; Khodor, Y. L.; Thiru, P.; Bieri, B.; Ye, X.; Burge, C. B.; Weinberg, R. A., Acquisition of a hybrid E/M state is essential for tumorigenicity of basal breast cancer cells. *Proc Natl Acad Sci U S A* **2019**, *116*, (15), 7353-7362.
49. Karthaus, W. R.; Hofree, M.; Choi, D.; Linton, E. L.; Turkekul, M.; Beijnoord, A.; Carver, B.; Gopalan, A.; Abida, W.; Laudone, V.; Biton, M.; Chaudhary, O.; Xu, T.; Masilionis, I.; Manova, K.; Mazutis, L.; Pe'er, D.; Regev, A.; Sawyers, C. L., Regenerative potential of prostate luminal cells revealed by single-cell analysis. *Science* **2020**, *368*, (6490), 497-505.
50. Lowrance, W. T.; Breau, R. H.; Chou, R.; Chapin, B. F.; Crispino, T.; Dreicer, R.; Jarrard, D. F.; Kibel, A. S.; Morgan, T. M.; Morgans, A. K.; Oh, W. K.; Resnick, M. J.; Zietman, A. L.; Cookson, M. S., Advanced Prostate Cancer: AUA/ASTRO/SUO Guideline PART I. *J Urol* **2021**, *205*, (1), 14-21.
51. Goff, D. J.; Court Recart, A.; Sadarangani, A.; Chun, H. J.; Barrett, C. L.; Krajewska, M.; Leu, H.; Low-Marchelli, J.; Ma, W.; Shih, A. Y.; Wei, J.; Zhai, D.; Geron, I.; Pu, M.; Bao, L.; Chuang, R.; Balaian, L.; Gotlib, J.; Minden, M.; Martinelli, G.; Rusert, J.; Dao, K. H.; Shazand, K.; Wentworth, P.; Smith, K. M.; Jamieson, C. A.; Morris, S. R.; Messer, K.; Goldstein, L. S.; Hudson, T. J.; Marra, M.; Frazer, K. A.; Pellicchia, M.; Reed, J. C.; Jamieson, C. H., A Pan-BCL2 inhibitor renders bone-marrow-resident human leukemia stem cells sensitive to tyrosine kinase inhibition. *Cell Stem Cell* **2013**, *12*, (3), 316-28.
52. Morrissey, C.; Vessella, R. L.; Lange, P. H.; Lam, H. M., The biology and clinical implications of prostate cancer dormancy and metastasis. *J Mol Med (Berl)* **2016**, *94*, (3), 259-65.
53. Wu, Y.; Schoenborn, J. R.; Morrissey, C.; Xia, J.; Larson, S.; Brown, L. G.; Qu, X.; Lange, P. H.; Nelson, P. S.; Vessella, R. L.; Fang, M., High-Resolution Genomic Profiling of Disseminated Tumor Cells in Prostate Cancer. *J Mol Diagn* **2016**, *18*, (1), 131-43.
54. Chéry, L.; Lam, H. M.; Coleman, I.; Lakely, B.; Coleman, R.; Larson, S.; Aguirre-Ghiso, J. A.; Xia, J.; Gulati, R.; Nelson, P. S.; Montgomery, B.; Lange, P.; Snyder, L. A.; Vessella, R. L.; Morrissey, C., Characterization of single disseminated prostate cancer cells reveals tumor cell heterogeneity and identifies dormancy associated pathways. *Oncotarget* **2014**, *5*, (20), 9939-51.
55. Dhimolea, E.; de Matos Simoes, R.; Kansara, D.; Al'Khafaji, A.; Bouyssou, J.; Weng, X.; Sharma, S.; Raja, J.; Awate, P.; Shirasaki, R.; Tang, H.; Glassner, B. J.; Liu, Z.; Gao, D.; Bryan, J.; Bender, S.; Roth, J.; Scheffer, M.; Jeselsohn, R.; Gray, N. S.; Georgakoudi, I.; Vazquez, F.; Tsherniak, A.; Chen, Y.; Welm, A.; Duy, C.; Melnick, A.; Bartholdy, B.; Brown, M.; Culhane, A. C.; Mitsiades, C. S., An Embryonic Diapause-like Adaptation with Suppressed Myc Activity Enables Tumor Treatment Persistence. *Cancer Cell* **2021**, *39*, (2), 240-256.e11.
56. Pineda, G.; Lennon, K. M.; Delos Santos, N. P.; Lambert-Fliszar, F.; Riso, G. L.; Lazzari, E.; Marra, M. A.; Morris, S.; Sakaue-Sawano, A.; Miyawaki, A.; Jamieson, C. H., Tracking of Normal and Malignant Progenitor Cell Cycle Transit in a Defined Niche. *Sci Rep* **2016**, *6*, 23885.
57. Vummidi Giridhar, P.; Williams, K.; VonHandorf, A. P.; Deford, P. L.; Kasper, S., Constant Degradation of the Androgen Receptor by MDM2 Conserves Prostate Cancer Stem Cell Integrity. *Cancer Res* **2019**, *79*, (6), 1124-1137.
58. Hoffmann, M.; Kleine-Weber, H.; Schroeder, S.; Krüger, N.; Herrler, T.; Erichsen, S.; Schiergens, T. S.; Herrler, G.; Wu, N. H.; Nitsche, A.; Müller, M. A.; Drosten, C.; Pöhlmann, S., SARS-CoV-2 Cell Entry Depends on ACE2 and TMPRSS2 and Is Blocked by a Clinically Proven Protease Inhibitor. *Cell* **2020**, *181*, (2), 271-280.e8.
59. Qiao, Y.; Wang, X. M.; Mannan, R.; Pitchaiya, S.; Zhang, Y.; Wotring, J. W.; Xiao, L.; Robinson, D. R.; Wu, Y. M.; Tien, J. C.; Cao, X.; Simko, S. A.; Apel, I. J.; Bawa, P.; Kregel, S.; Narayanan, S. P.; Raskind, G.; Ellison, S. J.; Parolia, A.; Zelenka-Wang, S.; McMurtry, L.; Su, F.; Wang, R.; Cheng, Y.; Delekta, A. D.; Mei, Z.; Pretto, C. D.; Wang, S.; Mehra, R.; Sexton, J. Z.; Chinnaiyan, A. M., Targeting transcriptional regulation of SARS-CoV-2 entry factors. *Proc Natl Acad Sci U S A* **2020**.
60. Moradi, F.; Enjezab, B.; Ghadiri-Anari, A., The role of androgens in COVID-19. *Diabetes Metab Syndr* **2020**, *14*, (6), 2003-2006.
61. Baratchian, M.; McManus, J. M.; Berk, M.; Nakamura, F.; Mukhopadhyay, S.; Xu, W.; Erzurum, S.; Drazba, J.; Peterson, J.; Klein, E. A.; Gaston, B.; Sharifi, N., Sex, androgens and regulation of pulmonary AR, TMPRSS2 and ACE2. *bioRxiv* **2020**.
62. Avanzato, V. A.; Matson, M. J.; Seifert, S. N.; Pryce, R.; Williamson, B. N.; Anzick, S. L.; Barbian, K.; Judson, S. D.; Fischer, E. R.; Martens, C.; Bowden, T. A.; de Wit, E.; Riedo, F. X.; Munster, V. J., Case Study: Prolonged Infectious SARS-CoV-2 Shedding from an Asymptomatic Immunocompromised Individual with Cancer. *Cell* **2020**, *183*, (7), 1901-1912.e9.
63. Montopoli, M.; Zumerle, S.; Vettor, R.; Rugge, M.; Zorzi, M.; Catapano, C. V.; Carbone, G. M.; Cavalli, A.; Pagano, F.; Ragazzi, E.; Prayer-Galetti, T.; Alimonti, A., Androgen-deprivation therapies for prostate cancer and risk of infection by SARS-CoV-2: a population-based study (N = 4532). *Ann Oncol* **2020**, *31*, (8), 1040-1045.
64. Bhowmick, N. A.; Oft, J.; Dorff, T.; Pal, S.; Agarwal, N.; Figlin, R. A.; Posadas, E. M.; Freedland, S. J.; Gong, J., COVID-19 and androgen-targeted therapy for prostate cancer patients. *Endocr Relat Cancer* **2020**, *27*, (9), R281-R292.
65. Ghazizadeh, Z.; Majd, H.; Richter, M.; Samuel, R.; Zekavat, S. M.; Asgharian, H.; Farahvashi, S.; Kalantari, A.; Ramirez, J.; Zhao, H.; Natarajan, P.; Goodarzi, H.; Fattahi, F., Androgen Regulates SARS-CoV-2 Receptor Levels and Is Associated with Severe COVID-19 Symptoms in Men. *bioRxiv* **2020**.
66. Han, Y.; Duan, X.; Yang, L.; Nilsson-Payant, B. E.; Wang, P.; Duan, F.; Tang, X.; Yaron, T. M.; Zhang, T.; Uhl, S.; Bram, Y.; Richardson, C.; Zhu, J.; Zhao, Z.; Redmond, D.; Houghton, S.; Nguyen, D. T.; Xu, D.; Wang, X.; Jessurun, J.; Borczuk, A.; Huang, Y.; Johnson, J. L.; Liu, Y.; Xiang, J.; Wang, H.; Cantley, L. C.; tenOever, B. R.; Ho, D. D.; Pan, F. C.; Evans, T.; Chen, H. J.; Schwartz, R. E.; Chen, S., Identification of SARS-CoV-2 inhibitors using lung and colonic organoids. *Nature* **2021**, *589*, (7841), 270-275.
67. Salahudeen, A. A.; Choi, S. S.; Rustagi, A.; Zhu, J.; van Unen, V.; de la O, S. M.; Flynn, R. A.; Margalef-Català, M.; Santos, A. J. M.; Ju, J.; Batish, A.; Usui, T.; Zheng, G. X. Y.; Edwards, C. E.; Wagar, L. E.; Luca, V.; Anchang, B.; Nagendran, M.; Nguyen, K.; Hart, D. J.; Terry, J. M.; Belgrader, P.; Ziraldo, S. B.; Mikkelsen, T. S.; Harbury, P. B.; Glenn, J. S.; Garcia, K. C.; Davis, M. M.; Baric, R. S.; Sabatti, C.; Amieva, M. R.; Blish, C. A.; Desai, T. J.; Kuo, C. J., Progenitor identification and SARS-CoV-2 infection in human distal lung organoids. *Nature* **2020**, *588*, (7839), 670-675.

68. Hirata, T.; Park, S. C.; Muldong, M. T.; Wu, C. N.; Yamaguchi, T.; Strasner, A.; Raheem, O.; Kumon, H.; Sah, R. L.; Cacalano, N. A.; Jamieson, C. H. M.; Kane, C. J.; Masuda, K.; Kulidjian, A. A.; Jamieson, C. A. M., Specific bone region localization of osteolytic versus osteoblastic lesions in a patient-derived xenograft model of bone metastatic prostate cancer. *Asian J Urol* **2016**, *3*, (4), 229-239.
69. Langmead, B.; Salzberg, S. L., Fast gapped-read alignment with Bowtie 2. *Nat Methods* **2012**, *9*, (4), 357-9.
70. Trapnell, C.; Roberts, A.; Goff, L.; Pertea, G.; Kim, D.; Kelley, D. R.; Pimentel, H.; Salzberg, S. L.; Rinn, J. L.; Pachter, L., Differential gene and transcript expression analysis of RNA-seq experiments with TopHat and Cufflinks. *Nat Protoc* **2012**, *7*, (3), 562-78.
71. Li, H.; Handsaker, B.; Wysoker, A.; Fennell, T.; Ruan, J.; Homer, N.; Marth, G.; Abecasis, G.; Durbin, R.; Subgroup, G. P. D. P., The Sequence Alignment/Map format and SAMtools. *Bioinformatics* **2009**, *25*, (16), 2078-9.
72. Subramanian, A.; Tamayo, P.; Mootha, V. K.; Mukherjee, S.; Ebert, B. L.; Gillette, M. A.; Paulovich, A.; Pomeroy, S. L.; Golub, T. R.; Lander, E. S.; Mesirov, J. P., Gene set enrichment analysis: a knowledge-based approach for interpreting genome-wide expression profiles. *Proc Natl Acad Sci U S A* **2005**, *102*, (43), 15545-50.
73. Hu, W. Y.; Hu, D. P.; Xie, L.; Li, Y.; Majumdar, S.; Nonn, L.; Hu, H.; Shioda, T.; Prins, G. S., Isolation and functional interrogation of adult human prostate epithelial stem cells at single cell resolution. *Stem Cell Res* **2017**, *23*, 1-12.
74. Moad, M.; Hannezo, E.; Buczacski, S. J.; Wilson, L.; El-Sherif, A.; Sims, D.; Pickard, R.; Wright, N. A.; Williamson, S. C.; Turnbull, D. M.; Taylor, R. W.; Greaves, L.; Robson, C. N.; Simons, B. D.; Heer, R., Multipotent Basal Stem Cells, Maintained in Localized Proximal Niches, Support Directed Long-Ranging Epithelial Flows in Human Prostates. *Cell Rep* **2017**, *20*, (7), 1609-1622.
75. Warriar, N. M.; Agarwal, P.; Kumar, P., Emerging Importance of Survivin in Stem Cells and Cancer: the Development of New Cancer Therapeutics. *Stem Cell Rev Rep* **2020**, *16*, (5), 828-852.
76. Adisetiyo, H.; Liang, M.; Liao, C. P.; Aycock-Williams, A.; Cohen, M. B.; Xu, S.; Neamati, N.; Conway, E. M.; Cheng, C. Y.; Nikitin, A. Y.; Roy-Burman, P., Loss of survivin in the prostate epithelium impedes carcinogenesis in a mouse model of prostate adenocarcinoma. *PLoS One* **2013**, *8*, (7), e69484.
77. Schroeder, A.; Herrmann, A.; Cherryholmes, G.; Kowolik, C.; Buettner, R.; Pal, S.; Yu, H.; Müller-Newen, G.; Jove, R., Loss of androgen receptor expression promotes a stem-like cell phenotype in prostate cancer through STAT3 signaling. *Cancer Res* **2014**, *74*, (4), 1227-37.
78. Sui, X.; Cai, J.; Li, H.; He, C.; Zhou, C.; Dong, Y.; Chen, L.; Zhang, B.; Wang, Y.; Zhang, Y.; Qiu, Y.; Zhao, Y.; Huang, Y.; Shen, Y.; Wu, H.; Xiao, J.; Mason, C.; Zhu, Q.; Han, S., p53-dependent CD51 expression contributes to characteristics of cancer stem cells in prostate cancer. *Cell Death Dis* **2018**, *9*, (5), 523.
79. Wang, L.; Li, Y.; Yang, X.; Yuan, H.; Li, X.; Qi, M.; Chang, Y. W.; Wang, C.; Fu, W.; Yang, M.; Zhang, J.; Han, B., ERG-SOX4 interaction promotes epithelial-mesenchymal transition in prostate cancer cells. *Prostate* **2014**, *74*, (6), 647-58.
80. Miao, L.; Yang, L.; Li, R.; Rodrigues, D. N.; Crespo, M.; Hsieh, J. T.; Tilley, W. D.; de Bono, J.; Selth, L. A.; Raj, G. V., Disrupting Androgen Receptor Signaling Induces Snail-Mediated Epithelial-Mesenchymal Plasticity in Prostate Cancer. *Cancer Res* **2017**, *77*, (11), 3101-3112.
81. Carafa, V.; Altucci, L.; Nebbioso, A., Dual Tumor Suppressor and Tumor Promoter Action of Sirtuins in Determining Malignant Phenotype. *Front Pharmacol* **2019**, *10*, 38.
82. Linn, D. E.; Yang, X.; Sun, F.; Xie, Y.; Chen, H.; Jiang, R.; Chumsri, S.; Burger, A. M.; Qiu, Y., A Role for OCT4 in Tumor Initiation of Drug-Resistant Prostate Cancer Cells. *Genes Cancer* **2010**, *1*, (9), 908-16.
83. Jeter, C. R.; Liu, B.; Liu, X.; Chen, X.; Liu, C.; Calhoun-Davis, T.; Repass, J.; Zaehres, H.; Shen, J. J.; Tang, D. G., NANOG promotes cancer stem cell characteristics and prostate cancer resistance to androgen deprivation. *Oncogene* **2011**, *30*, (36), 3833-45.
84. Koh, C. M.; Bieberich, C. J.; Dang, C. V.; Nelson, W. G.; Yegnasubramanian, S.; De Marzo, A. M., MYC and Prostate Cancer. *Genes Cancer* **2010**, *1*, (6), 617-28.
85. Bae, K. M.; Parker, N. N.; Dai, Y.; Vieweg, J.; Siemann, D. W., E-cadherin plasticity in prostate cancer stem cell invasion. *Am J Cancer Res* **2011**, *1*, (1), 71-84.
86. Putzke, A. P.; Ventura, A. P.; Bailey, A. M.; Akture, C.; Opoku-Ansah, J.; Celiktaş, M.; Hwang, M. S.; Darling, D. S.; Coleman, I. M.; Nelson, P. S.; Nguyen, H. M.; Corey, E.; Tewari, M.; Morrissey, C.; Vessella, R. L.; Knudsen, B. S., Metastatic progression of prostate cancer and e-cadherin regulation by zeb1 and SRC family kinases. *Am J Pathol* **2011**, *179*, (1), 400-10.
87. Lukacs, R. U.; Memarzadeh, S.; Wu, H.; Witte, O. N., Bmi-1 is a crucial regulator of prostate stem cell self-renewal and malignant transformation. *Cell Stem Cell* **2010**, *7*, (6), 682-93.
88. Schneider, J. A.; Logan, S. K., Revisiting the role of Wnt/ β -catenin signaling in prostate cancer. *Mol Cell Endocrinol* **2018**, *462*, (Pt A), 3-8.
89. Lee, E.; Madar, A.; David, G.; Garabedian, M. J.; Dasgupta, R.; Logan, S. K., Inhibition of androgen receptor and β -catenin activity in prostate cancer. *Proc Natl Acad Sci U S A* **2013**, *110*, (39), 15710-5.
90. Li, P.; Yang, R.; Gao, W. Q., Contributions of epithelial-mesenchymal transition and cancer stem cells to the development of castration resistance of prostate cancer. *Mol Cancer* **2014**, *13*, 55.