Supplementary Information

Biological determinants of bladder cancer gene expression subtypes

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Supplementary Figure Legends

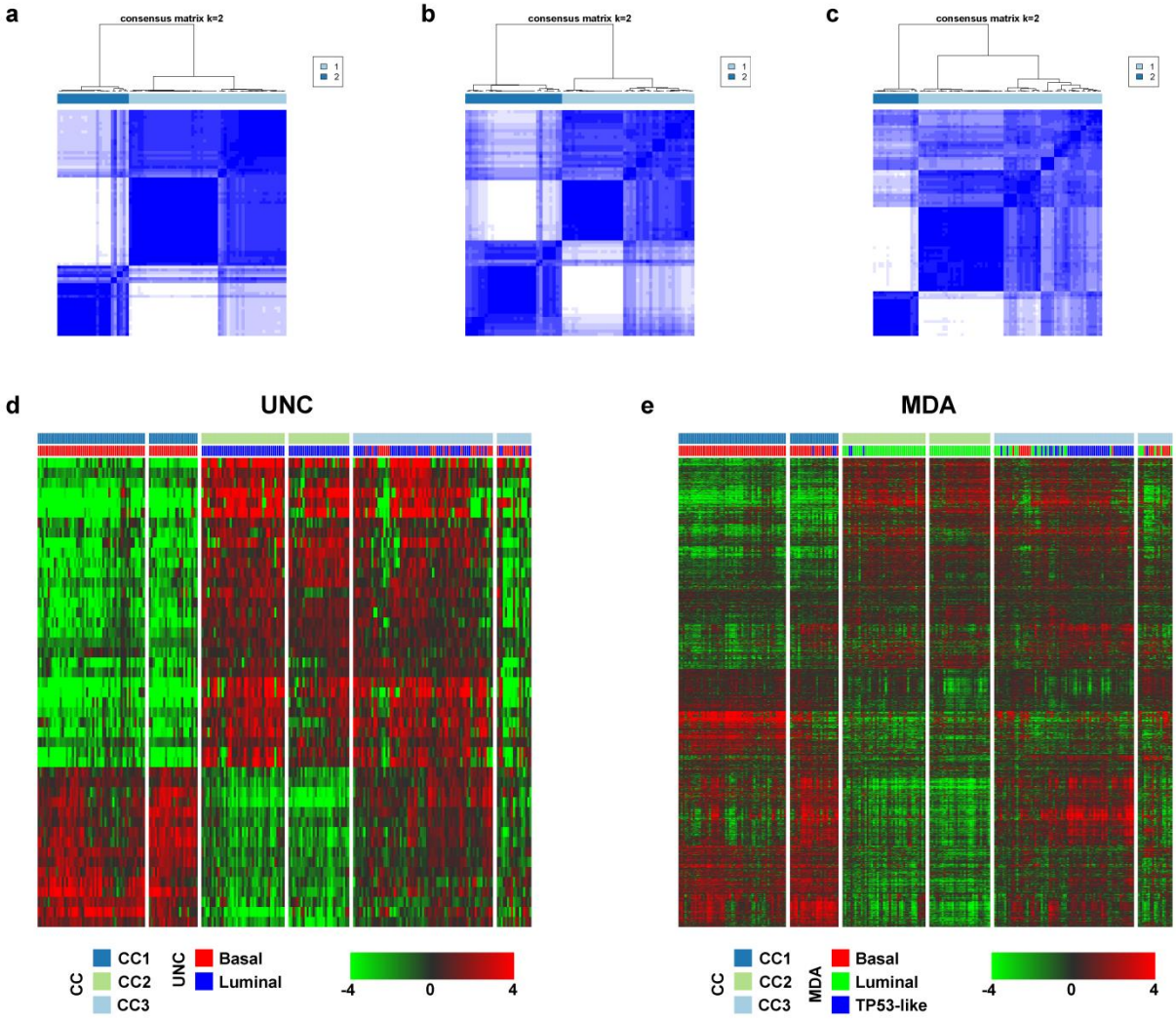
Supplementary Figure 1 | Substratifcation of the three main subgroups of tumors. (**a-c**) Heatmap visualization of sample coclustering frequencies for two-group splits of the CC1 (**a**), CC2 (**b**), and CC3 (**c**) subgroups generated using ConsensusClusterPlus in R. (**d-e**) Heatmap visualization of the UNC- (**d**) and MDA (**e**) classifier genes accross the six consensus subgroups.

Supplementary Figure 2 |CC1-2 subgroup tumors exhibit high VIM and variable CDH1 expression. Uncentered mRNA expression levels of the genes *VIM* (Vimentin) and *CDH1* (E-cadherin) accross the consensus cluster subgroups with Lund molecular subtype indicated **(a)**. Boxplots showing relative difference in mRNA exprssion between the CC1-2 and CC3-1 subgroups for genes related to EMT **(b)**, epithelial differentiation **(c)** and urothelial differentiation **(d)**.

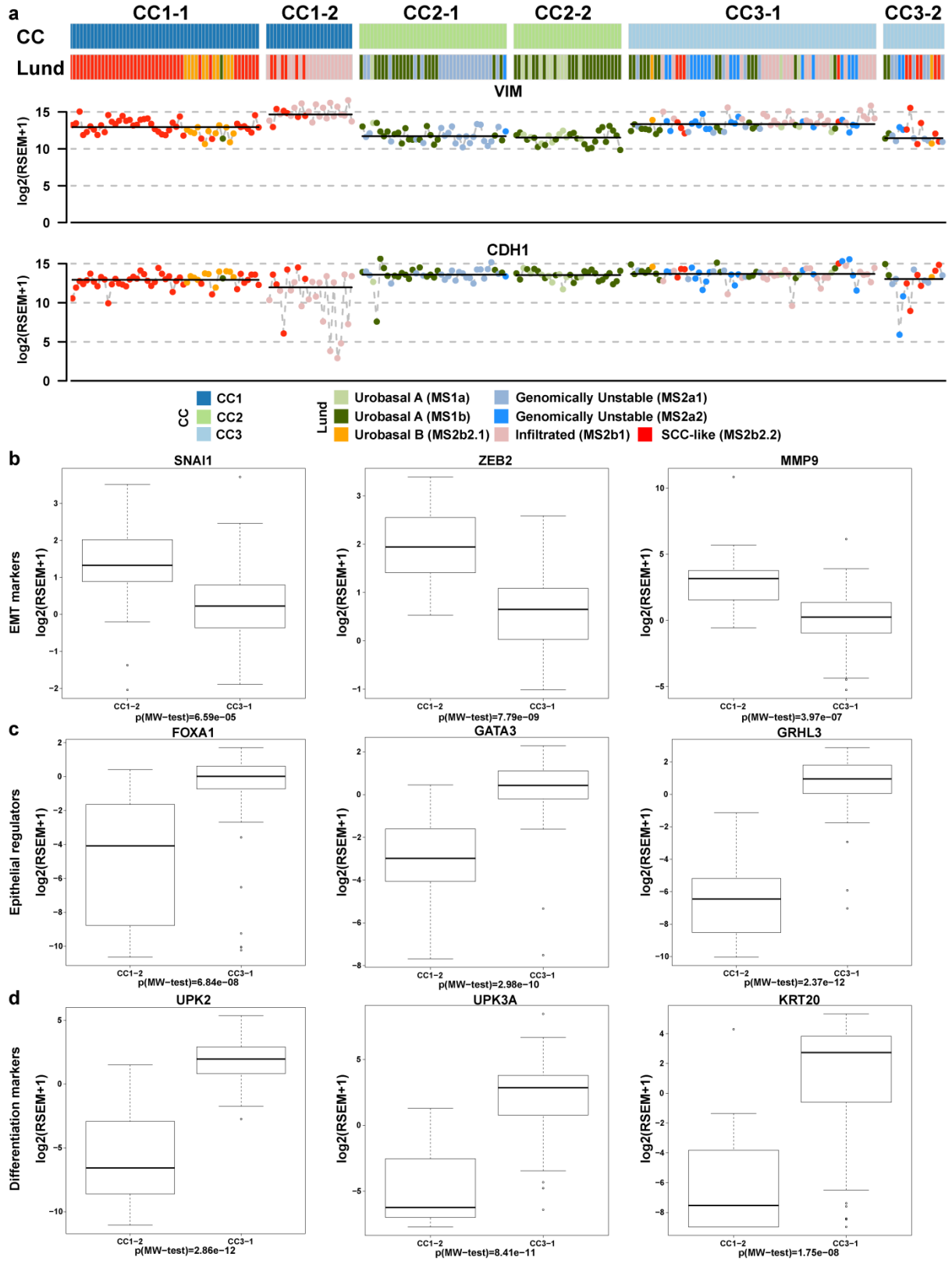
Supplementary Figure 3 | UC gene expression classifier calls accross TCGA tumor samples. TCGA samples were classified using UNC, MDA and Lund gene experssion centroids wiht Pearson correlation as the similarity metric. Final sample-level classifier calls and correlations to the respective centroids are shown in heatmap format for the three classification systems and consensus cluster subgroups.

Supplementary Figures

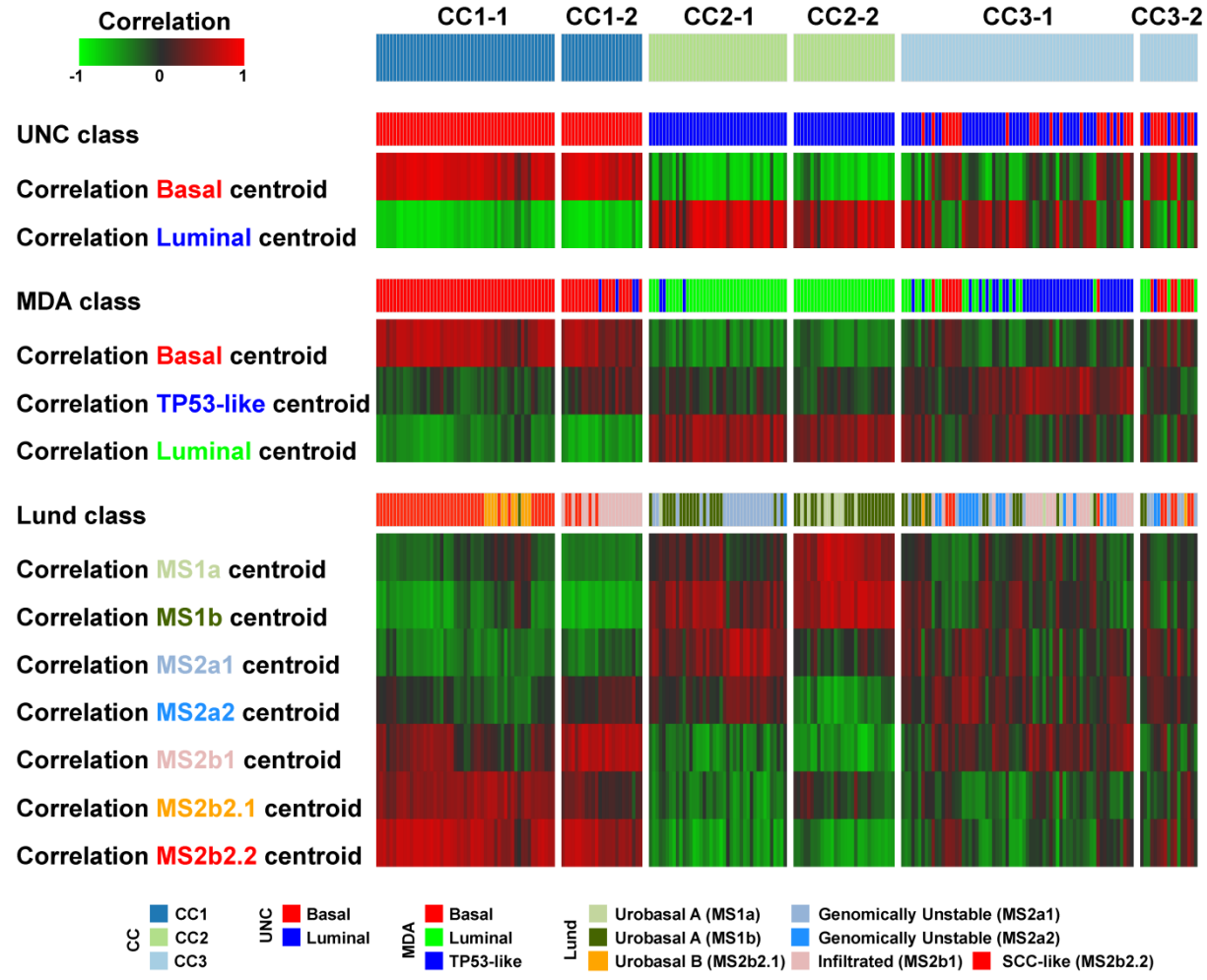
Supplementary Figure 1 - Höglund



Supplementary Figure 2 - Höglund



Supplementary Figure 3 - Höglund



Supplementary table 1
AmiGO analysis (amigo.geneontology.org/rte) output for differentially expressed genes between CC1 and CC2, table derived using PANTHER (go.pantherdb.org)

Significant GO-terms for CC1 upregulated- (N=2886) and downregulated (N=3233) genes, output truncated at p(boferroni)<0.05 or top 25 GO-terms

Analysis Type: PANTHER Overrepresentation Test (release 20141219)
Annotation Version and Release Date: GO Ontology database Released 2015-02-17
Reference List: Homo sapiens (all genes in database)
Bonferroni correction: TRUE

CC1 upregulated genes

GO biological process complete	Enrichment/Depletion	p(bonferroni)
immune system process	+	7.48E-117
biological_process	+	5.99E-105
single-organism process	+	1.32E-97
response to stimulus	+	5.31E-96
immune response	+	2.15E-93
single-organism cellular process	+	9.64E-92
defense response	+	1.95E-89
response to stress	+	1.14E-82
biological regulation	+	1.12E-75
regulation of immune system process	+	2.44E-73
regulation of response to stimulus	+	7.02E-73
positive regulation of biological process	+	5.98E-69
regulation of biological process	+	1.27E-65
positive regulation of response to stimulus	+	1.31E-61
cellular response to stimulus	+	2.14E-60
positive regulation of immune system process	+	1.71E-59
regulation of cellular process	+	3.37E-59
cellular process	+	4.65E-57
signal transduction	+	5.87E-57
single organism signaling	+	1.34E-56
signaling	+	1.34E-56
cell communication	+	4.22E-56
response to external stimulus	+	1.36E-55
positive regulation of cellular process	+	1.93E-51
biological adhesion	+	5.29E-51

CC1 downregulated genes

GO biological process complete	Enrichment/Depletion	p(bonferroni)
biological_process	+	2.11E-33
cellular process	+	2.83E-18
biological regulation	+	9.50E-15
transcription, DNA-templated	+	9.35E-12
nucleic acid-templated transcription	+	9.97E-12
lipid metabolic process	+	1.88E-11
regulation of biological process	+	1.49E-10
detection of chemical stimulus involved in sensory perception of smell	-	3.27E-10
regulation of transcription, DNA-templated	+	3.49E-10
regulation of nucleic acid-templated transcription	+	8.93E-10
regulation of cellular process	+	9.35E-10
translation	-	1.11E-09
regulation of RNA biosynthetic process	+	2.25E-09
biosynthetic process	+	2.29E-09
RNA biosynthetic process	+	3.37E-09
cellular lipid metabolic process	+	3.97E-09
regulation of RNA metabolic process	+	5.51E-09
organic substance biosynthetic process	+	5.55E-09
cellular macromolecule catabolic process	-	5.99E-09
small molecule metabolic process	+	2.16E-08
sensory perception of smell	-	2.38E-08
detection of chemical stimulus involved in sensory perception	-	2.49E-08
xenobiotic metabolic process	+	3.29E-08
cellular response to xenobiotic stimulus	+	4.15E-08
single-organism process	+	4.50E-08

Supplementary table 2
AmiGO analysis (amigo.geneontology.org/rte) output for genes upregulated in CC3-1 vs CC1-2, table derived using PANTHER (go.pantherdb.org)

Significant GO-terms for CC3-1 upregulated genes (N=1984), output truncated at p(boferroni)<0.05 or top 25 GO-terms

Analysis Type: PANTHER Overrepresentation Test (release 20141219)
Annotation Version and Release Date: GO Ontology database Released 2015-02-17
Reference List: Homo sapiens (all genes in database)
Bonferroni correction: TRUE

GO biological process complete	Enrichment/Depletion	p(bonferroni)
biological_process	+	4.95E-24
lipid metabolic process	+	5.86E-19
cellular lipid metabolic process	+	2.14E-14
cellular process	+	8.22E-11
organic hydroxy compound metabolic process	+	1.60E-09
small molecule metabolic process	+	1.56E-08
fatty acid metabolic process	+	1.70E-08
biosynthetic process	+	3.51E-08
lipid biosynthetic process	+	5.20E-08
carboxylic acid metabolic process	+	6.16E-08
single-organism process	+	1.46E-07
oxoacid metabolic process	+	1.66E-07
organic acid metabolic process	+	1.71E-07
organic substance biosynthetic process	+	1.87E-07
monocarboxylic acid metabolic process	+	1.94E-07
metabolic process	+	1.78E-06
epithelial cell differentiation	+	2.29E-06
organic acid catabolic process	+	3.57E-06
carboxylic acid catabolic process	+	3.57E-06
cellular biosynthetic process	+	4.66E-06
organic substance metabolic process	+	1.04E-05
biological regulation	+	1.11E-05
primary metabolic process	+	1.24E-05
small molecule catabolic process	+	1.36E-05
monocarboxylic acid catabolic process	+	1.42E-05

Supplementary table 3
AmiGO analysis (amigo.geneontology.org/rte) output for genes upregulated in CC3-2 vs rest, table derived using PANTHER (go.pantherdb.org)

Significant GO-terms for CC3-2 upregulated genes (N=289), output truncated at p(boferroni)<0.05 or top 25 GO-terms

Analysis Type: PANTHER Overrepresentation Test (release 20141219)
Annotation Version and Release Date: GO Ontology database Released 2015-02-17
Reference List: Homo sapiens (all genes in database)
Bonferroni correction: TRUE

GO biological process complete	Enrichment/Depletion	p(bonferroni)
cell cycle	+	6.50E-12
mitotic cell cycle	+	2.89E-10
mitotic cell cycle process	+	7.00E-09
cell cycle process	+	9.19E-08
single-organism process	+	1.95E-07
organelle fission	+	5.11E-07
cellular process	+	5.64E-07
biological_process	+	6.73E-07
nuclear division	+	8.19E-07
single-organism cellular process	+	5.10E-06
DNA metabolic process	+	1.31E-05
mitotic nuclear division	+	2.75E-05
organelle organization	+	6.73E-05
biological regulation	+	3.50E-04
single-organism organelle organization	+	3.73E-04
chromosome organization	+	6.32E-04
regulation of biological process	+	8.57E-04
cell division	+	9.95E-04
regulation of cellular process	+	1.03E-03
chromosome segregation	+	1.13E-03
nucleic acid metabolic process	+	1.27E-03
nucleobase-containing compound metabolic process	+	1.82E-03
cellular component organization	+	1.88E-03
anatomical structure development	+	3.17E-03
meiotic cell cycle	+	4.56E-03

Supplementary table 4
AmiGO analysis (amigo.geneontology.org/rte) output for genes upregulated in CC2-2 vs rest, table derived using PANTHER (go.pantherdb.org)

Significant GO-terms for CC2-2 upregulated- (N=511) and downregulated (N=1030) genes, output truncated at p(boferroni)<0.05 or top 25 GO-terms

Analysis Type: PANTHER Overrepresentation Test (release 20141219)
Annotation Version and Release Date: GO Ontology database Released 2015-02-17
Reference List: Homo sapiens (all genes in database)
Bonferroni correction: TRUE

CC2-2 upregulated genes

GO biological process complete	Enrichment/Depletion	p(bonferroni)
SRP-dependent cotranslational protein targeting to membrane	+	3.83E-29
cotranslational protein targeting to membrane	+	7.37E-29
protein targeting to ER	+	1.02E-28
establishment of protein localization to endoplasmic reticulum	+	3.59E-28
viral transcription	+	2.51E-27
nuclear-transcribed mRNA catabolic process, nonsense-mediated decay	+	1.13E-26
protein localization to endoplasmic reticulum	+	4.70E-26
viral gene expression	+	4.79E-26
translational termination	+	2.03E-25
multi-organism metabolic process	+	2.49E-25
cellular protein complex disassembly	+	5.02E-24
protein targeting to membrane	+	3.84E-23
translational elongation	+	5.38E-23
protein complex disassembly	+	1.55E-22
macromolecular complex disassembly	+	5.96E-22
nuclear-transcribed mRNA catabolic process	+	3.20E-21
RNA catabolic process	+	1.33E-20
viral life cycle	+	1.52E-20
mRNA catabolic process	+	1.97E-20
translational initiation	+	2.97E-20
establishment of protein localization to membrane	+	2.55E-19
aromatic compound catabolic process	+	5.64E-17
nucleobase-containing compound catabolic process	+	1.39E-16
organic cyclic compound catabolic process	+	2.16E-16
cellular nitrogen compound catabolic process	+	2.80E-16

CC2-2 downregulated genes

GO biological process complete	Enrichment/Depletion	p(bonferroni)
single-organism process	+	4.40E-43
biological_process	+	1.15E-40
single-organism cellular process	+	9.97E-40
mitotic cell cycle	+	4.73E-33
cellular process	+	1.05E-31
cell cycle	+	6.22E-31
cell cycle process	+	1.28E-27
mitotic cell cycle process	+	6.73E-27
biological phase	+	1.84E-26
mitotic cell cycle phase	+	4.84E-26
cell cycle phase	+	4.84E-26
nuclear division	+	4.01E-22
organelle fission	+	3.45E-21
biological regulation	+	6.92E-21
response to stress	+	1.22E-19
cellular component organization	+	2.23E-19
response to stimulus	+	1.32E-18
mitotic nuclear division	+	3.01E-18
cellular component organization or biogenesis	+	6.95E-18
cellular response to stimulus	+	7.54E-18
mitotic prometaphase	+	2.25E-17
regulation of cellular process	+	4.64E-17
regulation of biological process	+	7.67E-17
cell division	+	3.83E-16
positive regulation of biological process	+	9.45E-16

Supplementary table 5
Files downloaded through the TCGA public ftp-site available at "https://tcga-data.nci.nih.gov/tcgafiles/ftp_auth/distro_ftpusers/anonymous/tumor/blca/"

TCGA sample clusters file according to TCGA, Nature, Volume 507 Number 7492, 315-322, Mar. 20, 2014 [doi:10.1038]
BLCA_cluster-assign-k4.tsv

TCGA somatic variant annotation file
PR_TCGA_BLCA_PAIR_Capture_All_Pairs_QCPASS_v5.aggregated.capture.tcga.uuid.automated.somatic.maf

TCGA gene expression files
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AMAZE_p_TCGASNP_b86_87_88_N_GenomeWideSNP_6_C11_735468
FOXED_p_TCGA_b122_128_SNP_N_GenomeWideSNP_6_F11_781866
AMAZE_p_TCGASNP_b86_87_88_N_GenomeWideSNP_6_F05_735440
BISON_p_TCGA_164_173_175_SNP_N_GenomeWideSNP_6_F09_863298
WHIPS_p_1TCGA_220_235_N_GenomeWideSNP_6_F06_1230930
XYLEM_p_TCGASNP_207_212_N_GenomeWideSNP_6_E04_1051190
GLIAS_p_TCGA_204_205_206_207_N_GenomeWideSNP_6_E10_1051830
DLP_REDO_FROM_CONGA_B03
FRUIT_p_TCGAb_327_328_329_NSP_GenomeWideSNP_6_E06_1367852
SNOWS_p_TCGA_Batch_309_310_NSP_GenomeWideSNP_6_B12_1362068
CODON_p_TCGA_293_294_295_N_GenomeWideSNP_6_F05_1343540
COPAL_p_TCGAb_337_338_339_NSP_GenomeWideSNP_6_B06_1373642
GLIAS_p_TCGA_204_205_206_207_N_GenomeWideSNP_6_E01_1051786
ENDUE_p_TCGA_271_76_79_280_81_N_GenomeWideSNP_6_E05_1346908
SNOWS_p_TCGA_Batch_309_310_NSP_GenomeWideSNP_6_B06_1362010
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XYLEM_p_TCGASNP_207_212_N_GenomeWideSNP_6_B08_1051166
BISON_p_TCGA_164_173_175_SNP_N_GenomeWideSNP_6_C11_863354
COPAL_p_TCGAb_337_338_339_NSP_GenomeWideSNP_6_C12_1373596
SNOWS_p_TCGA_Batch_309_310_NSP_GenomeWideSNP_6_C09_1362008
LOLLS_p_TCGASNP_223_225_N_GenomeWideSNP_6_H04_1151988
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CODON_p_TCGA_293_294_295_N_GenomeWideSNP_6_D05_1343632
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HORNS_p_TCGA_b110_113_SNP_N_GenomeWideSNP_6_C04_772308

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WHIRR_p_TCGA_168_169_170_redo_N_GenomeWideSNP_6_A07_845096
AVISO_p_4TCGA_242_238_250_mN_GenomeWideSNP_6_A08_1231504
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COPAL_p_TCGAb_337_338_339_NSP_GenomeWideSNP_6_B02_1373644
FRUIT_p_TCGAb_327_328_329_NSP_GenomeWideSNP_6_E02_1367874
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WAXEN_p_TCGA_252_253_N_GenomeWideSNP_6_A07_1270578
TYPED_p_TCGA_188_192_Mirn_SNP_N_GenomeWideSNP_6_C12_913854
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AMAZE_p_TCGASNP_b86_87_88_N_GenomeWideSNP_6_E11_735426
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OKRAS_p_TCGA_198_199_200_SNP_N_GenomeWideSNP_6_F03_955462
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TYPED_p_TCGA_188_192_Mirn_SNP_N_GenomeWideSNP_6_C11_913922
OKRAS_p_TCGA_198_199_200_SNP_N_GenomeWideSNP_6_C08_955374
WHIRR_p_TCGA_168_169_170_redo_N_GenomeWideSNP_6_C08_845224
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OKRAS_p_TCGA_198_199_200_SNP_N_GenomeWideSNP_6_F10_955324
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AVISO_p_4TCGA_242_238_250_mN_GenomeWideSNP_6_A03_1231578
WHIPS_p_1TCGA_220_235_N_GenomeWideSNP_6_H02_1230922
AVISO_p_4TCGA_242_238_250_mN_GenomeWideSNP_6_A07_1231484
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WAXEN_p_TCGA_252_253_N_GenomeWideSNP_6_A11_1270596
SNOWS_p_TCGA_Batch_309_310_NSP_GenomeWideSNP_6_B02_1362062
COPAL_p_TCGAb_337_338_339_NSP_GenomeWideSNP_6_C08_1373618
WHIRR_p_TCGA_168_169_170_redo_N_GenomeWideSNP_6_C12_845256
WAXEN_p_TCGA_252_253_N_GenomeWideSNP_6_C01_1270618
HORNS_p_TCGA_b110_113_SNP_N_GenomeWideSNP_6_F07_772336
COPAL_p_TCGAb_337_338_339_NSP_GenomeWideSNP_6_A07_1373574
XYLEM_p_TCGASNP_207_212_N_GenomeWideSNP_6_E01_1051160
FRUIT_p_TCGAb_327_328_329_NSP_GenomeWideSNP_6_D08_1367900
FOXED_p_TCGA_b122_128_SNP_N_GenomeWideSNP_6_D10_781864
CONGA_p_TCGA_b_317_318_319_NSP_GenomeWideSNP_6_A08_1365346

Supplementary table 6

Sample annotations for all tumors included in Aine et al.

Gene mutations (m) indicated as 0 (WT) and 1 (Mutant)
Gene copy-number status (cna) indicated as -2 (deletion), -1 (loss), 0 (Neutral), 1 (gain) and 2 (amplification)
Centroid correlations were calculated using Pearson correlation
Cells with NA indicate that the sample was not included in the TCGA publication on BLCA (Nature, Volume 507 Number 7492, 315-322, Mar. 20, 2014 [doi:10.1038])

SampleID	Histology	TCGAclass	Two_group	Three_group	Six_group	UNC	MDA	Lund	FGFR3m	FGFR3cna	PIK3CAm	RASm	chr9pDel	chr9qDel	CDKN2Acna	TP53m	MDM2cna	RB1m	RB1cna	E2F3cna	cor.UNC.Basal	cor.UNC.Luminal	cor.MDA.Basal	cor.MDA.tp53like	cor.MDA.Luminal	cor.Lund.MS1a	cor.Lund.MS1b	cor.Lund.MS2a1	cor.Lund.MS2a2	cor.Lund.MS2b1	cor.Lund.MS2b2.1	cor.Lund.MS2b2.2
TCGA-DK-A6AV	NA	NA	2	2	21	Luminal	Luminal	MS1b	0	0	0	0	0	0	0	0	0	0	0	0	-0.537	0.796	-0.335	-0.189	0.487	0.065	0.475	0.167	0.024	-0.334	-0.214	-0.388
TCGA-DK-A3WX	Non-papillary	3	1	1	11	Basal	Basal	MS2b2.2	0	0	0	0	0	0	-1	0	0	0	0	0	0.843	-0.796	0.744	-0.141	-0.517	-0.293	-0.532	-0.411	-0.064	0.389	0.481	0.754
TCGA-FD-A3SQ	Non-papillary	2	2	3	31	Basal	TP53-like	MS2b1	0	0	0	0	0	0	-1	0	0	0	0	0	0.066	-0.286	-0.062	0.583	-0.269	0.139	-0.046	-0.358	-0.196	0.444	-0.054	-0.09
TCGA-DK-A1AC	Non-papillary	2	2	3	31	Luminal	Luminal	MS2a2	0	0	1	1	0	0	1	1	0	0	-1	2	-0.075	0.296	-0.136	-0.067	0.119	-0.414	-0.292	0.421	0.532	0.214	-0.342	-0.039
TCGA-FD-A43N	NA	NA	2	3	31	Luminal	Luminal	MS1b	0	0	1	0	0	0	0	1	0	0	0	2	-0.62	0.757	-0.183	0.157	0.286	0.014	0.222	0.221	0.16	-0.051	-0.296	-0.424
TCGA-FD-A5BU	NA	NA	1	1	11	Basal	Basal	MS2b2.2	0	0	0	0	0	0	-1	0	0	0	0	0	0.889	-0.822	0.696	0.095	-0.568	-0.173	-0.493	-0.536	-0.203	0.449	0.532	0.709
TCGA-FD-A6TG	NA	NA	2	3	31	Luminal	TP53-like	MS2b1	0	0	0	0	0	0	0	0	1	0	0	1	0.096	0.231	-0.174	0.454	0.019	-0.073	-0.018	-0.021	0.134	0.293	-0.227	-0.206
TCGA-BT-A20J	Non-papillary	4	1	1	12	Basal	Basal	MS2b1	0	0	0	0	0	0	-2	1	0	0	0	0	0.701	-0.639	0.241	0.031	-0.319	-0.312	-0.488	-0.137	0.177	0.43	0.118	0.414
TCGA-E7-A677	NA	NA	2	2	21	Luminal	TP53-like	MS1b	0	0	0	1	1	0	-2	0	0	0	0	0	-0.092	0.007	-0.086	0.101	0.08	0.267	0.39	-0.129	-0.275	-0.219	-0.059	-0.202
TCGA-CF-A47Y	NA	NA	2	2	22	Luminal	Luminal	MS1a	1	0	0	0	0	0	0	1	0	0	0	0	-0.631	0.562	-0.48	0.15	0.296	0.758	0.681	-0.147	-0.589	-0.395	-0.202	-0.578
TCGA-FD-A43P	NA	NA	2	3	31	Luminal	Luminal	MS2a2	0	0	0	1	0	0	0	1	0	1	0	2	-0.33	0.409	-0.182	-0.007	0.189	-0.368	-0.257	0.361	0.544	0.245	-0.367	-0.118
TCGA-LT-A5Z6	NA	NA	2	2	21	Luminal	Luminal	MS2a1	0	0	0	0	0	0	0	1	0	0	-2	1	-0.725	0.787	-0.382	-0.152	0.588	-0.062	0.258	0.647	0.353	-0.387	-0.405	-0.485
TCGA-GC-A3YS	Non-papillary	3	1	1	11	Basal	Basal	MS2b2.2	0	0	0	0	0	0	0	1	0	1	-1	0	0.838	-0.848	0.651	-0.038	-0.608	-0.308	-0.573	-0.4	-0.035	0.439	0.459	0.747
TCGA-S5-A6DX	NA	NA	2	3	31	Luminal	TP53-like	MS2a2	0	0	0	0	0	0	-2	0	1	0	0	0	-0.41	0.314	-0.054	0.306	0.082	-0.202	-0.074	0.016	0.306	0.299	-0.208	-0.18
TCGA-BL-A0C8	Papillary	1	2	2	21	Luminal	Luminal	MS2a1	0	1	0	0	0	0	-1	0	0	0	0	0	-0.579	0.729	-0.438	0.14	0.346	-0.106	0.169	0.471	0.349	-0.12	-0.485	-0.433
TCGA-GC-A6I1	NA	NA	1	1	11	Basal	Basal	MS2b2.2	0	0	0	0	0	0	0	1	0	0	0	0	0.841	-0.854	0.727	-0.212	-0.515	-0.247	-0.56	-0.455	-0.069	0.448	0.449	0.73
TCGA-CU-A5W6	NA	NA	2	3	31	Luminal	Luminal	MS1b	0	1	1	0	0	0	-2	0	0	0	0	0	-0.713	0.644	-0.146	-0.033	0.39	0.034	0.261	0.176	0.072	-0.251	0.019	-0.302
TCGA-DK-A3WY	Non-papillary	4	1	1	12	Basal	TP53-like	MS2b1	0	0	0	0	0	0	0	0	0	0	0	0	0.824	-0.826	0.29	0.296	-0.528	-0.413	-0.61	-0.179	0.244	0.667	0.019	0.444
TCGA-FD-A5BS	NA	NA	1	1	12	Basal	Basal	MS2b1	0	0	0	0	0	0	0	0	0	0	0	0	0.787	-0.819	0.365	0.324	-0.571	-0.355	-0.626	-0.293	0.164	0.75	0.09	0.445
TCGA-FD-A3B6	Papillary	4	1	1	12	Basal	Basal	MS2b2.2	0	0	1	0	0	0	0	1	0	1	0	2	0.752	-0.758	0.582	-0.227	-0.449	-0.413	-0.608	-0.197	0.143	0.411	0.316	0.687
TCGA-FD-A3B5	Non-papillary	3	1	1	11	Basal	Basal	MS2b2.2	0	0	1	0	0	0	-2	0	0	0	0	0	0.721	-0.642	0.625	-0.164	-0.299	-0.034	-0.216	-0.324	-0.244	-0.003	0.509	0.556
TCGA-FT-A3EE	Papillary	1	1	1	11	Basal	Basal	MS1b	0	0	0	1	0	0	0	0	0	0	1	0	0.181	-0.343	0.032	-0.13	0.015	0.211	0.247	-0.236	-0.331	-0.14	0.169	-0.006
TCGA-FD-A3B3	Papillary	3	1	1	11	Basal	Basal	MS2b2.2	0	0	0	0	0	0	0	0	0	0	0	1	0.918	-0.837	0.76	0.046	-0.569	-0.376	-0.662	-0.417	0.022	0.555	0.433	0.788
TCGA-FD-A43U	NA	NA	2	3	31	Luminal	TP53-like	MS2b1	0	0	0	0	0	0	-1	0	0	0	0	0	-0.015	0.049	-0.018	0.345	-0.131	-0.116	-0.146	-0.106	0.131	0.448	-0.166	-0.114
TCGA-BT-A3PK	Papillary	3	1	1	11	Basal	Basal	MS2b2.2	0	0	0	0	0	0	0	0	0	0	0	0	0.814	-0.744	0.659	-0.049	-0.504	-0.333	-0.575	-0.369	0.012	0.469	0.391	0.711
TCGA-FD-A5C1	NA	NA	1	1	11	Basal	Basal	MS2b2.2	0	0	1	0	0	0	0	0	0	0	0	0	0.79	-0.798	0.669	-0.025	-0.526	-0.337	-0.607	-0.427	0.006	0.516	0.47	0.727
TCGA-E7-A4IJ	NA	NA	2	2	21	Luminal	Luminal	MS2a1	0	0	1	0	0	0	0	0	0	0	-2	1	-0.698	0.762	-0.383	-0.117	0.425	0.08	0.257	0.45	0.191	-0.31	-0.354	-0.448
TCGA-GV-A40E	Non-papillary	3	1	1	11	Basal	Basal	MS2b2.2	0	0	0	0	0	0	0	0	0	0	0	2	0.731	-0.708	0.571	-0.226	-0.38	-0.356	-0.459	-0.208	0.098	0.221	0.313	0.678
TCGA-GD-A76B	NA	NA	2	2	21	Luminal	Luminal	MS2a1	0	0	1	0	0	0	-1	0	0	0	0	0	-0.74	0.83	-0.387	0.154	0.472	0.034	0.174	0.344	0.237	-0.044	-0.406	-0.504
TCGA-BT-A20T	Non-papillary	2	2	3	31	Basal	TP53-like	MS2b2.1	1	1	0	0	1	1	-2	0	0	0	0	0	0.054	0.046	0.063	0.183	0.018	0.214	0.138	-0.375	-0.306	0.113	0.243	-0.07
TCGA-UY-A78O	NA	NA	2	2	21	Luminal	Luminal	MS1b	0	0	0	0	0	0	0	1	0	0	0	0	-0.764	0.84	-0.513	0.11	0.554	0.218	0.561	0.284	0.01	-0.341	-0.403	-0.653
TCGA-BT-A0S7	Non-papillary	3	2	3	32	Basal	Basal	MS2b2.2	1	0	0	0	0	0	-2	0	2	0	1	0	0.653	-0.638	0.348	0.016	-0.303	-0.227	-0.388	-0.129	0.061	0.241	0.22	0.441
TCGA-H4-A2HQ	Non-papillary	1	2	2	22	Luminal	Luminal	MS1b	1	0	0	0	0	0	-2	0	2	0	0	0	-0.203	0.316	-0.162	-0.276	0.289	0.328	0.331	0.016	-0.268	-0.462	0.116	-0.125
TCGA-KQ-A41N	NA	NA	2	2	21	Luminal	Luminal	MS1b	0	0	0	0	0	0	0	0	0	0	0	1	-0.459	0.591	-0.392	0.083	0.378	0.204	0.466	0.297	-0.011	-0.372	-0.341	-0.504
TCGA-BT-A0YX	Non-papillary	3	1	1	11	Basal	Basal	MS2b2.1	0	0	0	0	0	0	-2	0	0	0	0	0	0.713	-0.661	0.53	-0.217	-0.297	-0.042	-0.292	-0.456	-0.263	0.149	0.627	0.578
TCGA-CU-A0YO	Non-papillary	2	2	3	31	Luminal	TP53-like	MS1a	0	0	0	0	0	0	0	0	0	0	0	0	-0.449	0.275	-0.142	0.464	0.066	0.397	0.222	-0.333	-0.396	0.148	0.064	-0.291
TCGA-FD-A6TC	NA	NA	2	3	31	Basal	TP53-like	MS2a2	0	0	0	0	0	0	0	1	0	1	0	0	0.426	-0.343	-0.07	0.189	-0.076	-0.206	-0.074	0.06	0.169	0.135	-0.112	0.029
TCGA-BT-A2LA	NA	NA	2	3	32	Basal	TP53-like	MS2a2	0	0	0	0	0	0	0	1	0	1	0	2	0.556	-0.384	0.095	0.111	-0.203	-0.228	-0.24	0.268	0.292	0.081	-0.258	0.112
TCGA-PQ-A6FN	NA	NA	1	1	11	Basal	Basal	MS2b2.2	0	0	0	0	0	0	0	1	0	1	0	0	0.682	-0.694	0.631	-0.025	-0.329	-0.222	-0.372	-0.313	-0.062	0.236	0.411	0.586
TCGA-GC-A3RC	Non-papillary	3	1	1	11	Basal	Basal	MS2b2.2	0	0	0	0	0	0	0	1	0	0	0	0	0.831	-0.801	0.717	-0.261	-0.426	-0.239	-0.456	-0.356	-0.078	0.257	0.426	0.726
TCGA-DK-A2I2	Non-papillary	3	1	1	11	Basal	Basal	MS2b2.2	0	0	0	0	0	0	0	1	0	0	0	1	0.88	-0.835	0.715	-0.083	-0.515	-0.308	-0.579	-0.422	-0.051	0.478	0.456	0.747
TCGA-FD-A3B7	Non-papillary	4	1	1	12	Basal	Basal	MS2b2.2	0	0	0	0	0	0	0	1	0	1	0	0	0.882	-0.861	0.67	0.068	-0.636	-0.321	-0.618	-0.456	-0.045	0.591	0.423	0.728
TCGA-FD-A62S	NA	NA	1	1	12	Basal	Basal	MS2b2.2	0	0	0	0	0	0	-1	1	0	0	0	0	0.912	-0.879	0.673	0.189	-0.679	-0.308	-0.627	-0.462	-0.048	0.618	0.373	0.723
TCGA-G2-A2EL	NA	NA	2	3	32	Basal	Basal	MS2a1	0	0	0	0	0	1	0	1	0	1	0	0	0.49	-0.291	0.166	-0.088	-0.056	-0.197	-0.16	0.262	0.21	-0.116	-0.102	0.192
TCGA-BT-A20U	Non-papillary	3	1	1	11	Basal	Basal	MS2b2.1	0	0	0	0	0	0	-2	1	0	0	0	0	0.703	-0.654	0.477	-0.094	-0.294	-0.032	-0.248	-0.339	-0.23	0.077	0.526	0.51
TCGA-BT-A42F	NA	NA	1	1	11	Basal	Basal	MS2b2.2	0	0	0	0	0	0	0	1	0	0	0	0	0.729	-0.725	0.635	-0.245	-0.371	-0.27	-0.485	-0.385	-0.022	0.352	0.502	0.649
TCGA-FT-A61P	NA	NA	1	1	12	Basal	Basal	MS2b1	0	0	0	0	0	0	0	0	2	0	0	0	0.649	-0.686	0.339	0.236	-0.486	-0.303	-0.507	-0.221	0.074	0.506	0.193	0.469
TCGA-DK-A1A6	Non-papillary	1	2	3	31	Luminal	Luminal	MS2a2	0	0	1	0	0	1	0	1	0	0	0	2	-0.133	0.359	-0.17	-0.306	0.341	-0.273	-0.016	0.283	0.391	-0.016	-0.229	-0.122
TCGA-GU-A767	NA	NA	2	3	31	Luminal	TP53-like	MS1b	0	0	0	0	0	0	0	1	0	0	0	1	-0.654	0.761	-0.354	0.449	0.277	0.12	0.35	0.268	0.1	-0.126	-0.447	-0.549
TCGA-GV-A3JX	Non-papillary	2	2	2	21	Luminal	Luminal	MS2a1	0	0	1	0	0	0	0	1	0	1	0	0	-0.303	0.45	0.07	-0.132	0.181	-0.257	-0.175	0.412	0.364	-0.079	-0.086	-0.005
TCGA-CF-A3MH	Papillary	1	2	2	22	Luminal	Luminal	MS1b	0	1	0	0	1	1	-2	0	1	0	0	0	-0.599	0.515	-0.318	-0.166	0.417	0.492	0.66	-0.035	-0.408	-0.594	0.076	-0.406
TCGA-DK-A1AF	Non-papillary	2	2	3	31	Basal	TP53-like	MS2b1	0	0	0	0	0	0	0	0	0	0	0	0	0.096	-0.13	0.276	0.433	-0.288	-0.063	-0.221	-0.391	-0.128	0.555	0.19	0.107
TCGA-GC-A3WC	Non-papillary	3	1	1	11	Basal	Basal	MS2b2.2	0	0	1	0	0	0	0	1	0	0	0	0	0.8	-0.771	0.484	0.142	-0.458	-0.138	-0.474	-0.42	-0.125	0.408	0.407	0.587
TCGA-BL-A13J	Papillary	2	2	3	31	Luminal	TP53-like	MS1b	0	0	0	0	0	0	-2	1	0	0	-1	1	-0.112	0.13	0.083	0.135	0.046	-0.032	0.088	0.015	-0.031	-0.052	0.032	-0.022
TCGA-BT-A20W	Non-papillary	2	2	3	31	Luminal	Luminal	MS2a1	0	0	0	1	0	0	-1	0	0	0	0	1	-0.682	0.818	-0.445	0.167	0.469	-0.04	0.288	0.403	0.282	-0.095	-0.562	-0.543
TCGA-CU-A0YN	Non-papillary	3	1	1	11	Basal	Basal	MS2b2.2	0	0	0	0	0	0	0	0	0	1	0	1	0.815	-0.799	0.695	-0.186	-0.348	-0.299	-0.455	-0.332	-0.04	0.291	0.463	0.692
TCGA-G2-A2EF	Non-papillary	4	1	1	11	Basal	Basal	MS2b2.2	0	0	0	1	0	0	-2	0	0	0	0	1	0.88	-0.834	0.575	-0.207	-0.451	-0.267	-0.477	-0.304	-0.014	0.355	0.281	0.647
TCGA-FD-A3SN	Papillary	2	1	3	31	Basal	Basal	MS2b2.2	0	0	1	0	0	0	0	0	0	0	0	0	0.524	-0.505	0.306	-0.002	-0.245	-0.189	-0.191	-0.164	0.024	0.109	0.156	0.368
TCGA-CF-A3MF	Papillary	1	2	2	22	Luminal	Luminal	MS1b	0	0	0	0	1	1	-1	0	1	0	0	0	-0.864	0.716	-0.436	0.137	0.418	0.375	0.62	0.147	-0.141	-0.411	-0.37	-0.608
TCGA-DK-A3IK	Papillary	2	2	3	31	Luminal	Luminal	MS1b	0	0	0	0	0	0	-1	1	0	0	0	0	-0.713	0.751	-0.459	0.39	0.423	0.205	0.462	0.184	0.001	-0.131	-0.489	-0.615
TCGA-GD-A6C6	NA	NA	2	2	21	Luminal	Luminal	MS2a1	0	0	1	0	0	0	-2	1	0	0	0	0	-0.17	0.02	-0.193	-0.049	0.138	0.057	0.169	0.209	0.106	-0.254	-0.134	-0.205
TCGA-GU-A763	NA	NA	2	2	22	Luminal	Luminal	MS1b	1	0	0	0	0	1	-2	0	0	0	0	0	-0.778	0.686	-0.378	-0.098	0.442	0.618	0.664	-0.036	-0.457	-0.551	-0.059	-0.496
TCGA-FD-A62P	NA	NA	1	3	31	Basal	Basal	MS2b2.2	0	0	1	0	0	0	0	0	1	0	0	0	0.485	-0.449	0.307	0.165	-0.208	-0.272	-0.338	-0.272	0.092	0.371	0.191	0.387
TCGA-E7-A5KE	NA	NA	2	2	21	Luminal	Luminal	MS2a1	0	1	0	0	1	0	-1	0	0	0	-1	1	-0.847	0.919	-0.471	-0.197	0.589	0.061	0.489	0.51	0.164	-0.616	-0.309	-0.452
TCGA-KQ-A41P	NA	NA	2	2	21	Luminal	TP53-like	MS1b	0	0	0	0	0	0	0	1	0	0	0	0	-0.539	0.493	-0.172	0.27	0.192	0.108	0.155	-0.006	-0.033	0.04	-0.066	-0.288
TCGA-DK-A2I4	Papillary	4	1	1	12	Basal	Basal	MS2b1	0	0	0	0	0	0	0	0	0	0	-1	1	0.648	-0.677	0.369	0.144	-0.476	-0.36	-0.598	-0.216	0.178	0.628	0.138	0.452
TCGA-MV-A51V	NA	NA	2	2	21	Luminal	Luminal	MS2a1	0	0	0	0	0	0	0	0	0	1	-1	0	-0.783	0.832	-0.46	0.165	0.449	0.049	0.351	0.568	0.231	-0.348	-0.458	-0.579
TCGA-E7-A678	NA	NA	2	2	22	Luminal	Luminal	MS1a	1	0	0	0	0	0	0	0	0	0	0	0	-0.717	0.699	-0.482	-0.058	0.423	0.814	0.637	-0.155	-0.59	-0.432	-0.122	-0.565
TCGA-GU-A42R	Papillary	1	2	2	22	Luminal	Luminal	MS1a	1	0	0	0	0	0	-2	0	1	0	0	1	-0.394	0.437	-0.177	-0.146	0.32	0.465	0.453	-0.096	-0.414	-0.47	0.206	-0.244
TCGA-FD-A62O	NA	NA	2	2	21	Luminal	Luminal	MS1b	0	0	0	0	1	1	-1	0	0	0	0	0	-0.681	0.467	-0.426	0.096	0.446	0.261	0.576	0.181	-0.099	-0.328	-0.37	-0.578
TCGA-CU-A3KJ	Non-papillary	3	1	1	11	Basal	Basal	MS2b2.2	0	0	0	0	1	1	-2	1	0	0	0	0	0.81	-0.711	0.612	-0.283	-0.363	-0.206	-0.409	-0.275	-0.084	0.161	0.452	0.666
TCGA-DK-A2HX	Non-papillary	2	2	3	31	Basal	TP53-like	MS2b1	0	0	0	0	0	0	0	0	0	0	0	0	0.255	-0.401	-0.073	0.496	-0.221	-0.206	-0.277	0.061	0.207	0.44	-0.223	-0.015
TCGA-FD-A6TE	NA	NA	2	2	21	Luminal	Luminal	MS2a1	0	0	0	0	0	0	0	1	0	1	0	0	-0.362	0.374	-0.146	-0.294	0.304	-0.019	0.099	0.433	0.14	-0.429	0	-0.106
TCGA-LC-A66R	NA	NA	1	1	11	Basal	Basal	MS2b2.2	0	0	0	0	0	0	0	1	0	1	0	2	0.742	-0.735	0.638	-0.146	-0.439	-0.374	-0.593	-0.263	0.085	0.385	0.375	0.727
TCGA-GC-A3RB	Non-papillary	1	2	3	32	Luminal	Luminal	MS2a1	0	-2	0	0	0	0	0	1	0	0	-1	2	-0.101	0.291	-0.077	-0.326	0.25	-0.001	0.13	0.267	0.122	-0.365	-0.112	-0.05
TCGA-FD-A3N6	NA	NA	1	1	11	Basal	Basal	MS2b2.2	0	0	0	0	0	0	-2	0	0	0	0	0	0.758	-0.691	0.682	-0.259	-0.341	-0.072	-0.304	-0.371	-0.225	0.091	0.477	0.643
TCGA-K4-A5RJ	NA	NA	1	1	12	Basal	Basal	MS2b1	0	0	0	0	0	0	0	1	0	1	0	0	0.667	-0.673	0.386	-0.012	-0.43	-0.395	-0.613	-0.125	0.244	0.527	0.128	0.492
TCGA-GV-A3JW	Non-papillary	1	2	2	21	Luminal	Luminal	MS1b	0	0	0	0	0	0	-2	1	0	0	-2	0	-0.705	0.883	-0.444	-0.017	0.603	0.265	0.561	0.475	0.03	-0.542	-0.448	-0.641
TCGA-DK-A3IN	Papillary	2	2	3	31	Basal	Basal	MS2b1	0	0	0	0	0	0	0	1	0	1	0	0	0.473	-0.358	0.428	0.079	-0.287	-0.359	-0.417	-0.1	0.216	0.425	0.035	0.351
TCGA-CF-A5U8	NA	NA	2	2	22	Luminal	Luminal	MS1b	1	0	0	0	1	1	-2	1	0	0	0	0	-0.843	0.797	-0.532	0.005	0.507	0.669	0.762	0.008	-0.463	-0.502	-0.285	-0.666
TCGA-BT-A3PJ	Papillary	3	1	1	11	Basal	Basal	MS2b2.2	0	0	0	0	0	0	1	1	0	1	-1	2	0.851	-0.826	0.648	-0.268	-0.431	-0.294	-0.498	-0.301	-0.027	0.273	0.421	0.74
TCGA-DK-A1AA	Papillary	1	2	2	22	Luminal	Luminal	MS1a	0	0	0	0	1	1	-2	0	0	0	0	0	-0.655	0.481	-0.244	-0.073	0.322	0.643	0.626	-0.314	-0.663	-0.385	0.199	-0.363
TCGA-GV-A6ZA	NA	NA	2	2	21	Luminal	Luminal	MS1b	0	0	0	0	0	0	-2	0	0	0	0	0	-0.755	0.766	-0.405	-0.27	0.512	0.278	0.478	0.247	-0.052	-0.474	-0.167	-0.487
TCGA-GV-A3JV	Non-papillary	2	2	2	21	Luminal	Luminal	MS1b	0	0	0	0	0	1	0	0	0	0	0	0	-0.687	0.651	-0.384	0.167	0.278	0.014	0.263	0.188	0.139	0.012	-0.447	-0.442
TCGA-DK-A1A5	Non-papillary	2	2	3	31	Basal	Basal	MS2b2.2	0	0	1	0	0	0	-2	1	0	0	0	0	0.501	-0.493	0.131	0.101	-0.233	-0.192	-0.131	-0.205	-0.029	0.212	0.148	0.269
TCGA-CF-A47S	NA	NA	2	2	22	Luminal	Luminal	MS1b	0	0	0	0	0	0	0	0	0	0	0	0	-0.881	0.742	-0.44	-0.021	0.483	0.561	0.687	-0.071	-0.403	-0.386	-0.202	-0.597
TCGA-GD-A3OQ	Papillary	1	1	1	11	Basal	Basal	MS2b2.1	0	0	0	1	0	0	-2	0	0	0	0	0	0.33	-0.329	0.287	-0.284	0.02	0.199	0.276	-0.204	-0.364	-0.362	0.391	0.116
TCGA-FD-A6TA	NA	NA	2	3	31	Luminal	TP53-like	MS2b1	0	0	0	0	0	0	-2	0	0	0	0	1	-0.437	0.478	-0.21	0.291	0.161	-0.011	0.048	-0.071	0.058	0.243	-0.104	-0.248
TCGA-CF-A3MI	Papillary	1	2	2	22	Luminal	Luminal	MS1b	0	-1	0	1	0	0	0	0	1	0	0	0	-0.845	0.818	-0.382	0.026	0.454	0.335	0.533	0.062	-0.16	-0.303	-0.21	-0.546
TCGA-DK-A1AD	Non-papillary	2	2	3	31	Luminal	Luminal	MS2a1	0	0	0	0	0	0	0	1	0	0	0	2	-0.692	0.711	-0.406	0.22	0.387	0.073	0.247	0.264	0.114	-0.118	-0.302	-0.442
TCGA-GC-A3I6	Non-papillary	3	1	1	11	Basal	Basal	MS2b2.1	0	0	1	0	0	0	0	0	0	0	0	0	0.692	-0.732	0.566	-0.172	-0.325	0	-0.271	-0.414	-0.288	0.082	0.602	0.574

TCGA-GC-A3RD	Non-papillary		1	2	3	32	Luminal	Luminal	MS1b	0	0	0	0	0	0	0	0	2	0	0	0	-0.499	0.642	-0.109	-0.192	0.443	0.184	0.387	0.175	-0.063	-0.397	-0.119	-0.31
TCGA-HQ-A5NE	NA	NA		1	1	11	Basal	Basal	MS2b2.1	0	0	1	0	0	0	0	1	0	0	0	1	0.49	-0.68	0.502	-0.049	-0.231	0.058	-0.016	-0.317	-0.301	-0.013	0.397	0.306
TCGA-CU-A3YL	Papillary		1	2	2	21	Luminal	Luminal	MS1b	0	0	0	0	1	0	-2	0	0	0	0	0	-0.845	0.817	-0.482	0.218	0.431	0.296	0.486	0.203	-0.043	-0.265	-0.359	-0.629
TCGA-CU-A72E	NA	NA		1	1	11	Basal	Basal	MS2b2.1	1	0	1	0	1	1	-2	0	0	0	0	0	0.501	-0.463	0.335	0.101	-0.185	0.18	-0.056	-0.474	-0.431	0.063	0.612	0.297
TCGA-CF-A5UA	NA	NA		2	2	22	Luminal	Luminal	MS1b	0	1	1	1	0	0	-2	0	2	0	0	1	-0.599	0.538	-0.359	-0.073	0.26	0.434	0.469	-0.003	-0.301	-0.424	-0.022	-0.354
TCGA-FD-A3SS	Non-papillary		2	1	3	31	Basal	Basal	MS2a1	0	0	0	0	0	0	0	1	-1	0	-2	0	0.308	-0.13	0.197	0.021	-0.048	-0.314	-0.229	0.313	0.313	-0.068	-0.101	0.229
TCGA-DK-A2I1	Papillary		2	2	3	31	Luminal	TP53-like	MS2a2	0	0	0	0	0	0	-2	1	0	0	0	0	-0.424	0.6	-0.282	0.36	0.23	-0.122	0.079	0.192	0.258	0.223	-0.432	-0.389
TCGA-K4-A3WU	Non-papillary		2	2	3	31	Luminal	TP53-like	MS2b1	0	0	0	0	0	0	0	0	1	0	0	0	-0.396	0.56	-0.126	0.611	0.087	-0.061	-0.044	0.041	0.147	0.352	-0.269	-0.286
TCGA-BT-A2LD	Non-papillary		4	1	3	31	Basal	Basal	MS2b2.2	0	0	0	0	0	0	0	1	0	0	0	2	0.436	-0.463	0.225	0.11	-0.226	-0.409	-0.406	0.094	0.338	0.254	-0.062	0.353
TCGA-DK-A3IV	Non-papillary		1	2	2	21	Luminal	Luminal	MS2a1	0	0	0	0	0	0	0	1	0	1	-1	0	-0.735	0.783	-0.247	-0.152	0.365	-0.077	0	0.428	0.301	-0.119	-0.23	-0.276
TCGA-CF-A1HS	Non-papillary		3	1	1	11	Basal	Basal	MS2b2.2	0	0	0	0	0	0	0	1	0	0	-1	1	0.702	-0.76	0.674	-0.244	-0.274	-0.24	-0.338	-0.191	-0.026	0.095	0.379	0.597
TCGA-FD-A5BV	NA	NA		2	3	31	Luminal	Luminal	MS1b	0	0	0	0	1	0	-1	1	0	0	0	0	-0.748	0.792	-0.393	0.045	0.353	0.149	0.379	0.356	0.022	-0.353	-0.346	-0.427
TCGA-GV-A40G	Non-papillary		1	2	2	21	Luminal	Luminal	MS2a1	0	-1	0	0	0	1	0	1	0	1	0	1	-0.762	0.648	-0.412	-0.119	0.475	-0.106	0.236	0.67	0.37	-0.422	-0.382	-0.416
TCGA-PQ-A6FI	NA	NA		1	1	11	Basal	Basal	MS2b2.2	0	0	0	0	0	0	0	1	0	1	0	2	0.833	-0.787	0.706	-0.268	-0.422	-0.222	-0.411	-0.283	-0.078	0.114	0.448	0.736
TCGA-GU-A42Q	NA	NA		1	1	11	Basal	Basal	MS2b2.2	0	0	0	0	0	0	0	1	0	0	0	0	0.802	-0.749	0.562	-0.16	-0.382	-0.026	-0.203	-0.278	-0.233	-0.053	0.428	0.568
TCGA-CF-A3MG	Papillary		1	2	2	22	Luminal	Luminal	MS1b	0	0	0	0	1	1	-2	0	0	0	0	0	-0.876	0.867	-0.453	-0.267	0.611	0.369	0.744	0.261	-0.206	-0.743	-0.166	-0.53
TCGA-FD-A5C0	NA	NA		2	3	31	Luminal	TP53-like	MS2a2	0	0	0	0	0	0	-1	0	0	1	0	0	-0.029	0.125	-0.111	0.199	0.12	-0.176	-0.026	0.174	0.19	-0.001	-0.064	-0.044
TCGA-E7-A3Y1	Papillary		1	2	2	22	Luminal	Luminal	MS1a	1	0	0	0	0	0	0	0	0	0	0	0	-0.587	0.583	-0.429	0.191	0.269	0.718	0.501	-0.184	-0.547	-0.304	-0.012	-0.479
TCGA-E7-A6MF	NA	NA		2	2	22	Luminal	Luminal	MS1a	0	0	0	1	0	0	0	0	0	0	0	0	-0.165	-0.021	-0.252	0.105	0.109	0.647	0.36	-0.221	-0.534	-0.17	-0.079	-0.324
TCGA-G2-A3VY	Non-papillary		1	2	2	21	Luminal	Luminal	MS2a1	0	0	1	0	1	0	-1	1	0	0	0	2	-0.775	0.873	-0.524	-0.142	0.618	0.125	0.458	0.618	0.219	-0.555	-0.528	-0.585
TCGA-K4-A6MB	NA	NA		2	3	31	Luminal	Luminal	MS2a1	0	1	0	0	1	0	-1	1	0	0	0	2	-0.612	0.75	-0.114	0.17	0.317	-0.045	0.233	0.327	0.227	-0.19	-0.324	-0.36
TCGA-FD-A6TB	NA	NA		1	1	12	Basal	TP53-like	MS2b1	0	0	0	0	0	0	0	0	1	0	0	0	0.529	-0.747	0.171	0.456	-0.411	-0.282	-0.502	-0.215	0.164	0.617	0.068	0.3
TCGA-GD-A3OS	Non-papillary		4	2	3	32	Basal	Basal	MS2b2.2	0	0	0	0	1	0	-2	1	0	0	0	0	0.848	-0.763	0.447	0.191	-0.508	-0.275	-0.499	-0.128	0.11	0.388	0.062	0.499
TCGA-BT-A20V	NA	NA		2	3	32	Basal	Basal	MS2b2.2	0	-1	0	0	1	0	-1	0	0	0	0	0	0.409	-0.458	0.175	-0.229	-0.071	-0.117	-0.17	0.049	0.078	-0.083	0.055	0.295
TCGA-K4-A3WV	Non-papillary		3	2	3	32	Basal	Basal	MS2b2.2	0	-1	0	0	0	0	-2	0	1	0	0	1	0.628	-0.5	0.213	0.006	-0.149	-0.076	-0.145	-0.009	0.008	-0.067	0.103	0.289
TCGA-FD-A3B4	NA	NA		1	1	11	Basal	Basal	MS2b2.2	0	0	0	0	0	0	0	0	0	0	0	0	0.887	-0.853	0.74	0.083	-0.585	-0.227	-0.525	-0.462	-0.141	0.446	0.421	0.742
TCGA-GU-A42P	NA	NA		2	2	21	Luminal	Luminal	MS2a1	0	0	0	0	0	0	0	1	0	0	0	1	-0.751	0.844	-0.457	0.002	0.447	-0.114	0.233	0.693	0.412	-0.381	-0.532	-0.441
TCGA-FJ-A3Z9	NA	NA		2	2	22	Luminal	Luminal	MS1b	0	0	0	1	0	0	0	0	0	0	0	0	-0.742	0.761	-0.328	-0.216	0.566	0.406	0.736	0.184	-0.221	-0.665	-0.273	-0.528
TCGA-FD-A6TK	NA	NA		1	1	12	Basal	Basal	MS2b2.2	0	0	0	0	0	0	0	1	0	0	0	0	0.769	-0.759	0.54	0.155	-0.575	-0.334	-0.59	-0.333	0.056	0.579	0.226	0.616
TCGA-FJ-A3Z7	Non-papillary		2	2	3	31	Luminal	TP53-like	MS2a2	0	0	0	0	0	0	0	1	0	0	0	1	-0.097	0.283	-0.202	0.28	0.02	-0.148	-0.133	0.284	0.322	0.256	-0.42	-0.255
TCGA-FD-A5BR	NA	NA		2	3	31	Luminal	TP53-like	MS2b1	0	0	0	0	0	0	-2	1	0	0	0	0	-0.352	0.447	-0.02	0.441	0.076	0.114	0.075	-0.112	-0.073	0.213	-0.11	-0.242
TCGA-C4-A0EZ	NA	NA		2	3	32	Basal	Basal	MS2a2	0	0	0	0	0	0	0	1	0	0	-2	2	0.664	-0.528	0.194	0.126	-0.17	-0.288	-0.268	0.233	0.277	0.04	-0.118	0.237
TCGA-GC-A3BM	Non-papillary		1	2	2	22	Luminal	Luminal	MS1a	1	0	0	0	0	1	-1	0	0	0	-1	0	-0.162	0.287	-0.112	-0.153	0.235	0.52	0.353	-0.231	-0.536	-0.364	0.316	-0.125
TCGA-K4-A4AC	NA	NA		1	1	11	Basal	Basal	MS2b2.2	0	0	0	0	0	0	-1	1	0	0	-1	1	0.812	-0.863	0.686	-0.178	-0.446	-0.239	-0.443	-0.372	-0.092	0.233	0.487	0.737
TCGA-G2-A2EO	Non-papillary		2	2	3	31	Basal	TP53-like	MS2b1	1	0	1	0	0	0	0	1	0	0	0	0	0.079	-0.002	-0.012	0.131	-0.092	-0.051	-0.084	-0.212	-0.04	0.295	0.093	0.018
TCGA-DK-A6B5	NA	NA		2	3	32	Basal	Basal	MS2b2.2	0	-1	1	0	1	1	-2	0	0	0	0	0	0.553	-0.57	0.379	-0.161	-0.181	-0.091	-0.319	-0.275	-0.064	0.118	0.452	0.464
TCGA-FD-A5BY	NA	NA		1	1	11	Basal	Basal	MS2b2.2	0	-1	0	0	0	0	0	0	0	0	-1	0	0.717	-0.73	0.473	-0.01	-0.362	-0.131	-0.328	-0.322	-0.156	0.181	0.456	0.56
TCGA-DK-A1A7	Non-papillary		1	2	3	31	Luminal	Luminal	MS1b	0	-1	0	0	0	0	0	0	2	0	0	0	-0.652	0.721	-0.382	0.173	0.458	0.167	0.381	0.266	0.058	-0.227	-0.353	-0.535
TCGA-C4-A0F0	Non-papillary		3	1	1	12	Basal	Basal	MS2b2.2	0	0	0	0	0	0	0	0	0	1	0	0	0.848	-0.839	0.683	-0.122	-0.51	-0.316	-0.504	-0.292	-0.04	0.326	0.367	0.74
TCGA-G2-A2EJ	Non-papillary		3	1	1	11	Basal	Basal	MS2b2.2	0	0	1	1	0	0	0	1	0	0	0	0	0.779	-0.755	0.663	-0.354	-0.291	-0.146	-0.265	-0.3	-0.154	0.001	0.496	0.645
TCGA-HQ-A2OF	NA	NA		2	2	21	Luminal	Luminal	MS2a1	0	0	0	0	1	1	-1	1	0	0	0	-1	-0.16	0.257	-0.185	-0.06	0.134	-0.06	0.087	0.336	0.174	-0.23	-0.219	-0.124
TCGA-BL-A3JM	NA		4	2	3	32	Basal	Basal	MS2b2.2	0	0	0	0	0	0	0	1	0	1	-1	0	0.659	-0.495	0.193	0.024	-0.296	-0.293	-0.401	0.113	0.251	0.23	-0.101	0.322
TCGA-FD-A3SP	Non-papillary		4	1	1	12	Basal	Basal	MS2b1	0	0	0	0	0	0	-1	1	0	0	0	1	0.855	-0.84	0.447	0.285	-0.672	-0.367	-0.677	-0.325	0.1	0.706	0.165	0.613
TCGA-DK-A3IM	Papillary		3	1	1	11	Basal	Basal	MS2b2.2	0	0	0	0	0	0	0	1	0	0	0	0	0.773	-0.674	0.615	-0.322	-0.241	-0.118	-0.189	-0.094	-0.087	-0.179	0.311	0.563
TCGA-FD-A43S	NA	NA		2	3	31	Basal	TP53-like	MS2b1	0	0	0	0	0	0	0	0	0	0	0	0	0.045	-0.166	-0.021	0.661	-0.241	0.219	-0.052	-0.4	-0.263	0.476	0.032	-0.142
TCGA-E7-A4XJ	NA	NA		2	2	22	Luminal	Luminal	MS1b	0	0	0	1	0	0	0	0	0	0	0	0	-0.659	0.72	-0.317	0.015	0.425	0.327	0.619	0.182	-0.139	-0.462	-0.35	-0.541
TCGA-FD-A3B8	Non-papillary		4	1	1	12	Basal	Basal	MS2b1	0	0	0	0	0	0	0	1	0	0	0	0	0.874	-0.853	0.566	0.329	-0.676	-0.318	-0.666	-0.461	-0.009	0.729	0.343	0.65
TCGA-E7-A5KF	NA	NA		2	2	22	Luminal	Luminal	MS1b	1	0	0	0	1	1	-2	0	0	0	0	0	-0.862	0.791	-0.464	-0.231	0.568	0.559	0.742	0.195	-0.323	-0.727	-0.178	-0.591
TCGA-HQ-A5ND	NA	NA		1	1	11	Basal	Basal	MS2b2.1	0	0	0	0	0	0	-2	1	0	0	0	0	0.539	-0.49	0.313	-0.287	-0.152	0.033	-0.042	-0.134	-0.226	-0.257	0.441	0.396
TCGA-DK-A6B1	NA	NA		2	2	21	Luminal	Luminal	MS2a1	0	0	0	0	0	0	0	0	0	0	-1	1	-0.802	0.811	-0.514	0.043	0.424	-0.064	0.206	0.663	0.345	-0.225	-0.558	-0.53
TCGA-K4-A5RH	NA	NA		1	1	12	Basal	Basal	MS2b1	0	0	0	0	0	0	0	1	0	1	0	0	0.848	-0.809	0.413	0.144	-0.572	-0.398	-0.647	-0.162	0.218	0.628	0.058	0.51
TCGA-BL-A5ZZ	NA	NA		1	1	12	Basal	Basal	MS2b1	0	0	0	0	0	0	-1	0	0	0	0	0	0.797	-0.766	0.54	0.252	-0.584	-0.347	-0.568	-0.307	0.077	0.634	0.155	0.537
TCGA-GC-A3OO	Non-papillary		2	2	3	31	Luminal	TP53-like	MS2b1	0	0	1	0	0	0	0	1	0	0	0	0	-0.109	0.118	-0.011	0.468	-0.148	-0.023	-0.052	-0.043	-0.058	0.174	0.073	-0.034
TCGA-DK-A2I6	Non-papillary		3	1	1	11	Basal	Basal	MS2b2.2	0	0	0	0	0	0	0	1	0	0	-1	1	0.715	-0.711	0.348	-0.234	-0.301	-0.277	-0.284	-0.057	0.081	0.027	0.239	0.501
TCGA-FD-A3SM	Papillary		2	2	3	31	Basal	TP53-like	MS2b1	1	0	0	0	1	1	-2	0	0	0	0	0	0.358	-0.423	-0.029	0.181	-0.173	-0.034	-0.123	-0.086	-0.025	0.173	0.058	0.078
TCGA-C4-A0F6	Non-papillary		2	2	3	31	Luminal	Luminal	MS1b	0	0	0	0	0	0	-2	0	2	0	0	0	-0.46	0.509	-0.192	0.026	0.276	0.066	0.172	0.162	0.039	-0.131	-0.072	-0.275
TCGA-BT-A3PH	Non-papillary		1	2	3	31	Luminal	Luminal	MS1b	0	0	0	1	0	0	0	1	0	1	0	0	-0.654	0.645	-0.277	-0.116	0.414	-0.041	0.338	0.318	0.179	-0.346	-0.196	-0.34
TCGA-BT-A20X	NA	NA		1	1	11	Basal	Basal	MS2b2.2	0	0	0	0	0	0	-1	1	0	0	0	0	0.84	-0.766	0.723	-0.128	-0.474	-0.145	-0.444	-0.436	-0.209	0.291	0.535	0.706
TCGA-E7-A3X6	Papillary		1	1	1	11	Basal	Basal	MS2b2.1	1	0	0	0	1	1	-2	0	0	0	-1	0	0.498	-0.562	0.263	-0.22	-0.113	0.173	-0.084	-0.517	-0.433	0.038	0.696	0.367
TCGA-DK-A1AG	Papillary		1	2	2	22	Luminal	Luminal	MS1a	1	0	1	0	1	1	-2	0	0	0	0	0	-0.603	0.311	-0.188	-0.143	0.273	0.601	0.494	-0.287	-0.585	-0.405	0.328	-0.265
TCGA-GC-A6I3	NA	NA		2	3	31	Luminal	Luminal	MS2a2	0	0	1	0	0	0	-2	1	0	0	0	1	-0.341	0.374	-0.199	0.118	0.159	-0.083	-0.062	0.15	0.248	0.187	-0.309	-0.223
TCGA-DK-A3IQ	Papillary	NA		2	3	31	Basal	TP53-like	MS2b1	0	0	0	0	0	0	0	0	0	0	0	0	0.71	-0.745	0.117	0.593	-0.468	-0.035	-0.254	-0.343	-0.126	0.585	-0.057	0.141
TCGA-BT-A2LB	Non-papillary		2	2	3	31	Luminal	TP53-like	MS2b1	0	0	0	1	0	0	0	1	0	0	0	0	-0.27	0.252	0.029	0.307	0.008	0.024	0.142	-0.077	-0.023	0.152	-0.158	-0.221
TCGA-DK-A6B0	NA	NA		2	2	22	Luminal	Luminal	MS1a	1	0	0	0	0	0	0	0	0	0	0	0	-0.787	0.647	-0.461	-0.081	0.411	0.752	0.694	-0.105	-0.562	-0.499	-0.106	-0.571
TCGA-E5-A4TZ	NA	NA		2	3	32	Luminal	Basal	MS2b2.1	0	-1	0	0	0	0	0	1	0	1	0	2	0.099	0.12	0.244	-0.358	0.149	0.02	0.041	0.086	-0.029	-0.361	0.209	0.175
TCGA-FD-A3SJ	Non-papillary		2	2	3	31	Luminal	TP53-like	MS2a1	0	0	1	0	0	0	0	1	0	0	0	2	-0.383	0.568	-0.343	0.422	0.168	-0.094	0.08	0.432	0.335	0.035	-0.552	-0.426
TCGA-GD-A2C5	Papillary		2	2	3	31	Luminal	Luminal	MS1b	0	-1	0	0	0	1	0	1	0	0	0	0	-0.536	0.535	-0.461	0.271	0.331	0.067	0.322	0.256	0.114	-0.069	-0.454	-0.515
TCGA-DK-A1AE	Non-papillary		3	1	1	11	Basal	Basal	MS2b2.2	0	0	0	0	0	0	-2	0	0	0	-1	0	0.664	-0.584	0.282	-0.075	-0.213	0	-0.168	-0.196	-0.171	-0.015	0.29	0.399
TCGA-FD-A3NA	Non-papillary		2	2	3	31	Luminal	Luminal	MS1b	0	0	1	0	0	0	-2	1	0	0	0	0	-0.439	0.593	0.121	-0.108	0.247	-0.004	0.236	0.076	0.012	-0.165	0.025	-0.198
TCGA-G2-A2EK	Non-papillary		2	2	3	31	Luminal	TP53-like	MS1b	0	0	0	0	0	0	0	0	2	0	0	0	-0.779	0.72	-0.452	0.383	0.351	0.406	0.463	-0.055	-0.285	-0.13	-0.152	-0.54
TCGA-FD-A3SO	Non-papillary		3	1	1	11	Basal	Basal	MS2b2.2	0	0	1	0	0	0	0	1	0	1	0	0	0.804	-0.774	0.644	-0.119	-0.499	-0.371	-0.596	-0.289	0.078	0.424	0.38	0.712
TCGA-FD-A5BX	NA	NA		1	1	12	Basal	TP53-like	MS2b1	0	0	1	1	0	0	-2	0	0	0	0	0	0.722	-0.822	0.299	0.311	-0.587	-0.22	-0.519	-0.355	0.002	0.664	0.167	0.407
TCGA-GV-A3QK	Non-papillary		1	2	2	21	Luminal	Luminal	MS1b	0	0	0	0	0	0	-2	0	0	0	0	0	-0.8	0.847	-0.487	-0.123	0.634	0.206	0.483	0.287	0.034	-0.323	-0.3	-0.62
TCGA-K4-A3WS	Non-papillary		2	2	3	31	Basal	TP53-like	MS2b1	0	0	1	0	0	0	-1	0	0	0	0	0	0.068	-0.115	-0.03	0.615	-0.216	-0.199	-0.217	-0.102	0.181	0.543	-0.192	-0.07
TCGA-DK-A3IU	NA		4	1	1	12	Basal	Basal	MS2b1	0	0	0	0	0	0	0	1	0	0	1	1	0.719	-0.742	0.44	0.322	-0.511	-0.371	-0.646	-0.294	0.167	0.686	0.157	0.526
TCGA-CF-A1HR	Non-papillary		2	2	3	31	Luminal	Luminal	MS1b	0	0	0	0	0	0	-2	0	0	0	0	0	-0.68	0.585	-0.399	0.209	0.321	0.271	0.37	0.057	-0.096	-0.147	-0.194	-0.486
TCGA-KQ-A41Q	NA	NA		2	2	21	Luminal	Luminal	MS2a1	0	0	0	0	0	0	0	0	0	1	-1	1	-0.712	0.814	-0.412	-0.12	0.525	0.019	0.428	0.525	0.221	-0.455	-0.481	-0.488
TCGA-FD-A6TI	NA	NA		2	3	31	Luminal	TP53-like	MS1a	0	0	0	0	0	0	0	0	0	0	0	0	-0.536	0.542	-0.308	0.335	0.235	0.296	0.265	0.048	-0.138	0	-0.291	-0.453
TCGA-BL-A13I	Non-papillary		4	1	1	12	Basal	Basal	MS2b1	0	0	0	0	0	0	-1	0	0	0	0	0	0.735	-0.757	0.32	0.081	-0.498	-0.384	-0.558	-0.164	0.206	0.555	0.084	0.459
TCGA-CF-A47X	NA	NA		2	2	21	Luminal	Luminal	MS1b	0	0	0	1	0	0	0	0	0	0	0	1	-0.79	0.918	-0.547	-0.017	0.595	0.514	0.673	0.173	-0.248	-0.44	-0.368	-0.722
TCGA-E5-A2PC	Non-papillary		1	1	1	11	Basal	Basal	MS2b2.1	1	0	1	0	1	1	-2	1	0	0	-1	-1	0.518	-0.495	0.148	-0.299	-0.049	0.138	-0.009	-0.264	-0.304	-0.186	0.549	0.295
TCGA-R3-A69X	NA	NA		2	3	31	Luminal	TP53-like	MS2b1	0	0	0	0	0	0	-1	0	0	0	0	0	-0.209	0.042	-0.182	0.442	-0.074	-0.116	-0.106	-0.052	0.127	0.379	-0.143	-0.14
TCGA-CU-A3QU	Non-papillary		1	2	2	21	Luminal	Luminal	MS2a1	0	0	0	0	0	1	1	0	0	0	-2	1	-0.783	0.871	-0.42	-0.192	0.542	-0.123	0.241	0.751	0.413	-0.41	-0.484	-0.473
TCGA-DK-A3X2	Papillary		1	2	3	32	Basal	Basal	MS2a1	0	-1	0	0	0	0	0	1	0	1	-2	-1	0.248	-0.208	0.176	-0.321	0.084	-0.016	0.038	0.227	0.037	-0.426	0.133	0.151
TCGA-GD-A3OP	Papillary		2	2	3	31	Luminal	TP53-like	MS1b	0	0	1	0	0	0	0	0	0	0	0	0	-0.739	0.828	-0.526	0.434	0.3	0.327	0.374	0.153	-0.097	-0.012	-0.498	-0.646
TCGA-E7-A7DU	NA	NA		2	2	22	Luminal	Luminal	MS1b	1	0	1	0	1	1	-2	1	0	0	0	0	-0.821	0.794	-0.486	-0.067	0.487	0.617	0.699	0.015	-0.424	-0.556	-0.101	-0.583
TCGA-E7-A7DV	NA	NA		1	1	12	Basal	Basal	MS2b1	1	0	0	0	0	0	0	1	0	0	0	2	0.647	-0.687	0.368	-0.056	-0.416	-0.452	-0.608	-0.149	0.277	0.556	0.178	0.489
TCGA-BT-A20Q	Non-papillary		2	2	3	31	Basal	TP53-like	MS2b1	0	0	1	0	1	1	-2	0	0	0	0	0	0.246	-0.459	-0.071	0.346	-0.167	0.258	0.05	-0.453	-0.361	0.291	0.199	-0.065
TCGA-CF-A47W	NA	NA		2	2	22	Luminal	Luminal	MS1b	1	0	0	0	0	0	0	0	0	0	0	0	-0.727	0.662	-0.494	0.004	0.379	0.677	0.691	0	-0.447	-0.505	-0.224	-0.611
TCGA-CU-A0YR	Non-papillary		2	2	3	31	Luminal	Luminal	MS2a2	0	0	0	0	0	0	0	0	0	0	0	0	-0.273	0.358	-0.028	-0.097	0.183	-0.354	-0.073	0.21	0.422	0.143	-0.24	-0.095
TCGA-BT-A20O	Non-papillary		4	1	1	12	Basal	Basal	MS2b1	0	0	1	0	0	0	0	1	0	0	0	0	0.812	-0.787	0.405	0.082	-0.558	-0.401	-0.652	-0.218	0.192	0.641	0.143	0.537
TCGA-DK-A6AW	NA	NA		2	2	21	Luminal	TP53-like	MS1a	0	0	1	1	0	0	0	0	0	0	0	0	-0.179	0.059	-0.13	0.098	0.062	0.191	0.135	0.121	-0.086	-0.113	-0.138	-0.222
TCGA-DK-A1A3	Papillary		2	2	3	31	Luminal	TP53-like	MS2a2	0	0	0	0	0	0	-1	1	0	0	0	0	-0.152	0.205	-0.246	0.246	0.126	-0.269	-0.193	0.24	0.384	0.283	-0.323	-0.134
TCGA-K4-A4AB	NA	NA		2	3	31	Basal	TP53-like	MS1a	0	0	1	0	0	0	-2	1	0	0	0	0	0.195	-0.374	0.07	0.399	-0.196	0.391	0.047	-0.473	-0.499	0.239	0.288	-0.054
TCGA-UY-A78K	NA	NA		2	3	31	Luminal	Luminal	MS2a2	0	0	0	0	0	0	0	1	0	0	-1	2	-0.485	0.686	-0.278	0.018	0.229	-0.353	-0.229	0.51	0.576	0.172	-0.435	-0.205
TCGA-K4-A5RI	NA	NA		1	1	11	Basal	Basal	MS2b2.1	0	0	0	0	0	0	-2	1	0	0	0	0	0.695	-0.665	0.376	0.043	-0.348	-0.043	-0.319	-0.358	-0.238	0.145	0.577	0.543
TCGA-GU-A766	NA	NA		1	1	11	Basal	Basal	MS2b2.2	0	0	0	0	0	0	0	1	0	0	0	0	0.772	-0.761	0.692	0.019	-0.53	-0.317	-0.587	-0.419	0.002	0.525	0.393	0.697
TCGA-FD-A62N	NA	NA		1	1	12	Basal	Basal	MS2b1	0	0	0	0	0	0	0	1	0	1	0	0	0.816	-0.808	0.61	0.115	-0.63	-0.363	-0.695	-0.384	0.074	0.682	0.292	0.673
TCGA-FD-A3SL	Non-papillary		2	2	3	31	Luminal	TP53-like	MS2b1	0	0	0	0	0	0	0	1	0	1	0	0	-0.256	0.338	-0.252	0.512	-0.017	-0.185	-0.147	0.272	0.318	0.357	-0.467	-0.271
TCGA-CF-A27C	Papillary		1	2	2	22	Luminal	Luminal	MS1b	1	1	0	0	1	1	-2	0	0	0	0	0	-0.792	0.802	-0.479	-0.218	0.562	0.586	0.752	0.106	-0.389	-0.67	-0.114	-0.592
TCGA-DK-A3X1	Non-papillary		2	2	2	21	Luminal	Luminal	MS1b	0	0	1	0	0	0	0	1	0	1	0	0	-0.195	0.325	-0.211	-0.055	0.327	0.022	0.267	0.249	0.111	-0.25	-0.256	-0.285

TCGA-BT-A20R	Non-papillary		2	2	3	31	Basal	TP53-like	MS2b1	0	0	1	0	0	0	0	1	0	1	0	2	0.257	-0.209	-0.049	0.333	-0.16	-0.318	-0.351	0.165	0.351	0.419	-0.286	0.045
TCGA-GV-A3QG	Papillary		4	1	1	12	Basal	TP53-like	MS2b1	0	0	0	0	0	0	0	0	0	0	0	0	0.344	-0.437	0.112	0.289	-0.309	-0.451	-0.484	0.02	0.421	0.6	-0.213	0.189
TCGA-FD-A3SR	Non-papillary		2	2	3	31	Basal	TP53-like	MS2a2	0	0	0	0	0	0	-1	1	0	0	0	1	0.106	0.001	-0.169	0.296	-0.023	-0.314	-0.353	0.264	0.429	0.375	-0.332	-0.033
TCGA-E7-A541	NA	NA		2	2	21	Luminal	Luminal	MS2a2	0	0	0	0	0	0	0	0	1	0	-2	0	-0.452	0.522	-0.18	-0.157	0.178	-0.11	-0.052	0.176	0.204	0.007	-0.089	-0.09
TCGA-GV-A3QH	Non-papillary		1	2	2	21	Luminal	Luminal	MS2a1	0	0	0	0	0	0	-2	1	0	0	0	2	-0.831	0.9	-0.409	-0.204	0.553	0.017	0.358	0.658	0.315	-0.523	-0.445	-0.517
TCGA-G2-A3IB	Non-papillary		3	1	1	11	Basal	Basal	MS2b2.2	0	-1	0	0	1	0	-1	1	0	0	0	0	0.697	-0.638	0.589	-0.319	-0.209	-0.001	-0.114	-0.257	-0.241	-0.159	0.487	0.509
TCGA-BT-A20N	Non-papillary		1	2	3	32	Basal	Luminal	MS1b	0	0	0	0	0	0	-1	1	0	0	-1	0	0.108	0.082	0.057	-0.31	0.19	0.08	0.176	0.129	-0.093	-0.374	0.056	0.031
TCGA-E7-A6ME	NA	NA		2	3	32	Luminal	Luminal	MS2a1	0	0	0	0	0	0	0	1	0	1	-1	0	-0.606	0.758	-0.291	0.077	0.369	-0.088	0.109	0.55	0.342	-0.171	-0.406	-0.408
TCGA-DK-A3IT	Non-papillary		2	2	3	31	Luminal	TP53-like	MS2a2	0	-1	0	0	0	0	0	0	0	0	0	0	-0.322	0.227	-0.141	0.256	0.116	-0.289	-0.034	0.215	0.347	0.122	-0.246	-0.131
TCGA-UY-A78L	NA	NA		1	1	11	Basal	Basal	MS2b2.2	0	0	0	0	0	0	0	1	0	1	0	0	0.699	-0.697	0.485	-0.081	-0.294	-0.368	-0.433	-0.055	0.167	0.191	0.268	0.535
TCGA-CF-A47V	NA	NA		2	2	22	Luminal	Luminal	MS1b	1	2	0	0	0	1	0	0	0	0	0	0	-0.727	0.511	-0.391	0.154	0.232	0.534	0.598	-0.133	-0.388	-0.251	-0.219	-0.553
TCGA-FJ-A3ZF	Papillary		1	2	2	21	Luminal	Luminal	MS2a1	1	0	0	0	0	0	0	1	0	0	0	2	-0.821	0.917	-0.518	-0.094	0.599	-0.037	0.343	0.703	0.378	-0.42	-0.651	-0.555
TCGA-FD-A6TH	NA	NA		1	3	31	Basal	Basal	MS2a2	0	0	0	0	0	0	0	0	0	1	0	0	0.577	-0.541	0.202	0.08	-0.238	-0.385	-0.401	0.118	0.337	0.248	-0.126	0.335
TCGA-FD-A3N5	Non-papillary		3	1	1	11	Basal	Basal	MS2b2.2	0	0	0	0	0	0	1	1	0	1	-2	2	0.699	-0.663	0.669	-0.169	-0.333	-0.26	-0.374	-0.195	-0.032	0.074	0.422	0.676
TCGA-K4-A54R	NA	NA		2	3	31	Basal	Basal	MS2b1	0	-1	1	0	0	0	0	1	0	1	-1	1	0.34	-0.478	0.103	-0.068	-0.119	-0.29	-0.262	-0.064	0.209	0.311	-0.004	0.194
TCGA-GV-A3QI	Papillary		1	2	3	32	Luminal	Luminal	MS2a1	0	0	0	0	0	0	0	0	0	0	-2	0	-0.137	0.176	-0.201	-0.066	0.181	0.061	0.216	0.438	0.087	-0.381	-0.292	-0.238
TCGA-HQ-A2OE	Papillary		1	2	2	21	Luminal	Luminal	MS1b	0	0	0	0	1	1	-1	0	1	0	-1	1	-0.623	0.464	-0.31	-0.178	0.403	0.02	0.345	0.321	0.154	-0.384	-0.263	-0.33
TCGA-G2-A3IE	Non-papillary		1	2	2	21	Luminal	Luminal	MS1b	0	0	0	0	0	0	-1	1	0	0	0	0	-0.816	0.863	-0.563	-0.038	0.602	0.368	0.626	0.273	-0.085	-0.448	-0.432	-0.685
TCGA-H4-A2HO	Papillary		1	2	2	21	Luminal	Luminal	MS2a1	0	0	1	0	0	0	0	0	1	0	0	0	-0.836	0.839	-0.553	0.226	0.426	0.069	0.251	0.37	0.199	-0.028	-0.552	-0.588
TCGA-KQ-A41S	NA	NA		2	3	31	Luminal	TP53-like	MS2b1	0	0	0	0	0	0	0	1	0	0	-1	0	-0.166	0.234	-0.208	0.35	-0.043	-0.15	-0.097	0.21	0.21	0.233	-0.266	-0.186
TCGA-DK-A3WW	Papillary		3	1	1	11	Basal	Basal	MS2b2.2	0	0	1	0	0	0	-2	0	0	0	0	0	0.767	-0.782	0.691	-0.309	-0.457	-0.205	-0.484	-0.427	-0.127	0.324	0.521	0.718
TCGA-FD-A5BZ	NA	NA		2	3	31	Luminal	TP53-like	MS2b1	0	0	0	0	1	1	-2	0	2	0	0	0	-0.142	0.225	-0.023	0.521	-0.087	-0.08	0.079	-0.02	0.05	0.252	-0.263	-0.2
TCGA-DK-A3IL	Non-papillary		2	2	3	31	Luminal	TP53-like	MS2a1	0	0	0	0	0	0	0	1	0	1	0	0	-0.363	0.654	-0.392	0.299	0.274	-0.026	0.231	0.404	0.253	-0.172	-0.455	-0.425
TCGA-DK-A6B2	NA	NA		2	3	31	Luminal	TP53-like	MS2a2	0	0	1	0	0	0	0	0	1	0	0	0	-0.191	0.513	-0.301	0.288	0.18	-0.152	0.001	0.194	0.321	0.258	-0.503	-0.323
TCGA-GV-A3JZ	Non-papillary		2	2	3	31	Luminal	Luminal	MS2a2	0	0	0	0	0	0	1	1	-1	0	0	2	-0.13	0.283	-0.217	0.038	0.133	-0.348	-0.136	0.461	0.495	0.078	-0.421	-0.136
TCGA-FD-A6TD	NA	NA		1	1	11	Basal	Basal	MS2b2.2	0	0	1	0	0	0	0	1	0	1	0	0	0.744	-0.774	0.632	-0.058	-0.516	-0.299	-0.564	-0.411	-0.037	0.47	0.493	0.693
TCGA-FD-A43X	NA	NA		2	2	22	Luminal	Luminal	MS1b	1	0	0	0	1	1	-2	0	0	0	0	0	-0.798	0.685	-0.463	-0.071	0.459	0.659	0.754	0.006	-0.474	-0.575	-0.16	-0.606
TCGA-BT-A42C	Papillary		1	2	2	21	Luminal	Luminal	MS1b	1	0	0	0	0	1	-2	0	2	0	-2	0	-0.749	0.72	-0.249	-0.165	0.475	0.241	0.537	0.198	-0.122	-0.553	-0.039	-0.397
TCGA-GV-A3QF	Papillary		1	2	2	21	Luminal	Luminal	MS2a1	0	0	0	0	0	0	-2	0	0	0	0	0	-0.826	0.866	-0.468	-0.144	0.561	0.08	0.457	0.46	0.178	-0.502	-0.289	-0.526
TCGA-FJ-A3ZE	Non-papillary		1	2	2	22	Luminal	Luminal	MS1b	1	0	0	0	0	0	-2	1	0	0	0	0	-0.313	0.389	-0.236	-0.231	0.401	0.288	0.417	0.252	-0.128	-0.574	-0.073	-0.298
TCGA-K4-A6FZ	NA	NA		1	1	11	Basal	Basal	MS2b2.1	0	0	0	0	0	0	0	1	0	1	0	2	0.22	-0.38	0.431	-0.191	-0.029	0.246	0.107	-0.364	-0.43	-0.121	0.502	0.168
TCGA-BT-A42E	NA	NA		1	1	11	Basal	Basal	MS2b2.2	0	0	0	0	0	0	-2	0	0	0	0	0	0.854	-0.832	0.701	-0.248	-0.433	-0.289	-0.504	-0.41	-0.044	0.334	0.474	0.757
TCGA-DK-A6B6	NA	NA		2	2	21	Luminal	Luminal	MS1b	0	0	0	0	0	0	0	1	0	0	0	0	-0.809	0.852	-0.504	-0.179	0.582	0.277	0.434	0.349	0.035	-0.325	-0.396	-0.643
TCGA-GU-A762	NA	NA		1	1	12	Basal	Basal	MS2b2.2	0	0	0	0	0	0	0	1	0	0	0	0	0.807	-0.809	0.617	-0.057	-0.617	-0.328	-0.61	-0.351	0.037	0.526	0.289	0.695
TCGA-G2-A2ES	Non-papillary		3	1	1	11	Basal	Basal	MS2b2.2	0	0	0	0	0	0	0	1	0	0	-1	0	0.796	-0.718	0.668	-0.23	-0.396	-0.153	-0.388	-0.461	-0.203	0.238	0.624	0.679
TCGA-CF-A47T	NA	NA		2	2	22	Luminal	Luminal	MS1b	0	0	0	1	0	0	-2	0	0	0	0	0	-0.748	0.876	-0.38	-0.047	0.477	0.47	0.696	0.065	-0.338	-0.564	-0.169	-0.502
TCGA-DK-A1AB	Non-papillary		3	1	1	11	Basal	Basal	MS2b2.2	0	0	1	0	0	0	0	1	0	0	0	0	0.859	-0.756	0.527	0.213	-0.513	-0.033	-0.415	-0.547	-0.306	0.437	0.491	0.584
TCGA-UY-A78N	NA	NA		2	3	32	Luminal	Luminal	MS2a1	1	0	0	0	0	0	0	1	0	0	-2	1	-0.515	0.711	-0.328	0.141	0.256	0.031	0.273	0.41	0.144	-0.313	-0.381	-0.34
TCGA-DK-A3IS	Papillary		1	2	2	22	Luminal	Luminal	MS1b	1	2	0	0	1	1	-1	1	0	0	0	0	-0.658	0.693	-0.305	-0.281	0.46	0.321	0.491	0.103	-0.236	-0.581	0.167	-0.306
TCGA-FD-A6TF	NA	NA		2	3	31	Basal	TP53-like	MS2b1	0	0	0	0	0	0	0	1	0	1	0	0	0.685	-0.677	0.272	0.354	-0.393	-0.4	-0.55	0.013	0.296	0.508	-0.061	0.363
TCGA-BT-A20P	Non-papillary		1	2	2	22	Luminal	Luminal	MS1b	0	2	0	0	0	1	-2	0	1	0	0	0	-0.484	0.45	-0.287	-0.073	0.194	0.401	0.452	0.009	-0.294	-0.431	0.066	-0.337
TCGA-E5-A4U1	NA	NA		2	2	21	Luminal	Luminal	MS1b	0	1	0	0	1	1	-1	1	0	0	0	0	-0.735	0.789	-0.441	-0.016	0.467	0.276	0.57	0.353	-0.016	-0.551	-0.337	-0.567

Supplementary table 7
Gene signatures used in Figures 1-2, Gene IDs are according to TCGA nomenclature
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CAD|790
COL17A1|1308
DSC2|1824
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KRT14|3861
KRT16|3868
KRT5|3852
LGALS7|3963
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MMP3|4314
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PI3|5266
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ANXA6|309
AOAH|313
AP1S2|8905
APOE|348
ARHGAP15|55843
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ARHGAP9|64333
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C1S|716
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CCL2|6347
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CD6|923
CD7|924
CD74|972
CD86|942
CLEC4A|50856

CORO1A|11151
CPVL|54504
CSF1R|1436
CST7|8530
CTLA4|1493
CTSK|1513
CYBB|1536
CYTH4|27128
CYTIP|9595
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DOCK11|139818
DOCK2|1794
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HLA-DQA1|3117
HLA-DRA|3122
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IFITM1|8519
IGSF6|10261
IKZF1|10320
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IL18BP|10068
IL18RAP|8807
IL2RA|3559
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IQGAP2|10788
IRF8|3394
ISG20|3669
ITGAL|3683
ITGAM|3684
ITGB2|3689
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LAT2|7462
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LYL1|4066
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MS4A4A|51338
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STAT4|6775
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TLR8|51311
TMEM176A|55365
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TNFRSF4|7293
TNFSF13B|10673
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GGT6|124975
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HPGD|3248
PKHD1|5314
PPARG|5468
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SNCG|6623
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ZNF385A|25946

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CDC25C|995
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CDCA8|55143
CDK1|983
CDKN3|1033
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STIL|6491
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COL8A1|1295
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PCSK5|5125
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PTRF|284119
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SERPINF1|5176
SGIP1|84251
SPARC|6678
SPON2|10417
SSC5D|284297
STX2|2054
SULF1|23213
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ABHD12|26090
ABHD14A|25864
ABI3BP|25890
ABL1|25
ACAA1|30
ACACB|32
ACADM|34
ACER2|340485
ACER3|55331
ACOT4|122970
ACOT7|11332
ACOT9|23597
ACOX1|51
ACOX2|8309
ACOXL|55289
ACP1|52
ACP5|54
ACP6|51205
ACPL2|92370
ACSBG1|23205
ACSF2|80221
ACSL1|2180
ACSL5|51703
ACSM3|6296
ACSS1|84532
ACTA2|59
ACTC1|70
ACTG2|72
ACTL6A|86
ACTN1|87
ACVR2A|92
ACVRL1|94
ADA|100
ADAM10|102
ADAM19|8728
ADAM23|8745
ADAMTS1|9510
ADAMTS9|56999
ADAP2|55803
ADARB1|104
ADCK2|90956
ADCY1|107
ADCY4|196883
ADCY6|112
ADH1A|124
ADH1C|126
ADHFE1|137872
ADK|132
ADORA2B|136
ADSS|159
AEBP1|165
AFAP1|60312

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AGFG1|3267
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AKR1C3|8644
AKTIP|64400
ALDH1A2|8854
ALDH1B1|219
ALDH2|217
ALDH4A1|8659
ALDH5A1|7915
ALDH7A1|501
ALDOA|226
ALOX12B|242
ALOX5|240
ALOX5AP|241
ALPK2|115701
AMACR|23600
AMOT|154796
AMT|275
ANGPTL2|23452
ANKDD1A|348094
ANKRD29|147463
ANKRD35|148741
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ANKRD6|22881
ANKS1A|23294
ANLN|54443
ANPEP|290
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ANTXR2|118429
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ANXA4|307
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AP1S2|8905
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APOL4|80832
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ASPM|259266
ASTN2|23245
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ATP1B3|483
ATP2A2|488
ATP2B4|493
ATP2C1|27032
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ATP8B1|5205
ATP8B2|57198
ATP8B4|79895
ATR|545
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BCL11B|64919
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BGN|633
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BICD2|23299
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C4orf34|201895
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C7orf58|79974
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C9orf116|138162
C9orf140|89958
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CALD1|800
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CHSY3|337876
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CLEC5A|23601
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CLIC6|54102
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CYFIP2|26999
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MAP2K1|5604
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MAPK13|5603
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