

Supplement S1 to S15

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S1. Transcript-Selection in Training-1.

Table S1 provides a summary of the 1,630 transcripts (Gene Symbol |ID) that distinguished nodal (stage IIIC) or distant (stage IV) endometrioid endometrial cancer (EEC) from stage I EEC. The relationship with metastasis was assessed using univariate logistic regression modeling with individual transcripts included as the explanatory variable. Statistical significance was set at $p < 0.05$. These loose criteria did not include correction for false-discovery. The coefficient, standard error and p-value for the individual transcripts in the univariate logistic regression model in the 75 cases in Training-1 were calculated using R and ranked in ascending order by p-value. The seven transcripts in the final MS7 classifier are bolded and highlighted in blue.

Table S1.			
	Univariate Logistic Modeling in Training-1		
GeneSymbol ID	Coefficient	Standard Error	P-value
FAM170A 340069	-0.982421987	0.256926531	0.000131439
PCDHGA1 56114	0.793237589	0.216812449	0.000253562
SNP3 26168	1.968204311	0.592258005	0.000889843
MAP2K1 5604	1.940295914	0.590608098	0.001018915
PTPLAD1 51495	1.271930639	0.390485902	0.001124766
WDR64 128025	-1.102892563	0.339107498	0.001144594
C6orf164 63914	-0.902868075	0.277984441	0.001162566
NLRP9 338321	-0.781259641	0.240830584	0.001178548
CDRT4 284040	-1.278540999	0.397193576	0.001286669
FGFR2 2263	-0.588564779	0.182869881	0.001288677
LUC7L 55692	-1.285625942	0.399464169	0.001289186
C14orf93 60686	-2.264781954	0.706795149	0.001353925
TXLNG 55787	1.398319103	0.437768485	0.0014022
ETF1 2107	2.189811489	0.688662405	0.001473747
CCDC130 81576	-1.349244648	0.425217714	0.001508373
ITIH3 3699	-0.861787013	0.271958704	0.001530614
FAM116B 414918	-0.890097745	0.281286077	0.001554105
TMEM22 80723	0.847209592	0.26776304	0.001556022
C12orf60 144608	-1.280096713	0.407682634	0.001689857
CDC16 8881	-2.38335072	0.762983958	0.001785783
ZNF688 146542	-1.171927148	0.37664338	0.001861373
HSCB 150274	-1.44194983	0.464713846	0.001916494
RSRC1 51319	1.076378266	0.349321336	0.002060703
CROCC 9696	-1.175205311	0.381538368	0.002068783
ZNF528 84436	-0.864922982	0.282358167	0.002189747
C22orf43 51233	-0.66377434	0.216946365	0.002216149
EIF2S2 8894	2.4444906	0.799169617	0.002222342
ZFP36L2 678	-1.085996313	0.355403649	0.002245582
KIAA0196 9897	1.378963942	0.452171369	0.00229109
WFDC8 90199	-0.518410872	0.170159736	0.002314354
PCDHAC2 56134	0.435401841	0.143140361	0.002351818
IFT27 11020	-1.038539502	0.342170687	0.002404158
MED14 9282	1.58992677	0.526277277	0.002518732

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TTC21A 199223	-0.61150961	0.202621488	0.002544574
TRIM50 135892	-0.727374357	0.241131334	0.002557053
PCDHGA3 56112	0.50133265	0.166319307	0.002575915
RGP1 9827	0.92836827	0.30818057	0.002591766
KRTAP5-10 387273	-0.575230285	0.191016959	0.002600379
TRPM4 54795	-0.801324535	0.266443867	0.002634237
CUBN 8029	-0.670190963	0.223496504	0.00271166
C12orf27 283460	-0.497602388	0.16631263	0.002771836
C6orf70 55780	-1.343978471	0.449406227	0.00278462
LOC143188 143188	-1.051539976	0.353047656	0.002896964
H2AFB1 474382	-0.690404065	0.231818363	0.00289936
STX19 415117	-0.491387137	0.165221824	0.00293844
LRP5L 91355	-0.883576558	0.297096135	0.002939043
LTB4R2 56413	-1.194213211	0.40236277	0.002997431
FAM53A 152877	-0.783599818	0.264278174	0.00302627
ETS2 2114	-1.013874261	0.341943037	0.003026451
DDX24 57062	2.045308488	0.690166494	0.003041619
LRRC27 80313	-1.075726979	0.363701493	0.003099241
COL28A1 340267	-0.494862157	0.168241873	0.003267605
CPT1B 1375	-0.742175709	0.252806702	0.00332749
LOC728743 728743	-0.855069603	0.291736702	0.003379126
CYP2E1 1571	-0.463931683	0.158319084	0.003385711
EPR1 8475	0.371561531	0.126969347	0.003429233
GLTSCR2 29997	-1.189119883	0.406577155	0.003447784
CALB1 793	0.326243716	0.112325309	0.00367894
ACAD11 84129	-1.093019317	0.376551714	0.003699525
C2orf81 388963	-0.797873789	0.274949647	0.003709181
YWHAB 7529	1.982233869	0.683123017	0.003711164
QRICH1 54870	2.071723288	0.714366268	0.003730608
SPINLW1 57119	-0.349450322	0.120671767	0.003781033
PSMD8 5714	2.015838567	0.696658302	0.003808737
NAA50 80218	1.353336806	0.468130756	0.003840944
C1orf228 339541	-0.636870844	0.220441134	0.003863776
WASH3P 374666	-1.093429572	0.378579412	0.003873997
TNIP2 79155	-1.653868558	0.572660759	0.003876476
OR2A9P 441295	-0.855813307	0.297000837	0.003957644
PAFAH1B1 5048	2.153832642	0.747795199	0.003973675
GSK3B 2932	1.637249367	0.568730007	0.003992149
CCDC88A 55704	0.611716339	0.212493479	0.003992503
CCDC57 284001	-1.034090182	0.359828509	0.004055121
UROS 7390	-1.508525093	0.525746173	0.004113774
GFM1 85476	1.371378736	0.478236649	0.004136327
SKINTL 391037	-0.60081653	0.20972749	0.004173405
C19orf18 147685	-0.502137642	0.175393039	0.004197459
LRRC42 115353	1.199760176	0.419801654	0.004264259
C2CD2 25966	-1.403602701	0.491791836	0.004316457
MRPL49 740	1.652329193	0.579212612	0.004334732
MRPL13 28998	1.514230569	0.531496211	0.004385743
C1orf101 257044	-0.684851334	0.241637366	0.004593896
TFRC 7037	0.698434467	0.246530417	0.004610531
DLST 1743	1.64423539	0.580976275	0.004652984
RCE1 9986	1.975754163	0.700622986	0.004802422
LIMS3-LOC440895 100271835	-0.376410775	0.133662541	0.004860635
PSMA7 5688	1.589054407	0.564992719	0.004915467
TUBB1 81027	1.063101405	0.378246052	0.004944798
C1orf152 767846	-0.664736112	0.236810482	0.004999928
PRKDC 5591	0.789129557	0.281167047	0.005006399
XPO5 57510	1.509810148	0.538056348	0.005015374
SF3B2 10992	2.255184461	0.804148917	0.005040464

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TMED6 146456	-0.373200503	0.133132484	0.005059413
IMPA2 3613	1.004867027	0.358946236	0.005118312
PCOLCE2 26577	0.325941037	0.116478265	0.00513725
HCG2P7 80867	-0.546707137	0.195383884	0.005140135
ATP5B 506	1.199247511	0.429046266	0.005187607
TBC1D3C 414060	-0.671268073	0.240233863	0.005202386
ARFGEF1 10565	1.350108207	0.483408831	0.005223928
F2R 2149	0.891570816	0.319935012	0.005324368
LDLRAD2 401944	-0.543043223	0.195003613	0.005356315
C4orf44 345222	-0.769100355	0.27626619	0.005370785
SMURF1 57154	1.711172299	0.616907003	0.005540693
PRPS1 5631	1.32913695	0.480010338	0.005623283
CCDC94 55702	-1.266959761	0.458019722	0.005671921
FAM193A 8603	-1.889907301	0.683323078	0.00567904
RP1L1 94137	-0.439834736	0.159194702	0.005729506
SUGT1L1 283507	-0.672547644	0.24348655	0.005742117
IL20 50604	-0.577127616	0.20895709	0.005745847
GIYD2 79008	-0.906487428	0.328394804	0.005773794
MLLT10 8028	1.2737948	0.461897122	0.005820146
C19orf25 148223	-1.211931885	0.439583974	0.005833481
KLK2 3817	-0.450047779	0.163398515	0.005881865
TBRG1 84897	-1.38213156	0.501816448	0.005882552
C17orf108 201229	-0.943897422	0.342907574	0.00591188
NUP155 9631	0.818638966	0.297434868	0.005917282
CHKB-CPT1B 386593	-0.744554132	0.270525062	0.00591863
PRMT5 10419	1.180618543	0.430303084	0.006075276
CYP2D6 1565	-0.488950833	0.178259277	0.006089563
FES 2242	-0.879643778	0.320947085	0.006129445
RAB5C 5878	1.216422478	0.443874523	0.006135236
SPPL2B 56928	-1.158302888	0.422926669	0.006166772
HNF1A 6927	-0.404351868	0.147721094	0.006195225
TEKT3 64518	-0.42149351	0.15406976	0.006224177
CIRBP 1153	-1.275656478	0.466311345	0.006226051
YME1L1 10730	1.375341617	0.502769264	0.006227945
CYP2C8 1558	-0.446859379	0.163404987	0.006244207
CYP21A2 1589	-0.412778069	0.151236034	0.006345677
WASH2P 375260	-1.104644476	0.40495244	0.006375099
OCM 654231	-0.688673201	0.252560081	0.006395764
SLC25A4 291	1.358966833	0.498410387	0.006399014
DPM1 8813	1.199471452	0.440540272	0.006474529
PCYOX1 51449	1.466206142	0.53852996	0.00647688
PCDHGA2 56113	0.445815248	0.163749084	0.006478002
MMGT1 93380	1.017305873	0.373730391	0.006488197
CDK4 1019	1.55621756	0.571730346	0.006489929
DDX27 55661	1.755938746	0.645322493	0.006507981
DDX21 9188	0.712793704	0.26199741	0.006516089
CCDC101 112869	-1.193000393	0.438539734	0.006520438
PNP 4860	1.295430276	0.476329552	0.006535909
HEXDC 284004	-0.971106772	0.357153785	0.006547649
ZNF446 55663	-1.310860288	0.48219978	0.006557858
FLJ39609 100130417	-0.41560041	0.152893504	0.006563129
UBQLNL 143630	-0.441962158	0.162619416	0.006572352
MST4 51765	0.531688942	0.19597959	0.006668089
DACT2 168002	-0.392080717	0.144605732	0.006700431
VILL 50853	-0.661010986	0.244007751	0.006749135
RNF135 84282	-1.511730926	0.558068518	0.00675143
C3orf26 84319	1.160118573	0.428275949	0.006752481
DHX36 170506	1.195369139	0.441474094	0.006775598
DNAJA3 9093	1.709957132	0.631548163	0.006777898

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CCDC33 80125	-0.340673028	0.125910941	0.006816745
GLOD4 51031	1.73535212	0.641397968	0.006818567
HSD11B1L 374875	-0.941252777	0.347975558	0.00683169
IDUA 3425	-0.640921253	0.237032954	0.006852408
MZF1 7593	-0.895177496	0.331070173	0.006853287
CROCCL1 84809	-1.199894171	0.444132904	0.006899518
PCMT1 5110	1.58927589	0.588632714	0.006935096
SNRNP35 11066	-1.141811442	0.423091209	0.006960338
WDYHV1 55093	1.358411448	0.503382896	0.006963914
WASH5P 375690	-1.156970229	0.428988814	0.006997344
MRPL37 51253	1.595857579	0.592369533	0.007059514
SGCE 8910	0.512972756	0.190457365	0.007073305
FAM111A 63901	-1.268304351	0.47091091	0.007074858
ZNF10 7556	-0.933163492	0.346590043	0.007093707
ZNF140 7699	-1.285322946	0.478118635	0.007181836
AQP2 359	-0.468213453	0.174167806	0.007181914
WDR61 80349	1.659518798	0.617360423	0.007186258
COL18A1 80781	-0.845828665	0.314924093	0.007235258
GOLGA8F 100132565	-0.695660331	0.259022464	0.007237495
VAT1 10493	0.905489612	0.337237484	0.007252532
EIF4A3 9775	1.381909959	0.515413853	0.007336617
GPR113 165082	-0.860755513	0.321375618	0.007398646
NOXA1 10811	-0.583665004	0.218048707	0.00743369
GART 2618	1.223982334	0.45748492	0.007462691
KIAA1161 57462	0.610194196	0.2280758	0.007463994
FOXD1 2297	0.424181585	0.158566178	0.007470528
PSMD1 5707	1.615555163	0.603940413	0.007472388
ASB9 140462	0.723320219	0.270491997	0.007493211
NDUFS1 4719	1.190948482	0.445404375	0.007498398
ELMOD3 84173	-1.505897613	0.563274572	0.007507101
ERAP2 64167	-0.343767644	0.128694517	0.007558261
PDE9A 5152	-0.822888864	0.308209652	0.00758739
TTC9C 283237	1.907349611	0.714578958	0.00760336
TMX2 51075	1.605359697	0.601826912	0.007642302
NPDC1 56654	-0.612443039	0.229628947	0.007650923
NEUROD2 4761	-0.616798368	0.231343045	0.007672238
EIF2B3 8891	1.971696179	0.740681324	0.00776771
NPIPL3 23117	-0.557573616	0.209732175	0.007848865
USH2A 7399	-0.451970209	0.170015014	0.00785095
FAM193B 54540	-1.000218622	0.376331866	0.00786502
C9orf84 158401	-0.438515485	0.16532764	0.007992115
BDNFOS 497258	-0.736747975	0.278626399	0.008188074
PDZK1P1 728939	-0.376128955	0.14228824	0.008207081
MAN2A1 4124	0.630856484	0.238787921	0.008243967
LOC284900 284900	-1.110088411	0.420436307	0.00828266
TXNRD2 10587	-1.042767013	0.395292534	0.008340572
MRPL33 9553	1.06823752	0.404984777	0.008346481
PRIM1 5557	0.699848305	0.265415615	0.008369178
PTPN18 26469	-0.993304953	0.376999333	0.008419535
SLC35E2 728661	-1.768533935	0.671282828	0.008424677
LDLR 3949	0.715178001	0.271486443	0.00843098
C8orf79 57604	-0.387423797	0.147080284	0.008436128
SLC22A23 63027	-0.944467766	0.358638595	0.008451467
MUSTN1 389125	-0.519885445	0.197435946	0.008458817
FGF1 2246	-0.471812174	0.17919094	0.008463097
IDI1 3422	1.051853889	0.399646812	0.008489419
DERL1 79139	1.956794399	0.743669779	0.008506696
LMF1 64788	-0.77058638	0.292887687	0.0085135
MYH3 4621	-0.544643403	0.207121451	0.008548923

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PYY 5697	-0.246407162	0.093804931	0.008619098
THOC4 10189	1.102506054	0.419800872	0.008632896
C22orf27 150291	-1.11046522	0.423022173	0.008662971
JMJD7-PLA2G4B 8681	-0.843401064	0.321591944	0.008726641
F10 2159	-0.597374991	0.227963037	0.008780336
CLSPN 63967	0.550164199	0.210030906	0.008807323
ARRDC4 91947	-0.791941928	0.302403379	0.008823286
FERMT2 10979	1.098437378	0.419650604	0.00885753
ZMAT2 153527	1.86700656	0.713460581	0.008874998
PPIL1 51645	1.23768419	0.472978893	0.008876217
AP2B1 163	1.662462086	0.635367693	0.008882714
PPT2 9374	1.470047442	0.561865164	0.008887007
CCDC48 79825	-0.589868257	0.225490801	0.008898468
SLC5A9 200010	-0.479225627	0.183317176	0.008943971
PDLIM3 27295	0.383761369	0.14682369	0.008955284
MTHFSD 64779	-1.470813932	0.562870429	0.008973567
ZNF596 169270	-0.955900968	0.365965521	0.009001495
MBTPS2 51360	1.182791064	0.453001318	0.00902752
USP9X 8239	1.379474602	0.528439854	0.009041879
WFDC6 140870	-0.323278693	0.123847595	0.009046431
ZSCAN4 201516	-0.636103185	0.243872693	0.009098222
LOC390595 390595	-0.708518609	0.271836711	0.009149619
UCP3 7352	-0.774568465	0.297299989	0.009178231
RABEP2 79874	-1.158576461	0.44471962	0.009182492
CUL2 8453	1.500654387	0.576051012	0.009185494
CIRH1A 84916	1.633674984	0.627506671	0.009229384
PDZK1 5174	-0.321974639	0.123706556	0.009248503
MGC42105 167359	-0.454924723	0.174802463	0.009254479
VPRBP 9730	1.18917315	0.456996609	0.009264166
NANOG 79923	-0.53132168	0.204330231	0.009313993
TNFRSF10A 8797	0.589626849	0.226756407	0.009315167
RPS6KA3 6197	0.961586603	0.369826278	0.009319564
C4orf31 79625	-0.430159807	0.165471457	0.009333214
STRAP 11171	1.211217733	0.466084873	0.009357578
TNFSF12-TNFSF13 407977	-0.547377587	0.210729394	0.009389476
LOC730101 730101	0.588586803	0.226722031	0.00942962
HOXD13 3239	0.399495199	0.153914777	0.009443663
CSNK2A1 1457	1.335788329	0.514866377	0.0094746
GTPBP4 23560	1.427071368	0.550071072	0.009477272
NMRAL1 57407	-1.060329365	0.408727102	0.00948049
LOC219347 219347	-0.652103734	0.25142302	0.009496265
PLS1 5357	0.608026339	0.234604254	0.009550006
ZNF137 7696	-0.887284682	0.342378493	0.009554977
RHBDD3 25807	-1.104831203	0.426532188	0.00959022
UBQLN1 29979	1.491286737	0.576483423	0.009685258
INO80E 283899	-1.34247286	0.519015795	0.00969353
ZNF582 147948	-0.545019898	0.210858763	0.0097446
PLGLB2 5342	-0.683372974	0.264516172	0.009780835
RRAGC 64121	0.606486722	0.234850186	0.009810417
TMEM219 124446	-1.471546239	0.570028676	0.009836339
ETFA 2108	1.216318447	0.471170988	0.009837771
RPL18 6141	-0.984095079	0.381377647	0.009869478
FOLH1 2346	-0.544826214	0.211365981	0.009947648
HSF5 124535	-0.655936713	0.254507862	0.009958273
ADRBK2 157	-0.904992815	0.351145118	0.009958656
DSCR3 10311	1.500932073	0.582450306	0.009968292
CORO1C 23603	1.204495932	0.467541125	0.009988266
APOL4 80832	-0.465935125	0.181133144	0.010101509
MED30 90390	1.331936664	0.517905113	0.010117792

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RNF19B 127544	0.825633638	0.321114386	0.010136106
PTPN20B 26095	-0.387278452	0.150656266	0.010151968
RPL32P3 132241	-1.011034971	0.393339903	0.010158556
PIP4K2C 79837	1.339626681	0.521559469	0.010213904
RPL13 6137	-0.868883378	0.338334491	0.010225192
CYTH2 9266	-1.385225599	0.539512703	0.010242015
SIGIRR 59307	-0.931011521	0.362755912	0.010273187
DVL2 1856	1.281872806	0.499676098	0.01030547
SCD 6319	0.69767617	0.271983948	0.010313498
TAF1C 9013	-1.291682991	0.503862606	0.010360422
IFT52 51098	1.262046127	0.492400412	0.010375756
FAM114A1 92689	0.8323391	0.324961598	0.010426745
EBNA1BP2 10969	1.408109819	0.549894105	0.010446371
CALU 813	1.137786352	0.444342769	0.010449006
ANKK1 255239	-0.406654831	0.158897718	0.010490616
APOBEC2 10930	-0.661285326	0.25853285	0.010532494
TAF2 6873	0.958958449	0.37510964	0.010573864
SH3BP2 6452	-1.1237278	0.439866008	0.010627789
LOC100133612 100133612	-0.557668917	0.218328228	0.010641116
NCRNA00174 285908	-0.685108167	0.268462304	0.010711526
ECT2L 345930	-0.542946525	0.213040959	0.010817034
RPL28 6158	-0.920814466	0.361510231	0.010861218
MCM4 4173	0.629742843	0.247279945	0.010875317
PLA2G6 8398	-0.788846422	0.309926376	0.010919316
SENP2 59343	1.074963502	0.42235464	0.010922518
C20orf134 170487	-0.510332045	0.200585874	0.010952606
ZNF541 84215	-0.342363806	0.134640185	0.010996641
TMEM114 283953	-0.404460182	0.15913034	0.01103176
WISP1 8840	0.510489188	0.200863544	0.011038661
ZBED5 58486	-1.308915426	0.515047401	0.011042549
HOXB13 10481	-0.220928601	0.086956887	0.011064085
GSTA1 2938	0.2456904	0.096785189	0.011132486
WDR44 54521	0.94400139	0.371977311	0.011155397
DYSFIP1 116729	-0.525795166	0.207491585	0.011275091
SLC26A4 5172	-0.424412527	0.167543815	0.011304466
CPNE3 8895	1.475164405	0.582572583	0.011336369
VKORC1L1 154807	1.397381578	0.551882286	0.011340483
SFRS2B 10929	-1.278118474	0.50488548	0.011357525
EXD1 161829	-0.655718984	0.259061938	0.011369627
MTFR1 9650	1.169373125	0.462046143	0.011378394
P2RY11 5032	-0.707904989	0.279861776	0.011423142
UBQLN2 29978	1.401763241	0.554285335	0.011440236
KIAA1279 26128	1.387802127	0.548793447	0.011444535
LRRC48 83450	-0.400503928	0.158409968	0.01146246
P4HB 5034	-1.34164885	0.530762387	0.01147873
UBP1 7342	1.510863123	0.597727253	0.0114819
HOXA13 3209	0.394429652	0.156072676	0.011497016
GMCL1 64395	0.79776044	0.315751775	0.011519128
ADAM22 53616	0.422799341	0.16735844	0.011526764
HDAC3 8841	1.395081308	0.55230467	0.011539344
NCRNA00167 440072	-0.654368706	0.259170191	0.011574406
ZFP2 80108	-0.763003664	0.302302591	0.011603675
PCP2 126006	-0.381413519	0.151250409	0.011677749
NR1H2 7376	-1.349429636	0.535300688	0.011706125
TTC16 158248	-0.464311976	0.184228744	0.011725436
FLJ42627 645644	-0.612606333	0.243098484	0.011735737
NCRNA00204B 286967	-0.503878404	0.200144791	0.011816768
C1orf175 374977	-0.409291651	0.162592268	0.011826194
LOC387646 387646	0.616088093	0.244744846	0.011826921

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ATP6V1H 51606	1.611073328	0.640787021	0.011929927
ZNF862 643641	-0.766497189	0.304916898	0.011944138
PPP2R5D 5528	1.805303955	0.71828562	0.011959025
METTL1A 28989	1.131998946	0.450423965	0.011964643
TMEM38B 55151	0.496145341	0.197479027	0.011991475
MAPRE1 22919	1.48713065	0.592000479	0.012003447
CECR1 51816	-0.44043259	0.175338356	0.012008278
SRPK1 6732	1.073118351	0.427399401	0.012045478
SLC37A4 2542	-1.527440837	0.608421512	0.012056109
LAMA1 284217	-0.297454631	0.118504186	0.012070484
GTF2E1 2960	1.384776416	0.551766638	0.0120829
SMCR5 140771	-0.591659691	0.235810846	0.012105855
FAM18A 780776	-0.850212667	0.338885805	0.01211259
PEG10 23089	0.259736424	0.103547954	0.012129011
ZNF623 9831	1.086076092	0.433006179	0.012134004
HAT1 8520	0.896055841	0.357319434	0.012151412
WBSCR17 64409	-0.298462864	0.11912231	0.012227284
OCA2 4948	-0.24929874	0.099542696	0.01226453
SLC22A18 5002	-0.578891058	0.231359647	0.012344988
MAP2K5 5607	1.295651769	0.517893166	0.01235727
CCT4 10575	1.13352001	0.453165213	0.012372454
CSAD 51380	-0.721669378	0.288548935	0.012383289
CCDC159 126075	-0.66822706	0.267248148	0.012405342
AMY1A 276	-0.235026797	0.09400097	0.012410245
LOC646982 646982	-0.568560612	0.227484779	0.012442672
PATZ1 23598	-1.71897461	0.687903756	0.012459381
ATP6V1C1 528	1.496468052	0.599014972	0.012482055
C17orf93 360205	-0.23917772	0.095741135	0.012483599
LMOD3 56203	-0.586142097	0.23469326	0.012507896
AGXT2L2 85007	-1.081256665	0.433110414	0.012542851
RFC1 5981	1.202375626	0.481685836	0.012553809
SLC9A11 284525	-0.549986235	0.220439061	0.012597198
C3orf32 51066	-0.448357215	0.179838784	0.012663091
AMY2B 280	-0.388575798	0.155881297	0.012675189
TNPO3 23534	1.053749765	0.423198301	0.012775499
GPN1 11321	1.571669093	0.631242736	0.012781447
WASH7P 653635	-0.973063656	0.391078351	0.012840766
LCA5L 150082	-0.685080211	0.275413562	0.012865893
KTI12 112970	1.617925288	0.650600679	0.012889143
DFNB59 494513	-0.586955366	0.236259101	0.012978035
PRPF8 10594	1.17755405	0.474056079	0.012991677
AES 166	-1.041595276	0.419348787	0.012997421
APBB3 10307	-0.882461953	0.355340205	0.01301245
C20orf24 55969	1.522833734	0.613248472	0.013019894
MAP6 4135	-0.390394566	0.157232106	0.013031076
SP2 6668	1.060853496	0.427397726	0.013060238
LRRC20 55222	0.883500511	0.355999111	0.013073925
GSPT1 2935	1.415338621	0.5705098	0.013107636
DPH2 1802	1.554764809	0.62673343	0.013110872
SPATA20 64847	-0.837705839	0.337795183	0.013141098
CACNA1I 8911	-0.285742133	0.115245529	0.013159604
C1orf157 284573	-0.404995255	0.163348673	0.013162949
AGAP6 414189	-0.669688315	0.270150092	0.013177013
DDX46 9879	1.134387419	0.45771137	0.013197669
CDK2 1017	0.916780127	0.370064632	0.013236152
LOC729799 729799	0.462493508	0.186697916	0.013240688
KCNQ1 3784	-0.477285213	0.192855064	0.013329629
SNORA25 684959	-0.45432193	0.183594523	0.013338767
ARFGAP2 84364	-1.934026745	0.781577864	0.013341693

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FOXD4L3 286380	-0.487907765	0.197178032	0.013344039
GTF3C4 9329	0.738563747	0.298545049	0.013365568
STX18 53407	-0.476671377	0.192776166	0.013410882
AFG3L2 10939	0.906694606	0.366749942	0.013426859
ANKRD49 54851	-0.975418488	0.394937203	0.013518614
C6orf153 88745	1.756545578	0.711324267	0.013533908
ZFP64 55734	1.055229317	0.427372944	0.01354509
ZNF415 55786	-1.041123487	0.421725187	0.01355954
C8G 733	-0.485171462	0.196530165	0.013560978
SNRNP40 9410	0.962262735	0.38993832	0.01359726
FAM195B 348262	-1.083841153	0.439285102	0.013614229
GRM6 2916	-0.45346196	0.183810848	0.013624912
CLUL1 27098	-0.374023437	0.151682115	0.013669336
CSDE1 7812	1.813552108	0.735515749	0.013675052
NCRNA00110 642976	-0.450944375	0.182896021	0.013679245
RPA1 6117	1.07383519	0.435572382	0.013688226
LHB 3972	-0.443395581	0.179972346	0.013751603
RCBTB2 1102	-0.978385381	0.397213384	0.01377327
FAM83C 128876	-0.389429071	0.158247054	0.013859168
XRN2 22803	1.026548125	0.417349238	0.013905858
PARG 8505	0.985039767	0.400591651	0.013933925
JMJD6 23210	1.493685673	0.607463067	0.013936679
CSNK2A1P 283106	0.652992255	0.26579138	0.014018659
PTPLB 201562	0.422797506	0.172114776	0.014030334
PLB1 151056	-0.472187129	0.192247888	0.014043965
TMEM220 388335	-0.594796783	0.24217745	0.014047869
FBXW4 6468	-1.016333757	0.413850055	0.014057062
AMY2A 279	-0.330590402	0.134619106	0.014059228
STAC3 246329	-0.652330308	0.265917971	0.014162069
LOC100288778 100288778	-0.831368748	0.338954423	0.014177082
ZNF32 7580	-1.072619108	0.4373616	0.014187659
PARD3 56288	1.103623686	0.450258229	0.014242412
SCAPER 49855	0.940632294	0.383827702	0.014259344
MAPK14 1432	1.632016584	0.665949873	0.014259465
ALDH16A1 126133	-1.372866259	0.560318374	0.014279516
STAR 6770	-0.474090355	0.193526915	0.014295996
HSPA14 51182	1.103791578	0.450913228	0.014369057
GPRC5B 51704	0.493059633	0.201451443	0.014383681
CASK 8573	1.18365413	0.483626262	0.014386858
ZSWIM7 125150	-1.268949521	0.51850547	0.014392244
CYP2D7P1 1564	-0.591770836	0.241924775	0.014441319
MUT 4594	1.060779379	0.433903724	0.014495883
GANAB 23193	1.310525834	0.536245129	0.014529726
TBC1D3B 414059	-0.675282108	0.276480524	0.014589083
COPS4 51138	1.183153748	0.484612097	0.014628619
NUP93 9688	1.384179785	0.567321815	0.014693386
LDLRAP1 26119	-1.231415278	0.504812042	0.014713547
RALBP1 10928	1.37277465	0.562780659	0.014716919
ZNF193 7746	-0.998952301	0.409535025	0.01471838
RASL10B 91608	0.512595133	0.21021346	0.014750376
CHADL 150356	-0.464592742	0.19053176	0.014752419
ACCS 84680	-0.621644236	0.254954467	0.014758322
FXR2 9513	1.401090357	0.574747577	0.01477903
NADSYN1 55191	-1.007102406	0.413180069	0.014791592
C3orf62 375341	-1.056633477	0.433558996	0.014804938
TTC23 64927	-1.265000444	0.519123764	0.0148179
LRRC56 115399	-0.629994801	0.258681277	0.014874951
TRA2A 29896	-1.191713435	0.489378679	0.01488537
ATHL1 80162	-0.376501976	0.154719135	0.014955515

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C6orf97 80129	-0.332024119	0.136460824	0.014969776
ZNF787 126208	-1.059290796	0.435400802	0.01497804
CBARA1 10367	1.962282849	0.806579319	0.014980692
SFXN1 94081	1.383621975	0.568751842	0.014985303
ITGB3 3690	0.396015004	0.162823442	0.01500848
LINGO4 339398	-0.336334045	0.138341424	0.015049393
EGFL8 80864	-0.507651705	0.20882921	0.015059624
CHRNA10 57053	-0.65683733	0.270254536	0.015080519
MPHOSPH8 54737	1.178861133	0.485228917	0.015119882
C6orf217 100131814	-0.475495945	0.195754309	0.01513867
SCN11A 11280	-0.455839937	0.187733004	0.015176947
LOC100130872 100130872	-0.533678142	0.219801514	0.015182331
KLKB1 3818	-0.304715942	0.125520388	0.015198212
BAZ2A 11176	1.350208834	0.556638496	0.0152811
FAM83D 81610	0.553178531	0.228061687	0.015284563
C1orf159 54991	-1.007305147	0.415448114	0.015324282
GJC1 10052	0.57600882	0.237576715	0.015328759
SLC39A2 29986	-0.306885106	0.126607881	0.015354745
MCM2 4171	0.659306939	0.272002996	0.015355007
FAM108B1 51104	0.986791058	0.407171774	0.015370686
BMF 90427	-0.755347371	0.311722358	0.015386934
USP17 391627	-0.431088933	0.177920496	0.015395887
LTB4R 1241	-0.52022041	0.214715836	0.015400045
PTGDS 5730	-0.344090436	0.14203124	0.015408225
SEC16B 89866	-0.424392389	0.175188145	0.015414342
ZBTB48 3104	-1.164050231	0.480588231	0.015429559
ANAPC4 29945	-0.553860826	0.228774228	0.015478171
EFTUD1 79631	1.135034759	0.468874429	0.01548789
HOXD1 3231	0.332784832	0.1375877	0.015575626
YRDC 79693	1.479765745	0.611846747	0.015583638
TMEM65 157378	0.803014515	0.332131475	0.015616332
ATP6V1A 523	1.242402571	0.513964172	0.015636377
ESYT2 57488	1.359937851	0.56264773	0.01564762
SNX30 401548	0.81267782	0.33624411	0.015652111
SIRT6 51548	-1.322745805	0.547670745	0.015725671
NUP205 23165	0.981091264	0.406240922	0.015733143
LPAL2 80350	-0.443965053	0.183856949	0.01574684
SERINC2 347735	-0.488133395	0.202151944	0.015748796
KLHL17 339451	-0.769782033	0.319197506	0.015881969
AGPAT9 84803	0.456555445	0.189409728	0.015934523
ORM1 5004	-0.188751936	0.078333147	0.015969803
HSF4 3299	-0.463680867	0.192490387	0.016002783
CPNE7 27132	-0.339645137	0.141083672	0.016066466
CISD1 55847	1.36037268	0.56526829	0.01610195
C20orf177 63939	0.671800743	0.279303652	0.016160513
PJA1 64219	0.781310748	0.324920807	0.016189334
METTL2A 339175	1.428039053	0.594167651	0.016242174
CLCN2 1181	0.812002812	0.337928709	0.016266435
SOAT2 8435	-0.44145263	0.183767486	0.01629525
PILRB 29990	-0.698516651	0.290797094	0.016302332
NUP85 79902	1.46742051	0.611649462	0.016434524
CCDC84 338657	-0.739096325	0.308170235	0.016469669
RPS9 6203	-1.047582708	0.436913121	0.016498772
PTPN1 5770	1.289147033	0.537676183	0.016501651
MPG 4350	-1.143741785	0.477033311	0.016502241
PLCH2 9651	-0.384112244	0.160333175	0.016588081
EIF5 1983	1.400044048	0.584470298	0.01660194
C10orf68 79741	-0.453434606	0.189388739	0.016656642
SRP14 6727	-1.281948	0.535577074	0.016684721

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DCST2 127579	-0.392176972	0.163891589	0.016715577
CDR2L 30850	0.877289244	0.366654172	0.016725431
SLC4A1 6521	-0.411860725	0.172152533	0.016737792
IHH 3549	-0.166854448	0.069752725	0.016752961
HSN2 378465	0.628245415	0.262707519	0.016783098
LOC90246 90246	-0.399249168	0.166966603	0.016793778
SLC25A5 292	0.792638571	0.331649109	0.01684876
CHAC2 494143	0.61636098	0.258040405	0.016911694
JMJD5 79831	-1.181068779	0.494620019	0.016948155
FRYL 285527	-1.092586972	0.457748981	0.016992533
ABHD3 171586	0.822987131	0.344862542	0.017013273
PTHLH 5744	0.452266947	0.189528237	0.017019908
FAM22A 728118	-0.674728527	0.28276048	0.017022595
ABCG5 64240	-0.491868164	0.20622157	0.017072432
EIF4EBP3 8637	-0.651037961	0.27297502	0.017080391
BCHE 590	0.317060189	0.132987565	0.017119363
HSPA1A 3303	0.656387798	0.275329293	0.017125135
RACGAP1 29127	0.675872444	0.283535928	0.017138279
LOC91316 91316	-0.667757276	0.280185412	0.017159639
KIAA1683 80726	-0.385841411	0.162031262	0.017252706
RIOK1 83732	1.242004865	0.521821421	0.017306347
PYCARD 29108	-0.553600798	0.232664127	0.017340893
TCP1 6950	1.410755072	0.593064133	0.017371154
LRRN4CL 221091	-0.421087834	0.177022153	0.017372415
PGAM5 192111	0.783706059	0.329465047	0.017372729
RAPSN 5913	-0.404378028	0.170007132	0.017378782
RNF167 26001	1.810526506	0.761245711	0.01738921
TCEB1 6921	1.573861182	0.661744839	0.017390286
LOC100144604 100144604	-0.264717697	0.111303822	0.017391052
JPH1 56704	0.336651763	0.141562127	0.01740115
SAMD4B 55095	1.054951978	0.443734338	0.017433256
EIF4G1 1981	1.103712085	0.464279473	0.017441884
EIF1B 10289	0.932436342	0.392414809	0.017494362
CCNL2 81669	-0.763906115	0.321718744	0.017574962
FLJ40852 285962	-0.610544279	0.257134872	0.017576897
SLC35B2 347734	1.161175824	0.489067719	0.017583978
TINF2 26277	1.474039501	0.621052949	0.017622673
PEX26 55670	0.745997279	0.314411794	0.017659753
PRKG2 5593	0.376535877	0.15872377	0.017679094
C20orf151 140893	-0.535779486	0.225871234	0.017689352
AADACL4 343066	-0.425823018	0.179523715	0.01769402
C17orf48 56985	-1.233702953	0.520287981	0.017730794
STOML2 30968	1.440692836	0.607601213	0.017734474
MAP4 4134	1.531412941	0.645920488	0.017744827
POLR1A 25885	0.986433681	0.416111769	0.017759341
TIAF1 9220	-0.689495374	0.290928538	0.017788955
RPP14 11102	1.546131234	0.65242827	0.017797214
PGK1 5230	0.643690887	0.271814044	0.017878271
KDM6A 7403	0.839140288	0.354461949	0.017915326
SRPX 8406	0.426631199	0.1802675	0.017949597
ELP3 55140	-0.520071456	0.219836212	0.01799493
GUSBP1 728411	-1.088383686	0.460383866	0.018074973
RSAD1 55316	-1.300278285	0.550189919	0.018111717
SLC25A34 284723	-0.510963977	0.216228079	0.018123818
DHX58 79132	-0.6060943	0.256544473	0.018150618
POLM 27434	-1.384069677	0.586364175	0.018253923
SNX12 29934	0.671483803	0.284659869	0.018329257
NCRNA00093 100188954	-0.438603273	0.185995484	0.018366796
TARBP1 6894	-0.705160215	0.299049242	0.018373345

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SSRP1 6749	1.12169093	0.475716329	0.018378706
IL32 9235	-0.427665933	0.181379117	0.018380796
ARMC1 55156	0.975077924	0.413647097	0.018409852
GEMIN8 54960	-1.040295171	0.441328542	0.018413829
CTNNB1 1499	0.76675746	0.325463099	0.018478052
GOLGA6L 9440295	-0.601954736	0.255533248	0.018488803
DNAJB13 374407	-0.257237907	0.109214664	0.018505655
KIAA1429 25962	1.690900713	0.717901275	0.018505825
UBXN1 91544	-0.718358022	0.305053479	0.01852972
PLXNB1 5364	-0.961978866	0.408568374	0.018547078
WDR67 93594	0.728331644	0.309462186	0.018595605
CDK10 8558	-1.046575259	0.444880375	0.018648346
DHX16 8449	1.524440103	0.648065637	0.018658084
UTP18 51096	1.010514205	0.42967047	0.018681041
BLNK 29760	-0.74006842	0.314685856	0.018684378
GGTA1 2681	-0.357622856	0.152074162	0.018691127
TRAF5 7188	-0.639711127	0.272063019	0.018706216
KRTAP5-9 3846	-0.379876716	0.161635103	0.018762735
GGT3P 2679	-0.361566159	0.153852487	0.01876921
FOXDL1 200350	-0.507321973	0.215901378	0.018784222
RAE1 8480	1.238886023	0.527347255	0.018809788
LTB 4050	-0.384370896	0.163630008	0.018822669
RAP1GDS1 5910	1.416058894	0.602975884	0.018851715
HOMER2 9455	-0.490146005	0.208731274	0.018863605
CD1A 909	-0.328768854	0.140096178	0.018938629
UBE2G1 7326	1.407658925	0.60001759	0.018974609
MDM4 4194	-0.978789	0.417241919	0.018983496
CNR2 1269	-0.513036137	0.218724826	0.018997604
TOPBP1 11073	0.875907859	0.373452514	0.019004993
LARS2 23395	0.972277807	0.414692705	0.019048821
KLK14 43847	-0.238718756	0.101885926	0.019129367
APOM 55937	-0.744229012	0.317658804	0.019136739
GGTLC2 91227	-0.311063652	0.13280659	0.019168869
C2orf63 130162	-0.64037213	0.273431925	0.019181737
TNFRSF6B 8771	-0.403006814	0.17208271	0.019183968
ORC1L 4998	0.634451401	0.270917627	0.019187864
RASSF7 8045	-0.748664208	0.319709307	0.019195989
MED18 54797	-1.319165049	0.563349667	0.019198956
ABCB7 22	1.149786468	0.491226566	0.019250518
CAPN3 825	-0.476493598	0.203674181	0.019310117
WDHD1 11169	0.693903268	0.296828839	0.019401681
B4GALT1 2683	-0.462645414	0.197933559	0.019419573
ZNF692 55657	-0.661189306	0.283056104	0.01949672
NXF3 56000	-0.255418614	0.109374753	0.019529781
CTPS 1503	1.036264483	0.443899525	0.01957179
ADCY4 196883	-0.540629087	0.231654649	0.019607674
TNNT2 7139	-0.284153332	0.121798379	0.019649131
POU5F1 5460	-0.282863943	0.121250827	0.019654308
IMMT 10989	1.098834924	0.471091655	0.019672882
CXorf56 63932	0.75695538	0.324530975	0.019676527
FAM124A 220108	-0.550009324	0.235822459	0.01968478
C15orf48 84419	-0.406139939	0.174139398	0.019686538
MORN3 283385	-0.41664018	0.178756918	0.01976581
XPO7 23039	1.683604811	0.722447476	0.019784054
KLHL23 151230	0.412384167	0.17695855	0.019785031
ANAPC7 51434	-1.583034741	0.679759119	0.019868751
SFRS9 8683	1.166316454	0.501006088	0.01991483
LOC283663 283663	-0.548858178	0.23583837	0.019951212
FOLH1B 219595	-0.38720379	0.166381836	0.019954629

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LOC441869 441869	-0.292927825	0.125912409	0.019995021
C3orf10 55845	1.803891716	0.775499334	0.02001303
LEPROT 54741	0.481526268	0.207019367	0.020018752
ITFG1 81533	0.810287399	0.348425224	0.020041479
PLEKHF1 79156	-0.637818498	0.27426465	0.020042114
TMEM31 203562	-0.401669663	0.172759917	0.020071077
LOC100129534 100129534	-0.489648148	0.210600067	0.0200712
RALGAPA2 57186	0.555862971	0.239105542	0.020084803
DUOXA2 405753	-0.297842997	0.128122025	0.020088957
FOXD4L6 653404	-0.481597883	0.207204899	0.020111609
C16orf13 84326	-0.708548204	0.304941375	0.020149331
CCDC36 339834	-0.4982104	0.214418523	0.020150065
ARPC2 10109	1.312348701	0.564897314	0.020170382
HTR7P1 93164	0.758516007	0.326508111	0.020172956
PRR22 163154	-0.536251013	0.230844938	0.020179566
TMSB10 9168	-0.913836339	0.393463982	0.020203808
MMP21 118856	-0.631558434	0.271931671	0.020206596
CHIA 27159	-0.239967272	0.103331095	0.020216022
ECE2 9718	0.980960893	0.422411676	0.020217519
PRR11 55771	0.44835666	0.193127422	0.020256706
C1QTNF7 114905	-0.419588762	0.180738462	0.020258555
RPRD1B 58490	1.046161249	0.450740788	0.020287816
PCDHGA4 56111	0.372046923	0.160352287	0.020330888
MDH2 4191	0.853025946	0.367660935	0.020333143
RNF207 388591	-0.498365552	0.214902262	0.020393218
FIZ1 84922	-1.204365278	0.519430283	0.020415249
TSPAN10 83882	-0.445747832	0.19232131	0.020464293
C1orf204 284677	-0.454112906	0.196047384	0.020539571
C9orf142 286257	-0.621188258	0.26830724	0.020601309
TNFRSF14 8764	-0.54148397	0.233893171	0.020607953
HSP90AB1 3326	1.306979732	0.564553135	0.02060913
KRTCAP2 200185	-0.756359231	0.326803357	0.020644861
CYP17A1 1586	-0.280710461	0.12132802	0.020686979
MCF2L 23263	-0.602792602	0.260625592	0.020729896
MST1P9 11223	-0.39042807	0.168870802	0.020778083
TXNRD1 7296	0.727547615	0.314764964	0.020810793
POLA2 23649	0.973713314	0.42128339	0.020816157
CDK9 1025	-1.485799572	0.64308876	0.020865391
KCNMB2 10242	-0.375326256	0.162476877	0.020886563
RNF215 200312	-1.07344536	0.464706616	0.020891362
HIST1H4J 8363	-0.556117039	0.240798505	0.020917488
COX19 90639	-0.907354391	0.392908195	0.020925317
POU5F1B 5462	-0.29821363	0.12918456	0.020975182
ACAD10 80724	-1.314048398	0.56929838	0.020988613
DHRS12 79758	-0.825808039	0.357776365	0.020989781
PELO 53918	1.001753472	0.434095934	0.021017074
DCTPP1 79077	0.924565076	0.400665668	0.021022926
LIMS3 96626	-0.237505186	0.102963287	0.021071674
C22orf46 79640	-0.884607409	0.383555048	0.021091779
ST6GALNAC3 256435	0.415048124	0.179975647	0.021103095
PLAC8L1 153770	-0.46079946	0.199833289	0.021115136
ZNF578 147660	-0.565421784	0.245322591	0.021177257
HCCS 3052	1.490580475	0.646821706	0.021196339
C21orf99 149992	-0.403656215	0.175234654	0.021249705
ZNF837 116412	-0.560930398	0.243552113	0.021271941
IRAK4 51135	-1.246496403	0.541239687	0.021276618
TIMELESS 8914	0.772246351	0.335336226	0.021284377
NDUFAB1 4706	1.552712367	0.674275936	0.021290955
OBSCN 84033	-0.394414114	0.17129972	0.021308139

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GEMIN5 25929	1.01850877	0.442486564	0.021347321
SLC2A9 56606	-0.616041995	0.267644225	0.021350982
PPOX 5498	-0.811341529	0.352543913	0.021369518
C21orf2 755	-0.762966188	0.331538404	0.021375215
GSTA2 2939	0.325938544	0.14163761	0.021379501
BARD1 580	0.447655613	0.194677188	0.021477898
RNASET2 8635	-0.505411057	0.219794917	0.021478462
MUC6 4588	-0.175193733	0.076192648	0.021484949
WDR89 112840	-1.202868023	0.52334098	0.021536739
SLC16A8 23539	-0.49351893	0.214736615	0.021547431
TNNI2 7136	-0.457110304	0.198927154	0.021568741
TDRD3 81550	-1.023238644	0.445416901	0.021603915
BRF1 2972	-1.046022362	0.455467237	0.021642062
LRCH3 84859	1.052479972	0.458408345	0.021679073
APEH 327	0.980088168	0.426890694	0.021682963
MAGEE1 57692	0.382869789	0.166779424	0.021695008
CHCHD3 54927	1.114389913	0.485438687	0.021696775
CD74 972	-0.412840698	0.17993648	0.021769307
CA2 760	0.374542316	0.163267925	0.021788495
ELAC1 55520	-1.097367111	0.478360913	0.021789637
KLK1 3816	-0.259170826	0.112991177	0.02180623
ASB12 142689	-0.302814824	0.132027357	0.021814845
GOLT1A 127845	-0.316956255	0.13823156	0.021851634
UCKL1AS 100113386	-0.457215288	0.199433868	0.021873009
SLC13A5 284111	-0.231340572	0.100922438	0.021890585
LOC100272146 100272146	-0.566626548	0.247223189	0.021907744
GOLGA9P 283796	-0.481361981	0.210151577	0.02198965
SFRP5 6425	-0.244109192	0.106584679	0.022004855
DOCK7 85440	0.674437439	0.294485394	0.02200835
DAXX 1616	1.829442796	0.798923043	0.022027918
SUFU 51684	-1.043641185	0.45579265	0.02203709
GGTLC1 92086	-0.352643764	0.154078507	0.022095172
KCNQ1OT1 10984	-0.486596872	0.212613156	0.022099758
EDIL3 10085	0.346453018	0.151382379	0.022102871
C19orf66 55337	-0.619266653	0.270693058	0.022154536
GATC 283459	0.648350154	0.283468007	0.022183714
SEPT12 124404	-0.533212691	0.233141232	0.022191143
NCRNA00120 55389	0.545559317	0.23856441	0.022204997
MED1 5469	0.98460459	0.430797128	0.022281113
COMMD2 51122	1.17180989	0.512761708	0.022295751
FKBP6 8468	-0.498235277	0.218160102	0.022382954
IARS 3376	0.861821426	0.377431295	0.022407627
IGSF10 285313	0.373820023	0.163734169	0.022425003
MAD2L1BP 9587	1.77258621	0.776502448	0.022443182
ELOVL5 60481	0.706962418	0.309859729	0.022515549
TSR1 55720	1.318501543	0.578161247	0.022577557
SLC24A6 80024	-0.771804228	0.338453486	0.022584869
PXK 54899	0.653515812	0.286599069	0.02259322
RHOA 387	1.610014038	0.706199175	0.022617775
TEX14 56155	-0.578375585	0.253696864	0.022620144
PDCD10 11235	0.844809518	0.370588199	0.022628755
THOC6 79228	-1.027246189	0.450712533	0.022657528
LOC650368 650368	-0.712191142	0.312493784	0.022663678
LOC100130015 100130015	-0.728079968	0.319512711	0.022683722
NRF1 4899	-1.704190342	0.74801309	0.022709337
RPS3 6188	-1.138800476	0.499851876	0.022710145
ATAD2 29028	0.585036751	0.256794227	0.022712776
PHF11 51131	-0.905883609	0.397705444	0.022739973
FKBP5 2289	0.42400769	0.186190338	0.022769461

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PLIN5 440503	-0.294301297	0.129235407	0.022771316
PIK3R1 5295	-0.410471185	0.180272951	0.022789646
MDC1 9656	0.968640935	0.425486429	0.022813139
THBS2 7058	0.353657668	0.155378994	0.022840203
HRASLS5 117245	-0.301159249	0.132354619	0.02288215
NSUN2 54888	1.47869987	0.649871565	0.022883595
NUDCD1 84955	0.797236214	0.350393302	0.022890278
PRG4 10216	-0.491172732	0.215935592	0.02292837
CDK11A 728642	-0.987549975	0.434245229	0.022955421
C1orf126 200197	-0.455484709	0.200299546	0.022964924
ITLN1 55600	-0.322742212	0.141926045	0.022964976
ZRSR2 8233	-0.727305493	0.319847076	0.022971017
USP14 9097	1.274913242	0.560704274	0.022979745
CATSPER4 378807	-0.59480001	0.261597609	0.022982759
CHRNA5 1138	0.362822504	0.159590921	0.022998878
IL4I1 259307	-0.354976928	0.156146629	0.023004715
GMPS 8833	1.027598754	0.452146777	0.023043628
PCSK1 5122	0.264245965	0.11630265	0.023083216
LOC100130933 100130933	-0.215291984	0.094785469	0.023125156
TTC28 23331	-0.734458525	0.323363216	0.02312814
ASCL2 430	-0.343702634	0.151346116	0.023148737
ZMYND12 84217	-0.369804031	0.162851572	0.023158835
AARS 16	1.194205677	0.525928503	0.023167469
PSMD2 5708	1.08547554	0.478089412	0.023180619
GOLGA4 2803	0.78965599	0.34780123	0.023181917
TMEM101 84336	-0.275987259	0.12156051	0.023185181
RNF122 79845	-0.917516487	0.40417364	0.02320123
DDX23 9416	1.505515825	0.66332317	0.023228425
MLLT6 4302	-1.27922538	0.563629547	0.023230903
DKC1 1736	1.232612772	0.543126464	0.023239362
ZNF814 730051	-0.746749018	0.329169309	0.023293489
TREH 11181	-0.289705415	0.127732816	0.023325681
C12orf47 51275	-1.41375053	0.623428019	0.023347223
SFRS8 6433	-1.453703073	0.641104215	0.023359769
PIN1L 5301	0.826990525	0.364780438	0.023384654
KLHL3 26249	-0.485956683	0.214369581	0.023395685
RPL27A 6157	-0.858103559	0.378538052	0.023397038
XRRA1 143570	-1.166298506	0.514643971	0.023437673
POLR3D 661	0.931051558	0.410871582	0.023448917
ANKAR 150709	-0.809512861	0.357369084	0.023500338
SBNO1 55206	0.542538395	0.239541946	0.023518857
DNAJC22 79962	-0.378774899	0.167305955	0.023576241
C1orf229 388759	-0.554704314	0.245023978	0.023581639
C3orf72 401089	-0.395550739	0.17476545	0.023615758
SFI1 9814	-1.032711507	0.456373186	0.023643932
NARFL 64428	-1.197217544	0.529137732	0.023661465
SBDS 51119	1.189618273	0.525831425	0.023675371
RAD21 5885	0.904683408	0.400121502	0.023757912
GOLGA2B 55592	-0.584916866	0.258730334	0.023776595
CLK4 57396	-0.907782486	0.401613873	0.023800376
KCNC4 3749	-0.563068204	0.249219066	0.023862842
DHRS7B 25979	-0.848981921	0.375794041	0.023872928
NENF 29937	-0.679137571	0.300711717	0.023918614
FAM49B 51571	0.702160225	0.31094614	0.023936871
COL6A4P2 646300	-0.29000947	0.128478694	0.023992002
IPPK 64768	1.197149423	0.530533517	0.024039271
CDK3 1018	-0.617671162	0.273823873	0.024087904
ATP11B 23200	0.450162007	0.199579812	0.024098902
GNA11 2767	0.450258094	0.199654748	0.024121813

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HUWE1 10075	0.943002763	0.41826505	0.024161094
TMEM86B 255043	-0.890464015	0.395147757	0.024227873
SNORA39 677821	0.55397326	0.245859238	0.024245714
FARSA 2193	1.42293582	0.631679382	0.024282898
RNF114 55905	1.707467434	0.758453337	0.024369761
LOC643677 643677	-0.406509263	0.180642728	0.024426772
LOH12CR2 503693	-0.750048657	0.333393975	0.024465665
DR1 1810	1.017980685	0.452494169	0.024467356
GATS 352954	-0.682086252	0.303244822	0.024493903
POSTN 10631	0.343138567	0.15259746	0.024534652
INCENP 3619	0.754314668	0.335452392	0.02453484
TP53AIP1 63970	-0.281622725	0.125241932	0.024536067
ZNF497 162968	-0.727154168	0.323397982	0.024545545
CXXC1 30827	-1.105395637	0.491662766	0.024558332
SPG7 6687	-1.392203211	0.619259248	0.024565028
MRFAP1L1 114932	-1.203130852	0.535319483	0.024608053
SIL1 64374	-0.77173618	0.343435834	0.024633355
ARHGEF3 50650	-0.774864562	0.344829354	0.024633911
LOC149134 149134	-0.351737347	0.156589242	0.024688506
RC3H2 54542	0.616605905	0.274540175	0.024706651
KLHL31 401265	-0.468552825	0.208839543	0.024858018
KIAA1715 80856	0.727979502	0.324521261	0.024881257
FAM71F1 84691	-0.367924659	0.164102919	0.024959043
APOB48R 55911	-0.51343167	0.229080131	0.025008239
LOC375190 375190	-0.631992038	0.281990839	0.025014462
ZNF542 147947	-0.684513073	0.30543924	0.025021041
ADCY3 109	0.740725301	0.33066038	0.025081883
CA3 761	-0.392634359	0.175278485	0.025087015
PRR5 55615	-0.720016641	0.321488811	0.025114821
C20orf11 54994	1.614056494	0.720823374	0.025143917
PCDHGA11 56105	0.448209075	0.200280345	0.025227026
LRP2 4036	0.194216252	0.086788817	0.025233923
RRM1 6240	0.706568521	0.315779	0.02525099
PRKAR2A 5576	0.448903571	0.20066272	0.025279479
CAMK2G 818	1.523379376	0.680985752	0.025284973
DIAPH3 81624	0.477401781	0.213461032	0.025320207
TRIP13 9319	0.614937595	0.275042742	0.025365582
RALGAPB 57148	1.390741277	0.622091354	0.025378633
CRIPAK 285464	-0.653159916	0.292205562	0.025399271
RPS6KA1 6195	-0.94616073	0.423326942	0.02541347
C16orf80 29105	1.353878396	0.605775969	0.025420697
LGTN 1939	-1.120760533	0.501587227	0.025454927
CIRL 51279	-0.749091277	0.335277649	0.02546718
MRGPRX3 117195	-0.491816714	0.220152947	0.025484559
CIAPIN1 57019	1.455150722	0.651546783	0.02552398
NUDT18 79873	-0.79200904	0.35470688	0.025558506
CCDC21 64793	0.816479081	0.365685866	0.025566524
AGPAT3 56894	-1.369578933	0.613521871	0.025593628
REEP6 92840	-0.340119629	0.152388919	0.025620358
WWTR1 25937	0.575901048	0.258065	0.025640593
DGCR14 8220	-1.171197853	0.524989381	0.025687874
LOC643719 643719	-0.451990546	0.202607863	0.025690153
KCNRG 283518	-0.350420035	0.157085417	0.025696959
RRM2 6241	0.567205623	0.254312095	0.025724049
MPP4 58538	-0.504717242	0.226363725	0.025769114
NRIP2 83714	-0.673747141	0.302234285	0.025799176
AFG3L1 172	-0.854062632	0.383126099	0.02580096
ADAM17 6868	0.697685671	0.313031179	0.025826836
ASB2 51676	-0.466949192	0.209569696	0.025871636

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RQCD1 9125	0.686610923	0.308179272	0.025883219
LGALS9C 654346	-0.475944211	0.213665636	0.025912624
KIF2A 3796	0.668433545	0.300106666	0.025925902
PGBD2 267002	-1.050119589	0.471609366	0.025969172
ZNF454 285676	-0.527656912	0.237039192	0.026012014
RASL11A 387496	-0.53646593	0.24103021	0.026032895
RINL 126432	-0.487651774	0.219119713	0.02604743
TRAM2 9697	0.897077595	0.403288441	0.026121079
ORM2 5005	-0.190154586	0.085501844	0.026149636
GPR89C 728932	-0.694038377	0.31224913	0.026235553
RUVBL1 8607	1.009211394	0.454049349	0.026236644
UBD 10537	-0.252298061	0.113560493	0.026303161
AS3MT 57412	-0.442346824	0.19911624	0.026313685
GUCY2C 2984	-0.343167108	0.154484593	0.026326057
CAGE1 285782	0.582947314	0.262461822	0.026345902
CFP 5199	-0.487746387	0.21967692	0.026399114
SNX3 8724	1.315094376	0.592418703	0.026427379
GUSBP3 653188	-0.714826911	0.32211198	0.026473965
PPAPDC1B 84513	-1.128312736	0.508554938	0.026509565
IL18BP 10068	-0.617761469	0.278488047	0.02653648
EVL 51466	-0.880399553	0.396893579	0.026539445
LRRC29 26231	-0.608341145	0.274346023	0.026594209
VCL 7414	0.934054415	0.421261158	0.026603887
C9orf103 414328	-0.517866584	0.233620808	0.026643793
PSD4 23550	-0.731346172	0.329934758	0.026647787
DYNLL2 140735	0.782000166	0.35282071	0.026662501
KIF21A 55605	0.757398064	0.341725261	0.026664481
AURKA 6790	0.600357792	0.270883148	0.026671097
ZFYVE28 57732	-0.584934775	0.263985096	0.026706085
LRRC69 100130742	-0.431837781	0.19489259	0.026707038
TOM1 10043	-0.791732096	0.357405148	0.026744763
LOC339047 339047	-0.620341539	0.280122393	0.026791827
PFDN5 5204	-0.98571749	0.44515179	0.026805387
ARL6IP4 51329	-0.867970748	0.39199974	0.02681416
BAX 581	0.97972075	0.442570964	0.026849204
GPCPD1 56261	-0.484795016	0.219201571	0.026991532
PPP1R3C 5507	-0.379839352	0.17176801	0.027011544
TREML3 340206	0.595287568	0.269267563	0.027052047
CENPO 79172	0.748156017	0.338467073	0.027075693
LOC100129637 100129637	-0.825561652	0.373490485	0.027077732
KIAA0090 23065	1.086869999	0.491840783	0.027119013
C14orf101 54916	-0.870156132	0.393872182	0.027158313
TNFRSF25 8718	-0.536074284	0.242675109	0.027173217
AGAP4 119016	-0.685587183	0.310382531	0.027185361
STAU1 6780	1.591337289	0.720826926	0.02726832
HEBP2 23593	-0.786977568	0.356482938	0.027271027
YDJC 150223	-0.928947875	0.420869589	0.02729934
CPB2 1361	-0.384269947	0.174098174	0.027299906
TRPM2 7226	-0.536660302	0.243259974	0.027375712
PCDHGA9 56107	0.357674729	0.162154618	0.027400567
PTPN9 5780	1.202204631	0.545125311	0.027427933
PTCD2 79810	0.982222339	0.445380372	0.027429113
AGPAT1 10554	1.248658112	0.566216294	0.027435364
CCDC17 149483	-0.267793399	0.12144399	0.027448664
POLR3A 11128	0.972131448	0.440937588	0.027475735
MLEC 9761	-1.10329862	0.500450774	0.027481496
RAP1GAP 5909	-0.441679189	0.200456446	0.027568868
PSMD3 5709	1.227850232	0.557323386	0.0275863
EDF1 8721	-0.794808989	0.360773838	0.027590016

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ORAI3 93129	-1.000931784	0.45436535	0.027600191
WDR3 10885	0.926183091	0.420710577	0.027702537
CHCHD7 79145	0.828854986	0.376780746	0.027818696
MYO15B 80022	-0.401774184	0.182641787	0.027821562
ACYP2 98	-0.720899285	0.327747528	0.027838359
COLQ 8292	-0.543248859	0.246984897	0.027840785
CPT2 1376	1.069993524	0.48651307	0.027855819
PKIG 11142	-0.827321611	0.37620794	0.027870297
LOC642826 642826	-0.637026024	0.289689973	0.027878469
NECAB3 63941	0.79275236	0.360579964	0.027910078
TTC35 9694	1.20262493	0.547068142	0.027927079
XPOT 11260	0.910630039	0.414362536	0.027972988
POM121L9P 29774	-0.522769441	0.237880058	0.027976356
STARD4 134429	0.589210869	0.268127831	0.027984767
CNKSR1 10256	-0.863554621	0.392997888	0.02799533
TP53TG1 11257	-0.770881328	0.350985561	0.028068085
WDR13 64743	-0.944654808	0.430141815	0.028081398
DMRTC1 63947	-0.391678977	0.178404508	0.028131012
LOC284837 284837	-0.449893037	0.204935744	0.028142925
COLEC11 78989	-0.317338597	0.144562682	0.028151934
SPA17 53340	-0.424155382	0.193234832	0.028161769
TRHDE 29953	0.258723806	0.117874172	0.028169685
ZNF841 284371	-0.896109722	0.408523641	0.028269064
TRAPPC2P1 10597	-1.256761645	0.573051913	0.028299987
ENTPD2 954	-0.340313593	0.155198535	0.028324465
PPIF 10105	0.804468951	0.366937959	0.028351783
C20orf11 51526	1.350851313	0.616180158	0.028357904
LOC729375 729375	-0.732747489	0.334255984	0.028366899
C8orf76 84933	1.070651934	0.488503393	0.028401317
TMEM90A 646658	-0.387444307	0.176821253	0.028439951
TMEM55B 90809	1.347740089	0.615333932	0.028505528
C3orf24 115795	0.59345023	0.271130717	0.028611563
SQLE 6713	0.57478715	0.262673457	0.028653626
KPNA6 23633	1.194982872	0.546106089	0.0286559
LOC349196 349196	-0.295585442	0.135129352	0.028711448
GRM5 2915	-0.303707322	0.138859232	0.028730865
FBXO32 114907	0.47319119	0.216422556	0.028784694
AGAP5 729092	-0.545629143	0.249573905	0.02879785
SIRT3 23410	-1.162860272	0.531909916	0.02880114
WAC 51322	1.346498025	0.616015959	0.028829012
ATF7IP2 80063	-0.406705271	0.186076856	0.028838707
THSD1 55901	-0.600272743	0.274679334	0.028862591
UPF2 26019	1.002327715	0.458799474	0.028912689
POC1A 25886	0.846843483	0.387807857	0.028986677
SIM2 6493	0.277708205	0.127207043	0.029026994
C2orf82 389084	-0.416732344	0.190909978	0.029045122
MGC16703 113691	-0.356460399	0.163316804	0.029062959
ADAMTS6 11174	-0.308930517	0.14160747	0.029139244
LOC389634 389634	-0.376541588	0.172606857	0.02914657
RNMT 8731	1.038370559	0.475998184	0.029149478
KIAA1908 114796	-0.699408924	0.320754393	0.029219502
CELF6 60677	-0.40979201	0.187962205	0.029243896
AP4B1 10717	-0.931443275	0.427298696	0.029269239
DPY19L2P1 554236	-0.302619637	0.13888658	0.029339275
CCDC30 728621	-0.607005606	0.278589772	0.029342738
ZNF358 140467	-0.729990761	0.335088219	0.029368593
ANKS3 124401	-0.735795593	0.337758977	0.029371549
RBMS3 27303	-0.451957445	0.207474257	0.029377875
DGAT1 8694	-1.016266158	0.466571677	0.029394383

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C22orf36 388886	-0.387598952	0.177955009	0.029400623
GTF2H3 2967	0.606560117	0.278488158	0.029402586
C20orf43 51507	1.955046904	0.897754615	0.029427825
ARHGEF10L 55160	-0.623095167	0.28617644	0.029457356
SART3 9733	1.479015966	0.679475548	0.029502789
MTHFD2 10797	0.667233423	0.306554363	0.029513544
ZHX3 23051	0.919395583	0.422516261	0.029555225
GPR176 11245	0.362355593	0.166572059	0.029602521
CSTF1 1477	1.387115245	0.63769141	0.029614088
ACSL5 51703	-0.283066621	0.13031428	0.029841772
CCDC42B 387885	-0.248304746	0.114361247	0.029913674
HSPA4L 22824	0.349931217	0.161170091	0.02991666
COL9A1 1297	-0.177920963	0.081946428	0.029917092
EFNA4 1945	-0.741098441	0.341344668	0.0299225
PLK1 5347	0.576999611	0.265887123	0.02999985
CCNA2 890	0.553169018	0.255009291	0.030066651
PAM 5066	-0.523154989	0.241276464	0.030137371
CORO6 84940	0.344933582	0.159177229	0.030236518
GAS5 60674	-0.541176801	0.249776615	0.030262072
NUP153 9972	0.824668655	0.380734747	0.03031175
PRDM15 63977	-1.228887206	0.567418254	0.030330145
ZGLP1 100125288	-0.43833833	0.202504696	0.030419594
SF3B3 23450	1.164007077	0.537776806	0.030427539
TBC1D10C 374403	-0.395178283	0.18258683	0.030438977
TMCO7 79613	0.818544385	0.37824717	0.030460797
PPM1D 8493	0.857245068	0.396155676	0.030471288
DCST1 149095	-0.488099753	0.225640552	0.030527807
MAP3K1 4214	-0.621607292	0.287372553	0.030535704
SLC25A35 399512	-0.316957124	0.14656022	0.030568811
ESR1 2099	-0.366392816	0.169436579	0.030585922
LOC728989 728989	-0.471354162	0.217977379	0.030587401
BCL7C 9274	-0.803440552	0.371556751	0.030590211
FAAH 2166	-0.522964592	0.241860309	0.03059823
LOC728875 728875	-0.56639923	0.262185093	0.030749225
UBAP2 55833	1.259909477	0.583461093	0.030821328
DUSP27 92235	0.381932845	0.176915698	0.030862512
FCRL6 343413	-0.338871581	0.156973704	0.030867294
DENND2C 163259	0.444635421	0.205982121	0.030880302
DHX33 56919	0.550772268	0.255175834	0.030896518
GNPTG 84572	-0.876448525	0.406176324	0.030943145
POM121L10P 646074	-0.565678459	0.262168631	0.030951994
GOLGA6L5 374650	-0.470793335	0.218325307	0.031053645
DNAJC4 3338	-0.772320642	0.358193823	0.03107173
SEC23B 10483	0.730910202	0.339055021	0.031104957
AMD1 262	0.971448406	0.450664021	0.031115426
GPHN 10243	0.859422958	0.398696014	0.031116122
TMEM217 221468	-0.7249671	0.336598842	0.03125574
SOLH 6650	-0.974763547	0.452591121	0.031260577
DIP2B 57609	1.082046792	0.502490505	0.031289797
VPS13B 157680	0.950215666	0.441380458	0.031332295
COG8 84342	0.956010505	0.444087309	0.031338057
C14orf182 283551	-0.521508042	0.242302941	0.031373922
STIP1 10963	1.22501164	0.569186222	0.031380354
RPL9 6133	-0.753078518	0.349950367	0.031400656
CDKL5 6792	0.383268028	0.178102858	0.031401477
KCP 375616	-0.266525644	0.123862001	0.031413498
ESYT1 23344	0.866519906	0.402765855	0.031442792
TBX19 9095	-0.610733759	0.283963091	0.031495898
CLK1 1195	-0.730202788	0.339563186	0.031522166

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FBXL20 84961	1.082163063	0.503404328	0.031579773
TDRD6 221400	-0.40189765	0.187003332	0.031622749
MAPKAPK2 9261	-1.074499629	0.499985674	0.031629578
EFNA3 1944	-0.484326733	0.225484531	0.031718702
AKIRIN1 79647	0.898738243	0.418449229	0.031730978
C3orf19 51244	-1.032136917	0.480596792	0.031744346
C2orf89 129293	-0.265453713	0.123610194	0.031752969
SLED1 643036	0.521001852	0.242628486	0.031767536
FOXM1 2305	0.516384531	0.240484843	0.031772242
ZNF600 162966	-0.815064667	0.379615565	0.031786981
DLD 1738	0.814806097	0.379560297	0.031816331
IRF7 3665	-0.482480757	0.224794239	0.031847321
HMX2 3167	0.281618752	0.131256652	0.031908265
NACA2 342538	-0.857371708	0.399657053	0.031931381
PLGLA 285189	-0.416063695	0.193986177	0.031967958
LOC283392 283392	0.318512898	0.148515374	0.031981164
FOXC2 2303	0.325491331	0.151795547	0.032010894
GTPBP8 29083	1.04001219	0.485130827	0.032050779
PNO1 56902	1.081626855	0.504632321	0.032081321
WIBG 84305	-0.984683867	0.459449108	0.032098346
SLC36A2 153201	-0.476160815	0.222217975	0.032132003
OXSR1 9943	1.331091165	0.621204765	0.032132576
FANCE 2178	0.751822546	0.350959814	0.032178209
CEP72 55722	0.61811828	0.288567771	0.032191777
ZNF524 147807	-0.847325654	0.395601194	0.032204082
ATXN7L2 127002	-0.904077485	0.422130873	0.03221767
APOL2 23780	-0.60211974	0.281238732	0.032277589
RAB7A 7879	1.734885311	0.810728362	0.032362083
MYOM2 9172	-0.505095656	0.236050081	0.032372409
MRPS23 51649	1.193700912	0.557945023	0.032398453
CABIN1 23523	-1.282012935	0.599263612	0.03241026
VPS37B 79720	-0.94754987	0.44303921	0.032455965
CD2BP2 10421	-1.570914242	0.734749163	0.032514475
C10orf107 219621	-0.237669237	0.1111167949	0.032522466
PHF13 148479	1.193328069	0.558219455	0.032537849
SLC39A14 23516	0.614902329	0.287670437	0.032555434
PPP2R2A 5520	1.013361144	0.474120978	0.032569763
KLK4 9622	-0.220073985	0.10308558	0.03277189
TRIM74 378108	-0.516934735	0.242161207	0.032787816
FURIN 5045	-0.765871911	0.358791671	0.032794789
FANK1 92565	-0.346643883	0.16239404	0.032794923
STAP2 55620	-0.536778366	0.251473191	0.032798999
SYTL1 84958	-0.497440109	0.233063656	0.032813898
GHITM 27069	0.85568796	0.400952059	0.032831295
UHRF2 115426	1.034466021	0.484957923	0.032916139
DPY19L2 283417	-0.253846676	0.11900959	0.032925264
DFFA 1676	1.220812318	0.572372538	0.032933084
FBXO22 26263	1.068272748	0.500904632	0.032950419
APIG2 8906	-0.703694374	0.329997775	0.032972206
AKR7A2 8574	0.916914579	0.430119321	0.033025928
CCDC92 80212	-0.88301763	0.414402459	0.033103858
COL22A1 169044	0.313653659	0.147277246	0.033197899
SDHA 6389	0.817944152	0.384081996	0.033203977
E2F5 1875	0.623073191	0.292619624	0.033229949
CD160 11126	-0.494558058	0.232288434	0.033248568
GARS 2617	1.058310485	0.497173851	0.033283001
LEKR1 389170	-0.506132025	0.237806601	0.033309348
MAGIX 79917	-0.353136564	0.165947216	0.033336664
WASL 8976	1.168713362	0.549227609	0.033343574

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C20orf202 400831	0.517929308	0.243400129	0.033345998
SPIRE1 56907	0.383038291	0.180021195	0.033358649
RTDR1 27156	-0.326752293	0.153602269	0.033398308
KIF13A 63971	0.667262795	0.313725348	0.033428299
PIGC 5279	-1.046230156	0.492011401	0.033467074
PFKFB1 5207	-0.594417048	0.279550272	0.033475518
COQ4 51117	-0.898647833	0.422696047	0.03350404
DPP8 54878	0.686623659	0.323029743	0.033538737
PTGIS 5740	0.237218964	0.111620057	0.033566925
PUS1 80324	-0.920168874	0.433001043	0.033578586
CSE1L 1434	0.987563293	0.464773425	0.03360102
C12orf10 60314	-1.172000421	0.551845091	0.033688112
GTF2IP1 2970	-1.034117796	0.48694344	0.033695923
CDK8 1024	0.634316607	0.298689165	0.033697919
PCDHGA6 56109	0.33403839	0.157335648	0.033745965
FANCF 2188	-0.988982015	0.46611594	0.033858644
LMTK2 22853	0.454312393	0.21415212	0.033884196
ANKDD1A 348094	-0.587762119	0.277116815	0.033922606
BHLHE22 27319	-0.389950428	0.183883901	0.033952626
MMAA 166785	-1.007858797	0.475334545	0.033979519
NCRNA00105 80161	-0.507979486	0.239615216	0.034007725
PMM2 5373	-1.019894703	0.481086985	0.034007747
LYSMD4 145748	-0.749488574	0.353592216	0.034036328
C9orf41 138199	0.533755272	0.251886367	0.034087763
ERCC3 2071	1.591335735	0.751035959	0.034102786
C20orf3 57136	1.031497707	0.486975052	0.034160367
SRGAP3 9901	-0.613425281	0.289612308	0.034167344
STAG3L4 64940	0.962117862	0.454273067	0.034181126
SPAG9 9043	1.035207332	0.488793745	0.034185087
RASGEF1C 255426	-0.279469068	0.131963092	0.03419353
LOC100302640 100302640	-0.404023537	0.190885358	0.034295773
FTCD 10841	-0.286487405	0.135359416	0.034302807
PCGF3 10336	-1.247257344	0.589463489	0.034351647
SLC38A10 124565	-0.820678757	0.387985686	0.034410394
PAOX 196743	-0.730991825	0.345725472	0.034483614
SULT1A3 6818	-0.715179442	0.338253621	0.034487177
ZIC2 7546	0.160608934	0.075963005	0.034489257
NCRNA00219 114915	-0.699039866	0.330662098	0.034510052
RPUSD3 285367	1.200673902	0.567951004	0.034511436
UBE4B 10277	1.305395898	0.61756418	0.034533912
PKD1L1 168507	-0.344272491	0.162913529	0.034581752
HSPA8 3312	0.520449537	0.246284542	0.034583291
SMS 6611	0.656549772	0.310712429	0.034596798
LOC728855 728855	-0.664076069	0.314314533	0.034619981
CREG2 200407	0.384522693	0.182039629	0.034660544
B4GALT5 9334	0.753930575	0.35692602	0.034661748
ZMAT5 55954	-0.802031387	0.379734241	0.034679071
MRPL45 84311	0.987623276	0.467636459	0.034691021
TRIM11 81559	-0.81777145	0.387355349	0.034758045
THRAP3 9967	1.370895049	0.649365279	0.03476107
OR7E91P 79315	-0.276801246	0.131129214	0.034780522
PGM2 55276	0.705859578	0.334400469	0.034787689
EFCAB4A 283229	-0.365176888	0.173007703	0.03479337
TECR 9524	-0.875179072	0.414758962	0.034850535
GSR 2936	0.487443965	0.231033587	0.034872117
NPTN 27020	1.04077732	0.493424053	0.034919051
FN3KRP 79672	1.338104455	0.634429991	0.03493212
HTRA2 27429	1.392468076	0.660220795	0.034936422
MSX1 4487	-0.212052856	0.100547732	0.034946565

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FDXACB1 91893	-0.789539071	0.374411314	0.034966348
SNX4 8723	0.945937701	0.448600378	0.034975475
AKAP3 10566	-0.438464713	0.207958827	0.034994608
C21orf125 284836	-0.345478497	0.163912902	0.035057331
ECHDC2 55268	-0.494058198	0.234419325	0.03506707
PCDHGB2 56103	0.314599552	0.149275563	0.035073506
CCT7 10574	1.37054437	0.65043308	0.035106671
CAPS2 84698	-0.407783392	0.193560339	0.035139189
AGAP7 653268	-0.48455574	0.23002961	0.035161559
AIG1 51390	-0.992214889	0.471064039	0.03517596
NAPIL5 266812	-0.602717509	0.286189686	0.035203736
REP15 387849	-0.527833965	0.250666951	0.035228837
FAM53B 9679	-0.810269346	0.384795082	0.035228987
TTL3 26140	-0.591397566	0.281077703	0.035375319
CDC123 8872	1.589533179	0.755486502	0.03537965
TSNAXIP1 55815	-0.346693824	0.164789965	0.035391292
NXN 64359	0.661053642	0.314296364	0.035441194
DUSP23 54935	-0.447995264	0.213019833	0.035459797
ASAP1 50807	0.649847741	0.309051604	0.035490606
NUCB2 4925	-0.651707238	0.309951985	0.035500131
ZHX1 11244	0.756077775	0.359615807	0.035513018
VWA1 64856	-0.433415387	0.20619728	0.035558075
RHD 6007	-0.459276349	0.218534828	0.035586904
FLJ10661 286042	-0.493607685	0.234877569	0.035592441
PTK2 5747	1.355903079	0.645529965	0.03568932
RPN2 6185	0.949707499	0.452150517	0.035691618
ZACN 353174	-0.376689687	0.179341072	0.035692837
EMR4P 326342	-0.383511897	0.182631502	0.035735709
GINS4 84296	0.64215966	0.305896818	0.035793208
TMCO4 255104	-0.644504612	0.307028697	0.035802152
SELO 83642	-0.82016636	0.390790361	0.035840053
FZD7 8324	0.315356241	0.150269747	0.035852089
PGA5 5222	-0.312921327	0.149165582	0.035921769
USF1 7391	-1.014256796	0.483619634	0.0359741
FLJ45340 402483	-0.759804306	0.362303499	0.035980416
ZNF205 7755	-0.774417018	0.369293533	0.035991543
ILF2 3608	1.028277095	0.490407239	0.036012874
RNF180 285671	-0.342354629	0.163315182	0.036057208
UQCRFS1 7386	0.836005964	0.398861388	0.03608386
C17orf46 124783	-0.590132615	0.28157288	0.0360961
ITIH4 3700	-0.377107029	0.179937337	0.036102719
KPNB1 3837	1.107876204	0.528663373	0.036116137
PPAT 5471	0.675408494	0.322328774	0.036135235
MCM7 4176	0.79146048	0.377726693	0.036142042
C16orf79 283870	-0.469099899	0.223944957	0.036196717
TSKS 60385	-0.34094619	0.162798867	0.036235166
ARSD 414	-0.627093102	0.299504875	0.036280837
FBXL6 26233	-0.845530356	0.403834759	0.036281963
COPS5 10987	1.691154971	0.807804461	0.036302741
SLC15A2 6565	-0.348681074	0.166553959	0.036304351
MLXIPL 51085	-0.279541197	0.133535488	0.036314794
ZNF438 220929	-1.022559204	0.488623983	0.036373056
PRRT1 80863	-0.583063938	0.278711898	0.03643895
AGPAT2 10555	-0.544205337	0.260186761	0.036474757
LIME1 54923	-0.427180563	0.204274757	0.036509617
PVR 5817	1.155493017	0.552553406	0.03651122
EFEMP2 30008	-0.432215126	0.206710784	0.03653549
LGI2 55203	0.355755873	0.170144293	0.036536413
PHLDB3 653583	-0.769461942	0.368091988	0.036581286

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GGT1 2678	-0.284742197	0.136235484	0.036611183
ODF3B 440836	-0.291824479	0.139627254	0.036615536
VWA5A 4013	-0.399762943	0.191280912	0.036624452
AQP8 343	-0.434798069	0.20809033	0.036665623
SLC5A11 115584	-0.346471093	0.165828625	0.036677826
STXBP5L 9515	0.319849656	0.1531489	0.036753828
RPLP0P2 113157	-0.495097436	0.23706138	0.036754753
GLYCTK 132158	-0.360604362	0.172683266	0.036776055
GOLGA7 51125	1.00143391	0.479683858	0.036825296
POM121L8P 29797	-0.361671573	0.173241524	0.036827384
C6orf163 206412	-0.438618797	0.210101893	0.036829598
USHBP1 83878	-0.401309275	0.192241894	0.036840931
CEACAM21 90273	-0.223832846	0.107230251	0.036851639
EIF2C2 27161	0.755333336	0.362060979	0.03696008
NUP210L 91181	-0.383571149	0.183932224	0.037033555
RPS15 6209	-0.786183162	0.377053774	0.037063031
NCOA6 23054	1.324959151	0.635454204	0.037063996
CDKN3 1033	0.558987506	0.268096794	0.037067374
EYA3 2140	0.459412795	0.220354143	0.037079845
C1orf163 65260	0.957281564	0.459168712	0.037086147
ITFG3 83986	-1.014347289	0.486630737	0.037121149
IQSEC2 23096	-0.867580174	0.416321723	0.037167661
SLC1A2 6506	-0.34558686	0.165854015	0.037189193
CHCHD2 51142	1.315607743	0.631467539	0.037213585
PIK3R4 30849	1.00941326	0.484563311	0.037238456
TAF13 6884	0.576651703	0.276823777	0.037242079
ID2B 84099	-0.397010775	0.190651549	0.037306911
MCM8 84515	0.63417937	0.304562557	0.037318445
NACAP1 83955	-0.913782971	0.43885736	0.037325417
ABHD2 11057	0.518760679	0.24917929	0.037353689
DENND4A 10260	0.83131707	0.399338309	0.037366559
NPEPPS 9520	1.004222875	0.482466124	0.037393919
RSPH10B2 728194	-0.247223083	0.118808446	0.037447231
OSBPL5 114879	-0.638235208	0.306742307	0.037462422
SCUBE2 57758	-0.286574798	0.137740567	0.037476005
ZNF668 79759	-1.012777587	0.486804317	0.037483233
RSPRY1 89970	0.535777831	0.257689844	0.037602855
TMEM37 140738	-0.343145582	0.165057576	0.037622429
ATG7 10533	-1.229971358	0.59174242	0.03765793
? 388795	-0.328874248	0.158235656	0.037674126
DYRK2 8445	0.779496929	0.37519986	0.037750713
ALPK3 57538	-0.292012556	0.140599538	0.037809887
GSG2 83903	0.443244665	0.213489462	0.037876391
KIAA0467 23334	-0.948154566	0.456700972	0.037885173
NPEPL1 79716	-0.848152216	0.408831919	0.038026001
REXO2 25996	0.955024184	0.460401291	0.038048679
PDP2 57546	0.60484895	0.291746346	0.038153535
KIF12 113220	-0.208235023	0.100478123	0.038224294
MTCH1 23787	0.998562816	0.481835174	0.038226683
SF3A2 8175	-0.893677707	0.431283426	0.038252804
DCI 1632	-0.71349391	0.344445942	0.038319103
TGM1 7051	-0.39770681	0.192048737	0.03837151
ROCK1 6093	0.778841615	0.376153464	0.0384016
ZCWPW1 55063	-0.598032207	0.288906813	0.038453931
VOPPI 81552	-1.073288679	0.518617517	0.038497433
ID4 3400	-0.474092817	0.229107062	0.0385173
APOBEC3F 200316	-0.589789891	0.285042661	0.038534031
TOP1 7150	0.872534654	0.421762323	0.03856647
CELF1 10658	0.986478112	0.476843987	0.038568152

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MDH1 4190	1.364062763	0.659467838	0.038599649
THBS1 7057	0.422786214	0.204468511	0.038665171
CASP4 837	-0.624718655	0.302236985	0.038735773
DNMBP 23268	-0.571715865	0.276623094	0.038755984
TYMS 7298	0.488636392	0.236448831	0.038775356
CPLX1 10815	-0.421638202	0.204052789	0.038798347
MTIF3 219402	-0.960496428	0.46486257	0.03881013
DNAJC15 29103	-0.345507913	0.167245542	0.03884055
RPL10 6134	-1.00345375	0.485825877	0.038879529
TGOLN2 10618	0.892231478	0.432128148	0.038947782
MED12L 116931	0.296603529	0.143667933	0.038969622
UFC1 51506	-0.756503932	0.366547555	0.039030709
SH3TC1 54436	-0.561497294	0.272217263	0.039142975
SPTLC2 9517	0.853604916	0.413964365	0.039205345
PPIL2 23759	-1.295747558	0.628387175	0.039205736
SARS 6301	1.217140684	0.590314796	0.039221999
PTPN6 5777	-0.755494851	0.366544308	0.0392908
NID2 22795	0.430908863	0.209108995	0.039332602
PKHD1 5314	-0.206489269	0.100213114	0.039350624
SLC25A2 89874	0.346189854	0.168032088	0.039373655
ODF2L 57489	-0.639046774	0.31022713	0.039405048
B3GNTL1 146712	-0.671609969	0.326093301	0.039440257
PLA2G4C 8605	-0.445300128	0.216215556	0.039444511
TCEB2 6923	-0.711816605	0.34563011	0.039448748
IKBKE 9641	-0.656965323	0.319059182	0.039487493
SSR4 6748	-0.627861972	0.304930358	0.039490982
EFTUD2 9343	1.200776419	0.583235777	0.03951166
SERINC3 10955	0.852330384	0.414105957	0.039566883
PPP1R1B 84152	-0.228630607	0.111084248	0.039573524
PRKCG 5582	-0.198752064	0.096570763	0.039580757
EPS8L1 54869	-0.379803433	0.184556212	0.039597026
ZDHHC24 254359	-0.760531473	0.369565511	0.039599056
TREX1 11277	-0.651712242	0.316705883	0.03961089
SLC7A9 11136	-0.391123822	0.190087486	0.039628642
RPL34 6164	-0.708523658	0.34437899	0.039648233
FAM59A 64762	0.513577772	0.249630452	0.039652355
TRPV6 55503	-0.221496561	0.107664124	0.039658129
GGT6 124975	-0.244674721	0.118996228	0.039767552
GLRX5 51218	1.40412598	0.682966379	0.039789982
HLA-DRB1 3123	-0.318353499	0.154872221	0.039822233
LOC400891 400891	-0.24038832	0.11696612	0.039860063
KLHL8 57563	0.692961549	0.33722177	0.039887366
ZNF276 92822	-0.9025324	0.439234213	0.039899659
C4BPA 722	-0.136364206	0.066371513	0.039921593
CRADD 8738	0.787324289	0.383225428	0.03993044
FUT10 84750	0.793796499	0.386399505	0.039942661
GAL3ST2 64090	-0.33349628	0.162413737	0.040036238
C16orf48 84080	-0.566664969	0.275967904	0.040036442
ERP27 121506	-0.254026645	0.123719941	0.040049374
TIMM8A 1678	1.008425582	0.49115899	0.040057538
LRRC3 81543	0.371184382	0.180809376	0.040081841
UMODL1 89766	-0.247590595	0.120621681	0.04010935
KIF23 9493	0.546164579	0.266090794	0.040116271
CCL3 6348	-0.375048906	0.182737255	0.040131355
FGFR3 2261	-0.290695025	0.141659957	0.04016363
SMARCC1 6599	0.967726032	0.471610481	0.040173511
LSG1 55341	1.219234845	0.594217582	0.04018596
RASSF3 283349	0.484530655	0.23617205	0.04020852
PSMB10 5699	-0.508929068	0.248126108	0.040258148

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KHSRP 8570	1.202550379	0.586305178	0.040260559
PMS2CL 441194	-0.885896322	0.431973006	0.040285056
SYT1 6857	0.241988031	0.118050557	0.040377337
MRPL23 6150	-0.664985977	0.324476074	0.040421599
GSTM2 2946	-0.294076753	0.143520364	0.040459712
KIAA0146 23514	0.865926224	0.422649297	0.040481133
HDHD3 81932	-0.67439496	0.329229101	0.040520206
CEBPZ 10153	0.877360893	0.428426818	0.04057309
DUOX2 50506	-0.247365062	0.120795164	0.040579012
CSMD1 64478	-0.320203774	0.156420765	0.040651514
CCDC86 79080	1.176188592	0.57471694	0.040702008
C1orf97 84791	-0.619253429	0.302602526	0.040714557
PHYH 5264	0.657664591	0.321372689	0.040714731
RG9MTD3 158234	-0.92257933	0.450876503	0.040737607
PIK3CA 5290	0.705639573	0.344901728	0.040764748
BCO2 83875	-0.343219183	0.167853931	0.040879595
MPZL2 10205	-0.551028476	0.269494191	0.040886749
PRKRIP1 79706	-0.950999106	0.465123737	0.040892801
C19orf12 83636	-1.246747354	0.609813688	0.040906885
OPN3 23596	-0.537446426	0.262932211	0.040948668
CHST10 9486	-0.586695671	0.287031454	0.040952384
PIGS 94005	0.604929606	0.295966201	0.040961996
ZNF3 7551	-1.136606824	0.556121585	0.040972327
P2RY1 5028	0.388588916	0.190151711	0.040995742
HLX 3142	-0.582043104	0.284838119	0.041011159
LOC100128288 100128288	-0.464082382	0.227116709	0.041016299
LRP8 7804	0.505104844	0.247201456	0.041023507
FBXW11 23291	1.039119158	0.508563501	0.041028322
ALG14 199857	-1.073623481	0.525581348	0.041078666
ZNF213 7760	-0.79580708	0.389713383	0.041148388
LOC440896 440896	-0.381478308	0.186818589	0.04115432
GOLGA8DP 100132979	-0.365996669	0.179256502	0.041176499
FUCA1 2517	-0.673466479	0.329860321	0.041184109
BECN1 8678	1.142823705	0.559848809	0.041220249
SF3A1 10291	0.945438766	0.463184367	0.041233776
TDGF1 6997	-0.244636076	0.119908477	0.041331405
PPP3R1 5534	1.001092103	0.490811595	0.041383526
PHAX 51808	1.300596635	0.637880145	0.04145644
TUBGCP4 27229	0.748048093	0.36691696	0.041476035
WDFY2 115825	-0.96090908	0.471423866	0.041518707
KPNA1 3836	1.368377031	0.671424843	0.041547967
HSPA9 3313	1.27615601	0.626188181	0.041552409
SAMD1 90378	0.777625634	0.38161081	0.041575411
MYLPF 29895	-0.39007728	0.191475393	0.041628116
FPR1 2357	0.327561787	0.160792913	0.041633453
STT3B 201595	0.553327787	0.271662098	0.041667717
AQP6 363	-0.254001552	0.124714016	0.041682916
DLGAP5 9787	0.447782959	0.219911008	0.041730201
DHX9 1660	0.956396078	0.469754618	0.041755555
ADAM9 8754	0.616764247	0.303068751	0.041844453
COMMD1 150684	-1.08341928	0.532585162	0.041924898
? 155060	-0.553551864	0.272183792	0.041977521
THAP3 90326	-0.8038649	0.395313427	0.042003298
LOC100132287 100132287	-0.44303371	0.217899698	0.042032301
PLLP 51090	-0.414049492	0.203710083	0.042098721
SRA1 10011	-1.170881456	0.576227493	0.042155907
ECM1 1893	-0.414409593	0.203988064	0.042200405
TCTA 6988	0.905877785	0.445946368	0.04221845
RECQL 5965	0.701435517	0.345365161	0.042255325

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C16orf75 116028	0.646346756	0.318255149	0.042264383
DPP7 29952	-0.498720874	0.245600499	0.042293728
LRRC36 55282	-0.304777549	0.150117149	0.042329641
SEPT10 151011	0.629150828	0.309953259	0.042374346
TMEM38A 79041	0.412717141	0.203331604	0.042379548
GSC 145258	-0.234231138	0.115423957	0.042426594
ADAM10 102	0.520687391	0.256595423	0.042436353
SATB1 6304	0.394738688	0.194587246	0.042499572
ZNF266 10781	-0.673722412	0.332244204	0.042581397
NPFF 8620	-0.378570248	0.186741331	0.042637463
POLR2D 5433	1.117354684	0.551262957	0.042672678
SLC4A1AP 22950	1.150494607	0.567831747	0.042752607
MRPS7 51081	1.467953076	0.724518169	0.042753575
NR2E3 10002	-0.30293305	0.149535224	0.042782135
SERPINA4 5267	-0.157398741	0.077718028	0.042841298
MRPL36 64979	1.161365722	0.573443087	0.04284168
ARL16 339231	-0.917043299	0.452958557	0.04291222
LHPP 64077	-0.540606751	0.267024984	0.042913085
PSMB2 5690	1.367613116	0.675793344	0.042999486
RNF168 165918	0.430648689	0.212836566	0.043034256
SNORD89 692205	-0.504214245	0.249254404	0.043084488
SMARCA5 8467	0.830591007	0.410645498	0.043109524
TYK2 7297	-1.121454892	0.554524792	0.043138032
PACSIN2 11252	0.53774039	0.265947788	0.043178698
STRADA 92335	-1.480967731	0.732453293	0.043183803
KMO 8564	-0.321523593	0.159059825	0.043238334
COX4I1 1327	-0.889455789	0.440044868	0.043250342
FCRL2 79368	-0.25511832	0.126227866	0.043270086
B3GALT6 126792	-1.040656326	0.515030061	0.043323888
SSR2 6746	-0.88052079	0.435855075	0.043361132
ZNF167 55888	-0.418824828	0.207341012	0.043385397
CTNND1 1500	1.094082879	0.541642284	0.043390002
GDF6 392255	0.335143278	0.16592149	0.043394724
ACACA 31	0.955428573	0.473047295	0.043411235
ISM1 140862	-0.30719307	0.152108388	0.043428328
NT5E 4907	-0.285634983	0.141469021	0.043480585
FPR2 2358	0.327112913	0.162066364	0.043550799
STK36 27148	-0.842214118	0.417300983	0.043566127
KCNK6 9424	-0.380281688	0.18846516	0.043613926
TH1L 51497	1.427074659	0.707841264	0.043790128
ERCC5 2073	-1.072258881	0.531919255	0.043817738
CES8 283848	-0.2533711	0.125691043	0.043818318
CWH43 80157	-0.199975486	0.099209235	0.043831955
LCAT 3931	-0.507859069	0.252110623	0.043964463
OCRL 4952	0.850603637	0.422295927	0.043984767
ACOT7 11332	0.583747516	0.289831842	0.044000048
GALNT12 79695	-0.373072708	0.185243155	0.044013505
MACF1 23499	0.90180993	0.447817223	0.044031566
C15orf57 90416	-0.941469185	0.467513501	0.044032671
PSME3 10197	1.441057429	0.715638183	0.044044443
GLI4 2738	-0.580725352	0.28849775	0.044122148
LENG9 94059	-0.514709141	0.255716507	0.044134458
MCM10 55388	0.437893112	0.217553944	0.044135416
C18orf55 29090	0.893102824	0.443748069	0.044153059
SNX2 6643	0.85456536	0.424892632	0.044299044
ABCA2 20	-0.517129467	0.257157329	0.044331175
LIPT1 51601	-0.939840807	0.467404504	0.044350242
SFT2D3 84826	-0.959604186	0.477394335	0.044421973
EMP1 2012	0.404745962	0.201379155	0.044444929

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RPS11 6205	-0.895868376	0.445750154	0.044452428
DHX35 60625	1.2384969	0.616331177	0.044487676
MPST 4357	-0.632939661	0.314991004	0.044495828
GLS 2744	0.518741175	0.258205376	0.044534434
LACTB2 51110	0.656368369	0.326806095	0.044597227
ODC1 4953	0.599113224	0.298314263	0.044608329
SLC1A5 6510	0.370609229	0.18455335	0.044628265
MUC12 10071	-0.273334136	0.136115358	0.044631975
PHKG1 5260	-0.453451751	0.225847583	0.044666915
PRR14 78994	-1.268537026	0.631881679	0.044690634
C1orf12 26148	0.672633604	0.335343042	0.044876786
CSNK1G1 53944	0.895346453	0.446431621	0.044902962
POLN 353497	-0.420687102	0.209833223	0.044977574
FITM2 128486	0.616058355	0.307400275	0.045060233
C1orf93 127281	-0.616440134	0.307690911	0.045130132
C4BPB 725	-0.178693858	0.089213203	0.045177514
CBX1 10951	0.757222939	0.378066047	0.045189598
STAT6 6778	-0.860990501	0.429895151	0.045199636
CDH13 1012	0.391541017	0.195591538	0.045303014
ECT2 1894	0.441401261	0.220508469	0.045312391
NPIP 9284	-0.630854612	0.315213581	0.045354032
TNNI1 7135	-0.344963447	0.172380033	0.045373013
UBXN7 26043	0.638148507	0.318918726	0.045395047
DGCR6L 85359	-0.855415906	0.427531681	0.045411295
ASCC1 51008	1.061700428	0.530866	0.045506686
THAP7 80764	-0.776049804	0.388112839	0.045549219
CCDC61 729440	-0.624373053	0.312276885	0.04556279
UBXN2B 137886	0.834518106	0.417423135	0.045585222
TIGD6 81789	-1.232051383	0.616275628	0.045587921
SLC12A3 6559	-0.234281328	0.117191633	0.045594271
SKAP1 8631	-0.295506354	0.147822356	0.045601427
KRAS 3845	0.78367745	0.392120043	0.045655425
LOC84931 84931	-0.274962073	0.137612147	0.045706416
KIAA1009 22832	-0.63115261	0.315878664	0.04570738
C9orf130 100128782	-0.571621626	0.28608719	0.045709301
MRPL42P5 359821	-0.439282091	0.219874881	0.045730429
GAB2 9846	0.628146766	0.314409327	0.045731513
C1QTNF3 114899	-0.537427122	0.269012003	0.045740387
LTBR 4055	-0.762982987	0.381934795	0.04575151
FAM21A 387680	0.241915027	0.121101589	0.045757811
CNOT7 29883	1.013800282	0.507620267	0.045807508
RPS14 6208	-0.930482573	0.465948798	0.045829188
LOC440461 440461	-0.273678252	0.137072113	0.045868597
WFIKK1 117166	-0.354077234	0.177345874	0.045875726
C1orf63 57035	-0.556951771	0.278967762	0.045882397
ATP6V1B2 526	1.038602925	0.520385929	0.045952205
C15orf56 644809	-0.531238059	0.26618671	0.045962806
SGK2 10110	-0.242687786	0.121621214	0.045994957
FAM13AOS 285512	-0.461941007	0.23151644	0.046011933
VHL 7428	0.724699748	0.363234603	0.046028855
RYK 6259	1.180644142	0.591885086	0.046073588
AGAP8 728404	-0.457343077	0.229341302	0.046134655
SURF4 6836	1.155613367	0.57959045	0.046169025
OGFR 11054	-0.895298785	0.449044941	0.046175624
TRAPPC5 126003	-0.519151988	0.260385988	0.046176265
IFT140 9742	-0.745662949	0.374005144	0.046182249
RPS6 6194	-0.787311349	0.394903361	0.046186921
MRPL3 11222	1.142311183	0.573028422	0.046210728
CYP51A1 1595	0.754643073	0.378569532	0.046216922

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RAB9A 9367	0.887061621	0.445031912	0.046233645
FLJ11235 54508	-0.482915704	0.24229001	0.046247116
MUC2 4583	-0.193338673	0.0970066	0.046256346
RRP7B 91695	-0.687794795	0.345240476	0.046346984
PROS1 5627	0.439758287	0.220767285	0.0463761
PER1 5187	0.659054229	0.330867523	0.046382293
PAK1IP1 55003	0.78473238	0.393991812	0.046398721
LOC154822 154822	-0.269351148	0.135242295	0.046412859
HNF1B 6928	-0.178489677	0.08962741	0.046430002
HIGD1A 25994	0.759696975	0.381500551	0.046443616
CAMK1G 57172	-0.42183296	0.211855934	0.046466466
MFN1 55669	0.724326381	0.363855063	0.046513846
CD1C 911	-0.287951681	0.14470149	0.046594196
SAMD11 148398	-0.272109495	0.13674137	0.046595633
SLC46A1 113235	-0.77448107	0.389196204	0.04659642
EAF1 85403	0.92677961	0.465832758	0.046644778
RAB4B 53916	-0.754549371	0.379296139	0.046663574
U2AF1 7307	-1.15631079	0.581391156	0.046715675
SGK494 124923	-0.60354603	0.303508394	0.046749289
SIAE 54414	-0.587873472	0.29569625	0.046800722
AMAC1L2 83650	-0.392002463	0.197202453	0.046831891
SNIP1 79753	1.070335113	0.53865122	0.046915168
ZNF264 9422	-1.142104158	0.574815881	0.046933001
USP39 10713	1.424177631	0.716817017	0.046943701
C1orf216 127703	0.778500103	0.391885874	0.046972508
DNHD1 144132	-0.490908577	0.247122627	0.046978067
CCT2 10576	0.969987681	0.488293087	0.046979318
ZNF429 353088	-0.481336096	0.242335109	0.047006494
RAB2A 5862	1.117272358	0.562918313	0.047168291
NT5C1B 93034	-0.419785371	0.211506173	0.047173085
BLOC1S1 2647	-0.714059462	0.359980098	0.047299539
TRIM38 10475	-0.810784325	0.408762938	0.047310778
AP3M1 26985	1.009003228	0.50870175	0.047313075
FAM160B1 57700	-0.867541266	0.437569141	0.047407865
C5orf56 441108	-0.585925953	0.295552131	0.047425633
KDM4B 23030	-0.826370165	0.416858311	0.047437105
RAC3 5881	0.507904312	0.25622628	0.047451368
NUDT14 256281	-0.550446599	0.277692618	0.047455132
AGBL2 79841	-0.247844771	0.125049978	0.047483076
SRP54 6729	1.007194546	0.508227341	0.04750392
ACSL4 2182	-0.374391268	0.188951124	0.047544352
YIPF6 286451	0.714664656	0.360692146	0.047549777
PCSK4 54760	-0.379954061	0.191763935	0.047550524
MBD3 53615	-0.90667483	0.457692202	0.047594562
KIAA0922 23240	0.788347822	0.397965951	0.047597678
ZNF554 115196	-1.045102966	0.527654311	0.04762959
RABL2B 11158	-0.830628213	0.41947945	0.047687753
ALG2 85365	-1.009702405	0.509965713	0.047710075
DNAJC17 55192	-0.736704674	0.372145168	0.04774665
ZNF444 55311	-0.839332921	0.424046788	0.047777699
CHMP5 51510	0.980831793	0.495536965	0.047778725
PIGQ 9091	-0.83509991	0.421913241	0.047780364
UBR5 51366	1.157971511	0.585093564	0.047802279
HLTF 6596	0.541686372	0.27370528	0.04780629
ST8SIA5 29906	-0.303453447	0.153364292	0.04785602
CHD7 55636	0.7066288	0.357157457	0.04787461
CSRNPI 64651	-0.701560729	0.354601553	0.047878191
ABCD1 215	-0.551449911	0.278789797	0.047927213
KPNA2 3838	0.635216408	0.321208799	0.047975998

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LOC349114 349114	-0.70028274	0.354129037	0.04798751
HNRNPR 10236	0.791434046	0.400231535	0.04799186
ANGPTL2 23452	0.576705131	0.291652588	0.047999802
AVPR1A 552	0.298231685	0.150839112	0.048024576
AKAP12 9590	0.303379507	0.153455932	0.048043745
KLF7 8609	0.472678103	0.239141075	0.048090716
MYOC 4653	-0.241017949	0.121943703	0.048101684
NUDT21 11051	0.777276322	0.393305568	0.048124687
SUCLA2 8803	0.705677177	0.357273848	0.048248671
MST1P2 11209	-0.324101413	0.164090459	0.048252412
C7orf31 136895	-0.417322968	0.211301276	0.048266565
P2RX4 5025	-0.67487705	0.341782084	0.048315504
SEC23A 10484	0.737427081	0.373488193	0.04833263
DSCC1 79075	0.558339998	0.282797864	0.048342749
PCNA 5111	0.673577899	0.341225522	0.04838217
TDGF3 6998	-0.253613955	0.12848306	0.048392014
LGALS9 3965	-0.423910403	0.214841496	0.048480646
SLC22A11 55867	-0.297195246	0.150636006	0.04850282
EFCAB6 64800	-0.317253601	0.160821882	0.048529558
LOC441089 441089	0.826486035	0.419005984	0.048553446
TSPYL3 128854	0.324562523	0.164546736	0.048556655
FLJ39653 202020	-0.613618302	0.311110198	0.048569627
NAA35 60560	0.841187492	0.426494339	0.04857197
PCDHGB3 56102	0.339415674	0.172108964	0.048598466
PRPF31 26121	-1.201176209	0.609208978	0.048644076
DPY19L2P4 442523	-0.294648147	0.149441719	0.048648519
EXOC6 54536	0.816026618	0.413945209	0.048685035
METAP2 10988	1.074446602	0.545123484	0.048722152
POLR2C 5432	1.320261941	0.669895718	0.048741383
FCF1 51077	0.898012019	0.455909271	0.048870869
C12orf45 121053	-0.699360658	0.355094248	0.048894883
CYP3A5 1577	-0.20071805	0.101918862	0.048908253
WDR27 253769	-0.60480816	0.307139273	0.048934052
DCAF12L2 340578	0.290774806	0.147677641	0.048955011
PSENEN 55851	-0.614032151	0.311886696	0.048979884
SLC30A6 55676	0.621956298	0.315913841	0.048981471
APOBEC3A 200315	-0.398241273	0.202367981	0.049078792
CES3 23491	-0.179694717	0.091332972	0.049129259
LOC100133161 100133161	-0.389547849	0.197997007	0.049132148
ASRGL1 80150	-0.309006239	0.157062642	0.049136237
TEX261 113419	1.369983071	0.696428376	0.04916526
INPP5J 27124	-0.560729854	0.285087699	0.049198438
SLC26A8 116369	-0.400810106	0.203887991	0.049317697
CXCL3 2921	-0.226949198	0.115457554	0.049338998
OTUD6A 139562	-0.400529064	0.203764974	0.049339938
C10orf32 119032	-0.736855797	0.374942879	0.049385524
SLC19A1 6573	-0.79295452	0.403541574	0.049415578
ELAVL1 1994	1.715883105	0.873235546	0.049417517
TTLL1 25809	-0.732521056	0.372844802	0.049451183
BCKDHB 594	0.68670816	0.349581149	0.049486723
PPIB 5479	-0.65566172	0.333839003	0.049529426
NCRNA00201 284702	-0.539092267	0.274498191	0.049539464
SPIN2B 474343	0.907117574	0.461892545	0.049539981
SALL2 6297	0.36224548	0.184492828	0.049591998
RRM2B 50484	0.612091308	0.311749558	0.049598885
GLTSCR1 29998	-1.156154925	0.589073426	0.049684889
ABCA7 10347	-0.428311844	0.218334344	0.049794561
RAB3GAP1 22930	1.116766169	0.569297134	0.049802337
CDC40 51362	0.795915085	0.40575292	0.049811899

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RBBP4 5928	0.76317294	0.389117048	0.049844734
BTBD1 53339	0.963295117	0.491318117	0.049921706
C6orf120 387263	0.96343119	0.491399036	0.049927071
HNRNPM 4670	0.880324753	0.449151062	0.049998738

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S2. Limit Transcript-Selection with Random Re-Sampling in Training-1.

Table S2 provides a summary of results of random re-sampling to limit the selection of transcripts associated with nodal and distant metastasis. Random re-sampling in R was used to generate the 100 random subsets of Training-1 with 60 of the 75 cases. Univariate logistic regression modeling was performed using R with transcripts included as the explanatory variable. A total of 311 transcripts (GeneSymbol|ID) were identified in at least 80% of the 100 logistic regression models with a $p < 0.05$. The seven transcripts in the final MS7 classifier are bolded and highlighted in blue.

Table S2.		
GeneSymbol ID	Percent of the 100 Training-1 Models with 60 of the 75 cases with $p < 0.05$	Max P-value in the Training-1 Models that passed with p-value < 0.05
C12orf60 144608	100	0.028415817
C14orf93 60686	100	0.021402299
C22orf43 51233	100	0.039154845
C6orf164 63914	100	0.026851375
C6orf70 55780	100	0.046313669
CALB1 793	100	0.03979270
CCDC130 81576	100	0.040641407
CDRT4 284040	100	0.033133363
COL28A1 340267	100	0.04011027
CUBN 8029	100	0.041236836
DDX24 57062	100	0.037308095
EIF2S2 8894	100	0.033840741
EPR1 8475	100	0.043403939
ETF1 2107	100	0.037956637
ETS2 2114	100	0.038287876
FAM116B 414918	100	0.037878831
FAM170A 340069	100	0.007149499
FAM53A 152877	100	0.048929526
FGFR2 2263	100	0.023147324
GSK3B 2932	100	0.043612411
H2AFB1 474382	100	0.035163813
HSCB 150274	100	0.043022595
IFT27 11020	100	0.040213212
IMPA2 3613	100	0.047453102
ITIH3 3699	100	0.016785322
KIAA0196 9897	100	0.037668608
KRTAP5-10 387273	100	0.045224516
LOC143188 143188	100	0.043771227
LUC7L 55692	100	0.04062051
MAP2K1 5604	100	0.035756349
MED14 9282	100	0.034047191
NLRP9 338321	100	0.02151933
PCDHGA1 56114	100	0.008516382
PTPLAD1 51495	100	0.036369051
RSRC1 51319	100	0.023256427
SENP3 26168	100	0.025170818
STX19 415117	100	0.036759784
TMEM22 80723	100	0.019904241

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TRIM50 135892	100	0.048027923
TRPM4 54795	100	0.031563619
TXLNG 55787	100	0.027087847
WDR64 128025	100	0.032023893
ZFP36L2 678	100	0.029852691
ZNF528 84436	100	0.040486241
ZNF688 146542	100	0.03073481
C12orf27 283460	99	0.03651706
C1orf101 257044	99	0.048499385
C1orf228 339541	99	0.046849965
CDC16 8881	99	0.043765227
CROCC 9696	99	0.033991423
LOC728743 728743	99	0.042641143
PCDHAC2 56134	99	0.032836953
TTC21A 199223	99	0.045930301
WFDC8 90199	99	0.046015336
CCDC57 284001	98	0.038147308
CPT1B 1375	98	0.047794325
DACT2 168002	98	0.044549839
LTB4R2 56413	98	0.04891201
OR2A9P 441295	98	0.047074838
RGP1 9827	98	0.040094663
SMURF1 57154	98	0.049794673
SPINLW1 57119	98	0.048800018
TBC1D3C 414060	98	0.046536832
ACAD11 84129	97	0.041203113
C17orf108 201229	97	0.048747984
C19orf25 148223	97	0.048113762
CCDC88A 55704	97	0.043874386
DLST 1743	97	0.046813234
F2R 2149	97	0.044755002
GFM1 85476	97	0.044359772
GLTSCR2 29997	97	0.046932453
LRP5L 91355	97	0.032118225
LRRC27 80313	97	0.047337511
LRRC42 115353	97	0.043650234
NAA50 80218	97	0.04094403
PAFAH1B1 5048	97	0.039408495
PCDHGA3 56112	97	0.039242731
PRPS1 5631	97	0.044059517
PSMA7 5688	97	0.048920828
QRICH1 54870	97	0.038580589
WASH3P 374666	97	0.048997783
YWHAB 7529	97	0.046519772
C2orf81 388963	96	0.04501821
MRPL13 28998	96	0.049354455
PSMD8 5714	96	0.044403835
TNIP2 79155	96	0.039150764
BDNFOS 497258	95	0.049197263
C1orf152 767846	95	0.047047081
CCDC94 55702	95	0.043685509
CYP2E1 1571	95	0.049280888
KLK2 3817	95	0.048470943
LDLRAD2 401944	95	0.049319106
MRPL49 740	95	0.047849741
RNF135 84282	95	0.049936457
SF3B2 10992	95	0.040441275
UROS 7390	95	0.049501804
VILL 50853	95	0.048705441

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C19orf18 147685	94	0.048610544
C2CD2 25966	94	0.036231619
CIRBP 1153	94	0.048548141
DDX21 9188	94	0.049459149
DDX27 55661	94	0.048671155
DNAJA3 9093	94	0.049325381
FOLH1 2346	94	0.048408887
IDUA 3425	94	0.048295577
IL20 50604	94	0.049949821
PCMT1 5110	94	0.048914118
PRIM1 5557	94	0.049812218
RCE1 9986	94	0.049731838
SGCE 8910	94	0.049900943
TEKT3 64518	94	0.046496315
UBQLNL 143630	94	0.049991482
CDK4 1019	93	0.047674922
DHX36 170506	93	0.046568634
DPM1 8813	93	0.04908066
GLOD4 51031	93	0.048741933
HCG2P7 80867	93	0.045235353
LIMS3-LOC440895 100271835	93	0.048453862
MLLT10 8028	93	0.047834605
MST4 51765	93	0.04835652
MZF1 7593	93	0.048207005
NUP155 9631	93	0.048334746
PDE9A 5152	93	0.049378082
PDLIM3 27295	93	0.048764438
PTPN18 26469	93	0.046776971
SKINTL 391037	93	0.045737942
SLC25A4 291	93	0.043508077
SPPL2B 56928	93	0.049047456
TNFSF12-TNFSF13 407977	93	0.048840254
USH2A 7399	93	0.045217579
WASH2P 375260	93	0.048635516
WDYHV1 55093	93	0.044227712
XPO5 57510	93	0.045899847
ZNF140 7699	93	0.047938151
C3orf26 84319	92	0.046671312
FERMT2 10979	92	0.048809722
HEXDC 284004	92	0.044926509
HNFA 6927	92	0.049397811
HOXD13 3239	92	0.042987585
HSD11B1L 374875	92	0.048795801
LMF1 64788	92	0.048502219
NPDC1 56654	92	0.048365428
PCYOX1 51449	92	0.048735813
PNP 4860	92	0.04797088
PRKDC 5591	92	0.043403441
PRMT5 10419	92	0.049023636
RPIL1 94137	92	0.044585874
SUGT1L 283507	92	0.04986353
TFRC 7037	92	0.049394118
TMED6 146456	92	0.04566104
WASH5P 375690	92	0.049753161
YME1L1 10730	92	0.043579625
AQP2 359	91	0.048929326
ARFGEF1 10565	91	0.041863538
C4orf44 345222	91	0.047829946
CCDC33 80125	91	0.04487868

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CLSPN 63967	91	0.049951776
COL18A1 80781	91	0.049091137
FAM193A 8603	91	0.047949723
FES 2242	91	0.045483038
MGC42105 167359	91	0.045612844
NOXA1 10811	91	0.048396479
TUBB1 81027	91	0.045345612
ARRDC4 91947	90	0.046010258
ASB9 140462	90	0.047355008
CCDC101 112869	90	0.048764217
CROCC1 84809	90	0.04933711
CYP21A2 1589	90	0.049781076
MRPL33 9553	90	0.047314604
NDUFS1 4719	90	0.049311476
PLS1 5357	90	0.049429357
PPT2 9374	90	0.049505249
SLC22A23 63027	90	0.043156965
TMEM219 124446	90	0.047422815
TXNRD2 10587	90	0.049387014
C4orf31 79625	89	0.049439572
CYP2D6 1565	89	0.049387255
EIF2B3 8891	89	0.048898243
GOLGA8F 100132565	89	0.049089678
PCDHGA2 56113	89	0.049434875
PCOLCE2 26577	89	0.049365388
PYY 5697	89	0.046103174
RHBDD3 25807	89	0.049303451
RPS6KA3 6197	89	0.049521673
SLC5A9 200010	89	0.048158737
SNRNP35 11066	89	0.047707578
TAF2 6873	89	0.046196162
TTC9C 283237	89	0.04716192
WFDC6 140870	89	0.048335609
ZNF446 55663	89	0.047969076
C8orf79 57604	88	0.046432352
CIRH1A 84916	88	0.046689048
CYP2C8 1558	88	0.046842961
EIF4A3 9775	88	0.048504241
FLJ39609 100130417	88	0.048949328
GIYD2 79008	88	0.049838914
GPR113 165082	88	0.048505813
MBTPS2 51360	88	0.049526697
MED30 90390	88	0.047932865
RAB5C 5878	88	0.048444644
RPL13 6137	88	0.048536328
SIGIRR 59307	88	0.045994211
THOC4 10189	88	0.047908263
VAT1 10493	88	0.049208191
ZMAT2 153527	88	0.047833456
ZNF582 147948	88	0.049517343
APOBEC2 10930	87	0.048931104
C9orf84 158401	87	0.047861663
ERAP2 64167	87	0.049582516
FAM114A1 92689	87	0.049824556
HOXB13 10481	87	0.049346261
ID1 3422	87	0.04918764
KIAA1161 57462	87	0.04757246
LDLR 3949	87	0.049929041
MAN2A1 4124	87	0.048496679

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MMGT1 93380	87	0.047390255
MTHFSD 64779	87	0.049306123
NEUROD2 4761	87	0.047731603
RRAGC 64121	87	0.049364072
SLC35E2 728661	87	0.047458713
TMX2 51075	87	0.04998282
WDR61 80349	87	0.049854712
ZNF10 7556	87	0.049527672
APOL4 80832	86	0.047591098
ATP5B 506	86	0.045893261
CHKB-CPT1B 386593	86	0.043638427
F10 2159	86	0.049635196
FAM111A 63901	86	0.049295129
FOXD1 2297	86	0.049500301
GART 2618	86	0.047578308
LRRC48 83450	86	0.048049037
NCRNA00167 440072	86	0.049135979
NPIPL3 23117	86	0.049668343
TBRG1 84897	86	0.047327698
TMEM114 283953	86	0.04843099
GTPBP4 23560	85	0.046015941
HAT1 8520	85	0.048538284
JMJD7-PLA2G4B 8681	85	0.049825898
LOC730101 730101	85	0.048185887
MCM4 4173	85	0.049880177
OCM 654231	85	0.044108146
PDZK1 5174	85	0.049739612
PDZK1P1 728939	85	0.048752096
PSMD1 5707	85	0.049590753
RFC1 5981	85	0.048622416
SMCR5 140771	85	0.049511807
STRAP 11171	85	0.043815938
UBQLN1 29979	85	0.049557676
WDR44 54521	85	0.048835574
ADRBK2 157	84	0.048582667
CCDC48 79825	84	0.048333171
CECR1 51816	84	0.048695769
CORO1C 23603	84	0.046070431
CSNK2A1 1457	84	0.049953179
MYH3 4621	84	0.048298352
NMRAL1 57407	84	0.049718896
PLGLB2 5342	84	0.049107826
SENP2 59343	84	0.049728375
USP9X 8239	84	0.048070527
ZSCAN4 201516	84	0.047597529
CUL2 8453	83	0.048354843
DERL1 79139	83	0.049802503
ELMOD3 84173	83	0.046974692
GMCL1 64395	83	0.049679161
HOXA13 3209	83	0.047251066
RPL32P3 132241	83	0.048654235
SLC22A18 5002	83	0.048600334
UBP1 7342	83	0.047100225
ZNF623 9831	83	0.048322198
ADAM22 53616	82	0.049952445
CALU 813	82	0.046955283
DVL2 1856	82	0.049391202
FGF1 2246	82	0.049527918
GTF2E1 2960	82	0.048377925

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P4HB 5034	82	0.048474811
SCD 6319	82	0.049813836
TTC16 158248	82	0.048200692
VKORC1L1 154807	82	0.048711092
WISP1 8840	82	0.049265451
ZFP2 80108	82	0.049958693
ZNF596 169270	82	0.047461422
C20orf134 170487	81	0.049815036
CDK2 1017	81	0.049955221
LOC390595 390595	81	0.049621409
MRPL37 51253	81	0.047447651
NANOG 79923	81	0.046298914
P2RY11 5032	81	0.049457097
RPL18 6141	81	0.049436045
SCAPER 49855	81	0.049372401
SFRS2B 10929	81	0.049851399
UBQLN2 29978	81	0.04982079
VPRBP 9730	81	0.049776182
ZNF862 643641	81	0.04924443
C22orf27 150291	80	0.049581422
C6orf217 100131814	80	0.049057036
DDX46 9879	80	0.049049463
ECT2L 345930	80	0.044041086
FAM193B 54540	80	0.04695361
FLJ42627 645644	80	0.048917703
GSTA1 2938	80	0.047762018
LOC100133612 100133612	80	0.046615172
LOC219347 219347	80	0.049526139
LOC284900 284900	80	0.046422871
MUSTN1 389125	80	0.048856233
NCRNA00174 285908	80	0.049941105
NR1H2 7376	80	0.04992139
RPL28 6158	80	0.047128269
STX18 53407	80	0.048967412
TNFRSF10A 8797	80	0.04974747
TNPO3 23534	80	0.049908346
UCP3 7352	80	0.047684473

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S3. Evaluate Candidate Transcripts in Training-2.

Table S3 provides a summary of the evaluation of the candidate transcripts from Training-1 in the Training-2 Cohort using microarray based data. Univariate logistic regression modeling for metastasis was performed in R in the 64 Training-2 cases. The relationship with metastasis was assessed using univariate logistic regression modeling with individual transcripts included as the explanatory variable. There were 33 transcripts that distinguished nodal or distant metastasis from stage I disease in Training-2 with $p < 0.05$. These transcripts were detected using the Affymetrix Plus 2.0 probeset indicated below. The seven transcripts in the final MS7 classifier are bolded and highlighted in blue.

Table S3.				
GeneSymbol ID	Probeset	Univariate Logistic Modeling In Training-2 (Affymetrix microarray)		
		Coefficient	Standard Error	P-value
SCD 6319	211708 s at	1.348364253	0.436155009	0.001991618
KLK2 3817	209854 s at	5.12179484	1.688834903	0.002423454
LDLR 3949	214170 x at	1.877044253	0.660560381	0.004488865
ZNF596 169270	232641 at	-1.123630563	0.422324916	0.007800546
MRPL37 51253	218887 at	2.509100598	0.959347925	0.008911702
PDLIM3 27295	209621 s at	1.873951228	0.71693134	0.008952824
PTPN18 26469	213521 at	1.428678566	0.562959781	0.011155215
COL18A1 80781	209081 s at	-0.999425929	0.397745913	0.011980283
LRRC27 80313	228886 at	1.283775515	0.511571383	0.012091083
LUC7L 55692	1557066 at	-1.05678706	0.422277411	0.012328841
TFRC 7037	237214 at	4.219036884	1.707523076	0.013479157
SLC35E2 728661	217122 s at	-1.306519776	0.534137211	0.014443588
ZNF623 9831	206188 at	-1.21157478	0.513568375	0.018317816
ZNF10 7556	229848 at	-1.069343172	0.453498331	0.018374336
UROS 7390	203031 s at	1.355658541	0.575704785	0.018533638
APOL4 80832	223801 s at	-1.061512979	0.467183571	0.023077216
RSRC1 51319	235354 s at	0.84580908	0.373311459	0.0234702
CCDC57 284001	1553248 at	1.031469412	0.458255601	0.024394377
HOXB13 10481	230105 at	0.868620843	0.39743493	0.028847267
ZNF140 7699	204523 at	-1.602120944	0.734665352	0.029201965
MLLT10 8028	216503 s at	1.331562976	0.611733947	0.029502752
SFRS2B 10929	229471 s at	-3.262596536	1.507603087	0.030457047
PTPLAD1 51495	217777 s at	0.773490471	0.358247303	0.030842687
HOXD13 3239	207398 at	2.901486206	1.357382088	0.032552438
CCDC88A 55704	1562648 at	-3.867982115	1.830537722	0.034598154
TBRG1 84897	230681 at	-0.962005274	0.468101902	0.039867479
TAF2 6873	209523 at	-1.473791135	0.717972467	0.040100459
PCDHGA3 56112	211879 x at	-1.637388203	0.798806994	0.040384731
ZFP36L2 678	201368 at	-0.57804217	0.287994277	0.044735743
BDNFOS 497258	239367 at	-0.726161679	0.36283173	0.045352193
GTPBP4 23560	218239 s at	1.285567087	0.646094714	0.04661846
SCAPER 49855	215848 at	0.941418527	0.473397523	0.046740655
C8orf79 57604	239297 at	-0.379856706	0.191035154	0.046766077

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S4. Require Consistency in Candidate Transcripts in Training Cohorts.

Table S4 provides a summary of the candidate transcripts with a consistent relationship with nodal metastasis in both the Training-1 and the Training-2 Cohorts. There were 23 transcripts with concordant coefficients from univariate logistic regression modeling in Training-1 and Training-2. That is both coefficients were either negative or positive. High expression of a transcript with a negative coefficient was associated with stage I disease (no metastasis). High expression of a transcript with a positive coefficient was associated with nodal or distant metastasis. The seven transcripts in the final MS7 classifier are bolded and highlighted in blue.

Table S4.			
	Univariate Logistic Modeling for Metastasis		
	Training-1 (RNA-sequencing)	Training-2 (Affymetrix microarray)	
GeneSymbol ID	Coefficient	Probeset	Coefficient
MRPL37 51253	1.595857579	218887_at	2.509100598
GTPBP4 23560	1.427071368	218239_s_at	1.285567087
MLLT10 8028	1.2737948	216503_s_at	1.331562976
PTPLAD1 51495	1.271930639	217777_s_at	0.773490471
RSRC1 51319	1.076378266	235354_s_at	0.84580908
SCAPER 49855	0.940632294	215848_at	0.941418527
LDLR 3949	0.715178001	214170_x_at	1.877044253
TFRC 7037	0.698434467	237214_at	4.219036884
SCD 6319	0.69767617	211708_s_at	1.348364253
HOXD13 3239	0.399495199	207398_at	2.901486206
PDLIM3 27295	0.383761369	209621_s_at	1.873951228
C8orf79 57604	-0.387423797	239297_at	-0.379856706
APOL4 80832	-0.465935125	223801_s_at	-1.061512979
BDNFOS 497258	-0.736747975	239367_at	-0.726161679
COL18A1 80781	-0.845828665	209081_s_at	-0.999425929
ZNF10 7556	-0.933163492	229848_at	-1.069343172
ZNF596 169270	-0.955900968	232641_at	-1.123630563
ZFP36L2 678	-1.085996313	201368_at	-0.57804217
SFRS2B 10929	-1.278118474	229471_s_at	-3.262596536
ZNF140 7699	-1.285322946	204523_at	-1.602120944
LUC7L 55692	-1.285625942	1557066_at	-1.05678706
TBRG1 84897	-1.38213156	230681_at	-0.962005274
SLC35E2 728661	-1.768533935	217122_s_at	-1.306519776

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S5. Nodal and Distant Metastasis Prediction with Clinical Factors and/or Molecular Features in Training-1.

Table S5 illustrates the accuracy for predicting nodal and distant metastasis first for the MS7 score and a select set of clinical and molecular features in the Training-1 Cohort, and then for $MS7 \pm G3 \pm MI$ to predict metastasis in the Validation-1, Training-2 and Validation-2 Cohorts. The clinical factors under investigation in the Training-1 Cohort included age at diagnosis, grade 3 (G3) disease, and myometrial invasion (MI) categorized as $<50\%$ vs $\geq 50\%$. Three aggressive molecular subtypes defined by the UCEC TCGA Research Network were evaluated in the Training-1 Cohort including copy number variant high (CNV) subtype, somatic copy number alterations (SCNA) cluster 4 subtype or the transcript-based mitotic molecular subtype. RNAseq-based transcript expression data for *ESR1*, *ARID1A*, *CTNNB1*, *KRAS*, *MKI67*, *PIK3CA* and sequencing data for mutation in TP53 or PTEN were also repurposed from the UCEC TCGA Research Network to evaluate their relationship with nodal and distant metastasis in the Training-1 Cohort.

MS7 was the best predictor of nodal and distant metastasis in the Training-1 Cohort with an AUC (95% CI) of 0.89 (0.80-0.98) as a continuous variable or 0.87 (0.97-0.96) as a categorical variable followed by 0.69 (0.59-0.80) for MI, 0.66 (0.55-0.77) for G3 disease and 0.71 (0.58-0.83) for *ESR1* transcript expression. Age at diagnosis and the other molecular features were then dropped from further consideration. Next, we compared the accuracy of companion diagnostic models that combined $MS7 \pm G3 \pm MI$ to predict nodal and distant metastasis in the Training-1 cohort. The AUC (95% CI) was 0.89 (0.80-0.98) for both the $MS7+G3$ combination and the model with MS7 alone and was 0.92 (0.85-0.99) for both the $MS7+MI$ combination and the $MS7+MI+G3$ combination. Transcript expression of *ESR1* exhibited a higher univariate AUC than

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G3 or MI but did not improve the predictive accuracy when combined with MS7 (AUC 0.89, 95% CI 0.81-0.97) or when combined with MS7 and MI (AUC 0.92, 95% CI 0.86-0.99).

Table S5. Predicting nodal and distant metastasis in endometrioid endometrial cancers.*

COHORT	Prediction Model ^	AUC	95% CI
Training-1	MS7 Score	0.89	0.80-0.98
	Age at diagnosis	0.56	0.43-0.70
	G3 (yes/no)	0.66	0.55-0.77
	MI (yes/no)	0.69	0.59-0.80
	CNV High Subtype (yes/no)	0.54	0.45-0.64
	SCNA Cluster 4 Subtype (yes/no)	0.58	0.49-0.66
	Mitotic Subtype (yes/no)	0.62	0.50-0.74
	<i>ESR1</i> Expression	0.71	0.58-0.83
	<i>ARID1A</i> Expression	0.55	0.41-0.69
	<i>CTNNB1</i> Expression	0.65	0.52-0.78
	<i>KRAS</i> Expression	0.65	0.52-0.77
	<i>MKI67</i> Expression	0.59	0.46-0.73
	<i>PIK3CA</i> Expression	0.64	0.51-0.78
	<i>TP53</i> Mutation (yes/no)	0.58	0.46-0.70
	<i>PTEN</i> Mutation (yes/no)	0.60	0.48-0.73
	MS7 Score + G3 (yes/no)	0.89	0.80-0.98
	MS7 Score + MI (yes/no)	0.92	0.85-0.99
	MS7 Score + MI (yes/no) + G3 (yes/no)	0.92	0.85-0.99
	MS7 Score + <i>ESR1</i> Expression	0.89	0.81-0.97
	<i>ESR1</i> Expression + MI (yes/no)	0.78	0.67-0.89
	MS7 Score + MI (yes/no) + <i>ESR1</i> Expression	0.92	0.86-0.99

* Models made up of one, two or three variables were evaluated based on their accuracy in predicting nodal and distant metastasis using area under the curve (AUC) and 95% confidence interval (CI) from a receiver operating characteristic curve. Bolding was used to highlight significant relationships with *P-value* < 0.05.

^ The MS7 score was calculated using the platform-centric algorithm presented in Methods and evaluated per unit increase in the score. Evaluations were also performed for age at diagnosis in years, grade 3 (G3) disease, ≥ 50% myometrial invasion (MI), the aggressive copy number variant (CNV) high subtype, the aggressive somatic copy number alteration (SCNA) cluster 4 subtype, the aggressive transcriptic-based mitotic subtype, RNA sequencing based transcriptic expression of estrogen receptor (*ESR1*), *ARID1A*, *CTNNB1*, *KRAS*, *MKI67* or *PIK3CA*, or mutations in *TP53* or *PTEN*. Modeling using the aggressive molecular subtypes or using molecular features other than MS7 was restricted to the Training-1 cohort. Mutations in *ARID1A*, *CTNNB1*, *KRAS*, *MKI67* and *PIK3CA* were also evaluated but none of these molecular features exhibited a significant relationship with nodal and distant metastasis in the Training-1 cohort and were not included in this table.

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Data for endometrioid endometrial cancer patients with local (N=55,417) vs. distant (N=3,324) disease were then downloaded from the Surveillance, Epidemiology, and End Results (SEER) Program to determine a population-based estimate for the accuracy of grade 3 (G3) disease to predict metastatic disease relative to that seen in our Training and Validation Cohorts. The area under the curve (AUC) and the 95% confidence interval (95% CI) for G3 disease were estimated from the receiver operator characteristics (ROC) analysis as 0.686 and 0.675-0.697 in SEER suggesting that the predictive accuracy for G3 in the Training-1, Validation-1 and the Training-2 cohorts were reasonable whereas that in the Validation-2 cohort was skewed. The poor performance of G3 disease in Training-2, however, likely reflected at least in part the higher proportion of stage I with G3 disease in this cohort. The converse is also true, enhanced performance of G3 in Validation-2 likely reflect the lower proportion of stage I with G3 disease in this cohort.

Receiver operating characteristics curves were also generated for age of diagnosis, race and ethnicity in the SEER cohort of endometrioid endometrial cancer patients and compared to that provided by G3 disease. The AUC \pm standard error (SE) for age at diagnosis was 0.532 ± 0.005 while that for race was 0.520 ± 0.005 and ethnicity was 0.509 ± 0.005 all substantially inferior to G3. Age at diagnosis, race and ethnicity were therefore not further included in our predictive modeling for nodal and distant metastasis in endometrioid endometrial cancer patients.

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S6. Odds of Nodal and Distant Metastasis based on the MS7 Classifier, Grade 3 and/or

Myometrial Invasion

This section provides the odds ratio and 95% confidence interval for nodal and distant metastasis using the MS7 Classifier, grade 3 (G3) disease, and/or myometrial invasion $\geq 50\%$ (MI) in the Training-1 and Training-2 Cohorts with RNA sequencing data, and for the Training-2 and Validation-2 Cohorts with Affymetrix Microarray data (Table S12).

Table S6. Odds ratio and area under the curve estimation for nodal and distant metastasis in endometrioid endometrial cancer patients using the MS7 metastasis score (based either on RNA sequencing data or Affymetrix Microarray data), grade 3 disease, and/or $\geq 50\%$ myometrial invasion.					
TYPE OF		RNA Sequencing Data		Affymetrix Microarray Data	
MODEL		<i>Training-1 [75 Cases]</i>	<i>Validation-1 [245 Cases]</i>	<i>Training-2 [64 Cases]</i>	<i>Validation-2 [81 Cases]</i>
MS7 Only		OR 2.72; 1.83-4.62, $P < 0.001$	OR 1.51; 1.18-2.00, $P = 0.002$	OR 2.72; 1.75-4.92, $P < 0.001$	OR 1.97; 1.32-3.39, $P = 0.004$
G3 Only		OR 3.92; 1.47-10.93, $P = 0.007$	OR 4.44; 1.29-20.38, $P = 0.028$	OR 1.64; 0.61-4.53, $P = 0.332$	OR 7.86; 2.16-33.12, $P = 0.003$
MI Only		OR 6.06; 2.07-20.76, $P = 0.002$	OR 6.79; 1.90-31.5, $P = 0.006$	OR 3.69; 1.28-16.01, $P = 0.023$	OR 9.94; 2.62-49.00, $P = 0.002$
MS7+G3	MS7	OR 2.69; 1.79-4.62, $P < 0.001$	OR 1.43; 1.11-1.91, $P = 0.008$	OR 2.91; 1.81-5.63, $P < 0.001$	OR 1.75; 1.15-3.12, $P = 0.025$
	G3	OR 1.12; 0.27-4.38, $P = 0.873$	OR 2.74; 0.74-13.12, $P = 0.156$	OR 0.56; 0.12-2.28, $P = 0.438$	OR 4.51; 1.08-20.61, $P = 0.041$
MS7+MI	MS7	OR 2.85; 1.83-5.26, $P < 0.001$	OR 1.37; 1.06-1.82, $P = 0.021$	OR 2.59; 1.69-4.67, $P < 0.001$	OR 1.95; 1.23-3.57, $P = 0.013$
	MI	OR 7.70; 1.59-53.48, $P = 0.020$	OR 4.81; 1.26-23.21, $P = 0.029$	OR 5.37; 1.28-26.35, $P = 0.026$	OR 7.51; 1.76-41.80, $P = 0.010$
MS7+G3+MI	MS7	OR 2.91; 1.84-5.43, $P < 0.001$	OR 1.32; 1.02-1.76, $P = 0.044$	OR 2.86; 1.78-5.59, $P < 0.001$	OR 1.75; 1.09-3.25, $P = 0.040$
	G3	OR 0.72; 0.15-3.03, $P = 0.656$	OR 2.70; 0.70-13.11, $P = 0.169$	OR 0.38; 0.06-1.79, $P = 0.249$	OR 3.03; 0.63-15.03, $P = 0.163$
	MI	OR 8.20; 1.65-58.47, $P = 0.018$	OR 7.72; 1.25-22.77, $P = 0.030$	OR 6.42; 1.46-34.30, $P = 0.018$	OR 5.92; 1.30-34.01, $P = 0.028$
<p>Relationship with nodal or distant metastasis expressed as odds ratio (OR) and 95% confidence interval (CI) from logistic regression modeling using profile-likelihood method or area under the curve (AUC) and 95% CI interval from a receiver operating characteristic curve. Bolding is used to highlight significant relationships with $P\text{-value} < 0.05$.</p> <p>The MS7 metastasis score was calculated using the platform-centric algorithm presented in Methods and evaluated per unit increase in the score. Grade 3 disease was abbreviated G3. Myometrial invasion $\geq 50\%$ was abbreviated MI.</p>					

Supplement S1 to S15

S7. Raw Data for Evaluating Risk of Metastasis in Validation-1 and Validation-2.

Table S6 provides a summary of the data that was used to evaluate risk of metastasis using the MS7 score, grade 3 disease and/or myometrial invasion categorized as < vs \geq 50%.

Table S7. Raw Data for Evaluating Risk of Metastasis in the 245 Validation-1 Cases and the 81 Validation-2 Cases						
Cohort	Sample name	Metastasis (Stage IIIC/IV)	Grade 3 Disease	MI \geq 50%	MS7 Score	MS7 Group
V1	GYNCOE01	No	No	Yes	-1.99991	1
V1	GYNCOE10	No	No	Yes	-1.69131	1
V1	GYNCOE11	No	No	No	2.250012	1
V1	GYNCOE12	Yes	Yes	No	-0.09079	1
V1	GYNCOE13	Yes	Yes	Yes	3.003566	1
V1	GYNCOE14	No	No	No	-1.30353	1
V1	GYNCOE15	No	Yes	No	-3.25468	0
V1	GYNCOE02	No	Yes	No	-0.08021	1
V1	GYNCOE03	Yes	No	Yes	-1.51882	1
V1	GYNCOE04	No	No	Yes	-0.43465	1
V1	GYNCOE05	No	No	No	-3.11658	0
V1	GYNCOE06	Yes	No	Yes	-2.95746	0
V1	GYNCOE07	Yes	Yes	No	1.802693	1
V1	GYNCOE08	Yes	No	No	-1.4863	1
V1	GYNCOE09	Yes	Yes	Yes	6.353986	1
V1	TCGA_A5_A0GB	No	Yes		0.034768	1
V1	TCGA_A5_A0GD	No	No	No	-8.45536	0
V1	TCGA_A5_A0GE	No	No	No	-2.15866	0
V1	TCGA_A5_A0GH	No	Yes	No	1.924428	1
V1	TCGA_A5_A0GI	No	No	No	-4.55785	0
V1	TCGA_A5_A0GJ	No	No	No	-3.48305	0
V1	TCGA_A5_A0GM	No	No	No	-4.68892	0
V1	TCGA_A5_A0GN	No	No	Yes	-3.00377	0
V1	TCGA_A5_A0GP	No	No	No	-0.97583	1
V1	TCGA_A5_A0GQ	No	No	Yes	-7.1368	0
V1	TCGA_A5_A0GR	No	No	No	-2.02109	0
V1	TCGA_A5_A0GU	No	No	No	-6.39266	0
V1	TCGA_A5_A0GV	No	No	No	-8.70338	0
V1	TCGA_A5_A0GW	No	Yes	No	-1.45237	1
V1	TCGA_A5_A0GX	No	No	No	-1.64199	1
V1	TCGA_A5_A0R7	No	No	No	-3.45006	0
V1	TCGA_A5_A0R8	No	No	Yes	-3.88646	0

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V1	TCGA_A5_A0R9	No	No	No	-3.93718	0
V1	TCGA_A5_A0RA	No	No	Yes	-10.912	0
V1	TCGA_A5_A0VO	No	No	Yes	-2.43665	0
V1	TCGA_A5_A0VP	No	Yes	No	-2.97798	0
V1	TCGA_A5_A0VQ	No	Yes	No	-4.75546	0
V1	TCGA_A5_A1OJ	No	No	No	-2.85186	0
V1	TCGA_A5_A2K5	No	Yes	No	-5.84854	0
V1	TCGA_A5_A3LO	No	Yes	Yes	-0.40974	1
V1	TCGA_AJ_A23O	No	Yes	Yes	-1.42696	1
V1	TCGA_AJ_A2QK	No	Yes	No	-1.20479	1
V1	TCGA_AJ_A2QO	No	Yes	Yes	-1.54452	1
V1	TCGA_AJ_A3BH	No	Yes	Yes	0.810693	1
V1	TCGA_AJ_A3BI	No	Yes	No	-6.02388	0
V1	TCGA_AJ_A3BK	No	Yes	Yes	-4.73498	0
V1	TCGA_AJ_A3EK	No	Yes	No	1.985956	1
V1	TCGA_AJ_A3EL	No	Yes	No	-1.68418	1
V1	TCGA_AJ_A3EM	No	Yes	No	1.288767	1
V1	TCGA_AJ_A3NC	No	Yes	No	-2.91078	0
V1	TCGA_AJ_A3NE	No	Yes	No	-7.72561	0
V1	TCGA_AJ_A5DV	No	Yes	No	-2.71609	0
V1	TCGA_AJ_A5DW	No	No	No	-4.2173	0
V1	TCGA_AP_A051	No	Yes	No	-3.59781	0
V1	TCGA_AP_A053	No	Yes	No	-0.62866	1
V1	TCGA_AP_A059	No	Yes	No	-1.21211	1
V1	TCGA_AP_A05N	No	No	No	-0.9967	1
V1	TCGA_AP_A05O	No	Yes	Yes	-1.32408	1
V1	TCGA_AP_A05P	No	No	No	-2.5996	0
V1	TCGA_AP_A0LG	No	Yes	No	-2.10156	0
V1	TCGA_AP_A0LJ	No	No	No	-3.70539	0
V1	TCGA_AP_A0LL	No	No	No	-5.99915	0
V1	TCGA_AP_A0LN	No	No	No	-5.32793	0
V1	TCGA_AP_A0LO	No	No	No	-3.01879	0
V1	TCGA_AP_A0LS	No	No	No	-3.70811	0
V1	TCGA_AP_A0LV	No	No	No	-2.86553	0
V1	TCGA_AP_A1DH	No	Yes	No	-1.04252	1
V1	TCGA_AP_A1DO	No	No	No	-6.77194	0
V1	TCGA_AP_A1DP	No	No	No	-3.15469	0
V1	TCGA_AP_A1E1	No	No	No	-6.76169	0
V1	TCGA_AP_A1E4	No	No	Yes	2.015109	1

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V1	TCGA_B5_A0JS	No	No	No	-2.77454	0
V1	TCGA_B5_A0JU	No	No	No	-2.29838	0
V1	TCGA_B5_A0JV	No	No	No	0.093947	1
V1	TCGA_B5_A0K0	No	No	No	-3.52513	0
V1	TCGA_B5_A0K1	No	No	No	-10.4341	0
V1	TCGA_B5_A0K3	No	Yes	No	-0.18674	1
V1	TCGA_B5_A0K4	No	No	Yes	-1.49941	1
V1	TCGA_B5_A0K6	No	No	No	-5.26702	0
V1	TCGA_B5_A0K7	No	No	No	-8.18689	0
V1	TCGA_B5_A0KB	No	Yes	Yes	-1.4714	1
V1	TCGA_B5_A11E	No	Yes	Yes	-0.16638	1
V1	TCGA_B5_A11F	No	No	No	-2.56054	0
V1	TCGA_B5_A11G	No	No	No	-5.33571	0
V1	TCGA_B5_A11J	No	No	No	-1.20889	1
V1	TCGA_B5_A11L	No	No	Yes	1.555711	1
V1	TCGA_B5_A11M	No	No	No	-1.95248	1
V1	TCGA_B5_A11N	No	No	No	-2.80691	0
V1	TCGA_B5_A11O	No	No	No	-2.6482	0
V1	TCGA_B5_A11P	No	Yes	No	-3.3191	0
V1	TCGA_B5_A11S	No	No	No	-4.05162	0
V1	TCGA_B5_A11V	No	No	No	-3.67245	0
V1	TCGA_B5_A11W	No	No	Yes	-3.32422	0
V1	TCGA_B5_A11Y	No	No	Yes	-3.53357	0
V1	TCGA_B5_A11Z	No	No	No	-6.60977	0
V1	TCGA_B5_A1MV	No	No	No	-1.59285	1
V1	TCGA_B5_A1MW	No	Yes	No	-1.3411	1
V1	TCGA_B5_A1MX	No	Yes	Yes	-2.11287	0
V1	TCGA_B5_A1MZ	No	No	No	-2.4231	0
V1	TCGA_B5_A3F9	No	Yes	No	-4.32953	0
V1	TCGA_B5_A3FA	No	Yes	Yes	-4.15976	0
V1	TCGA_B5_A3FB	No	Yes	No	-4.47101	0
V1	TCGA_B5_A3FD	No	Yes	No	-2.20035	0
V1	TCGA_B5_A3FH	No	Yes	No	-1.55053	1
V1	TCGA_BG_A0LW	No	No	No	-2.55397	0
V1	TCGA_BG_A0LX	No	No	Yes	0.004069	1
V1	TCGA_BG_A0M0	No	No	No	-8.10441	0
V1	TCGA_BG_A0M2	No	No	Yes	-2.80184	0
V1	TCGA_BG_A0M3	No	No	Yes	-4.53219	0
V1	TCGA_BG_A0M4	No	Yes	No	-1.54173	1

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V1	TCGA_BG_A0M8	No	Yes	Yes	-2.56549	0
V1	TCGA_BG_A0M9	No	No	Yes	-3.676	0
V1	TCGA_BG_A0MA	No	Yes	Yes	-2.68757	0
V1	TCGA_BG_A0MC	No	No	No	-3.61877	0
V1	TCGA_BG_A0MH	No	No	Yes	2.397145	1
V1	TCGA_BG_A0MI	No	No	No	-4.19167	0
V1	TCGA_BG_A0MO	No	No	No	-2.72976	0
V1	TCGA_BG_A0MQ	No	No	No	-6.84013	0
V1	TCGA_BG_A0MT	No	No	No	-6.98581	0
V1	TCGA_BG_A0RY	No	No	Yes	-6.99606	0
V1	TCGA_BG_A0VV	No	No	Yes	-3.90228	0
V1	TCGA_BG_A0VW	No	No	Yes	-5.16103	0
V1	TCGA_BG_A0VX	No	No	No	-3.68517	0
V1	TCGA_BG_A0W2	No	No	No	-3.33433	0
V1	TCGA_BG_A0YU	No	No	Yes	-5.10484	0
V1	TCGA_BG_A187	No	No	Yes	-2.82922	0
V1	TCGA_BG_A18A	No	No	Yes	0.585632	1
V1	TCGA_BG_A18B	No	No	No	-1.72855	1
V1	TCGA_BG_A18C	No	No	No	-1.82771	1
V1	TCGA_BG_A220	No	Yes	No	-4.98516	0
V1	TCGA_BG_A221	No	Yes		0.519427	1
V1	TCGA_BG_A222	No	Yes	No	-0.97915	1
V1	TCGA_BG_A2AE	No	Yes		-0.93293	1
V1	TCGA_BG_A2L7	No	Yes	No	-3.30823	0
V1	TCGA_BK_A0C9	No	No	No	-0.61616	1
V1	TCGA_BK_A139	No	Yes		1.453986	1
V1	TCGA_BK_A13B	No	Yes		-3.02196	0
V1	TCGA_BK_A13C	No	No	No	-1.5707	1
V1	TCGA_BK_A4ZD	No	Yes	No	-2.25358	0
V1	TCGA_BK_A56F	No	No	Yes	-0.881	1
V1	TCGA_BS_A0TD	No	No	No	-4.16363	0
V1	TCGA_BS_A0U5	No	No	No	-4.66379	0
V1	TCGA_BS_A0U7	No	No	Yes	-0.39354	1
V1	TCGA_BS_A0UA	No	No	No	-2.36491	0
V1	TCGA_BS_A0UJ	No	No	No	-8.30123	0
V1	TCGA_BS_A0UL	No	No	No	1.000281	1
V1	TCGA_BS_A0UM	No	No	No	-2.81168	0
V1	TCGA_BS_A0V7	No	No	No	-9.79918	0
V1	TCGA_D1_A0ZN	No	No	No	-1.16449	1

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V1	TCGA_D1_A0ZO	No	No	No	-0.03619	1
V1	TCGA_D1_A0ZQ	No	No	Yes	2.055545	1
V1	TCGA_D1_A0ZR	No	No	No	-4.09242	0
V1	TCGA_D1_A0ZS	No	Yes	No	3.118761	1
V1	TCGA_D1_A0ZU	No	No	No	-0.90316	1
V1	TCGA_D1_A0ZV	No	No	No	-4.15704	0
V1	TCGA_D1_A101	No	No	No	-0.917	1
V1	TCGA_D1_A102	No	No	No	-5.26199	0
V1	TCGA_D1_A103	No	No	No	-0.76019	1
V1	TCGA_D1_A15Z	No	No	No	-4.68719	0
V1	TCGA_D1_A160	No	No	No	-2.78923	0
V1	TCGA_D1_A161	No	No	Yes	-2.2873	0
V1	TCGA_D1_A167	No	No	Yes	-2.82223	0
V1	TCGA_D1_A16D	No	No	Yes	-2.71114	0
V1	TCGA_D1_A16E	No	No	No	-4.29673	0
V1	TCGA_D1_A16F	No	No	No	-0.61819	1
V1	TCGA_D1_A16O	No	No	No	-2.98863	0
V1	TCGA_D1_A16R	No	No	No	-3.74809	0
V1	TCGA_D1_A16X	No	No	No	-4.18105	0
V1	TCGA_D1_A16Y	No	No	No	-2.79137	0
V1	TCGA_D1_A174	No	Yes	No	-0.89365	1
V1	TCGA_D1_A175	No	Yes	Yes	-2.21332	0
V1	TCGA_D1_A176	No	No	No	-3.95064	0
V1	TCGA_D1_A177	No	No	Yes	-1.18643	1
V1	TCGA_D1_A17B	No	No	No	-0.52702	1
V1	TCGA_D1_A17C	No	No	No	-0.35747	1
V1	TCGA_D1_A17D	No	Yes	Yes	-3.35997	0
V1	TCGA_D1_A17F	No	No	No	-4.46695	0
V1	TCGA_D1_A17H	No	No	Yes	-2.12812	0
V1	TCGA_D1_A17K	No	No	No	-0.68156	1
V1	TCGA_D1_A17L	No	No	No	-9.73906	0
V1	TCGA_D1_A17N	No	No	No	-2.83232	0
V1	TCGA_D1_A17Q	No	No	No	-3.25261	0
V1	TCGA_D1_A17R	No	No	No	-2.75318	0
V1	TCGA_D1_A17S	No	No	No	-7.5764	0
V1	TCGA_D1_A17T	No	No	No	-8.23572	0
V1	TCGA_D1_A1NS	No	No	No	-4.64295	0
V1	TCGA_D1_A1NY	No	Yes	Yes	-1.18323	1
V1	TCGA_D1_A1NZ	No	No	No	-3.38689	0

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V1	TCGA_D1_A1O0	No	Yes	No	-2.99752	0
V1	TCGA_D1_A1O5	No	No	No	-3.95213	0
V1	TCGA_D1_A1O7	No	No	No	-1.99442	1
V1	TCGA_D1_A2G5	No	Yes	No	-1.80681	1
V1	TCGA_D1_A3DH	No	Yes	No	-1.14067	1
V1	TCGA_DF_A2KN	No	Yes	Yes	0.575592	1
V1	TCGA_DF_A2KR	Yes	Yes	Yes	-1.04372	1
V1	TCGA_DF_A2KS	No	Yes	No	1.859235	1
V1	TCGA_DF_A2KU	No	Yes	No	-5.66909	0
V1	TCGA_DF_A2KV	No	Yes	No	-7.36277	0
V1	TCGA_DF_A2KY	Yes	Yes	Yes	-0.58299	1
V1	TCGA_DF_A2KZ	No	Yes	No	-1.00846	1
V1	TCGA_DF_A2L0	Yes	Yes	Yes	-7.13944	0
V1	TCGA_DI_A0WH	No	Yes	No	-5.39984	0
V1	TCGA_DI_A1C3	No	No	No	-3.43945	0
V1	TCGA_E6_A1LX	No	Yes	No	0.882908	1
V1	TCGA_E6_A2P9	No	Yes	No	-0.74738	1
V1	TCGA_EC_A1NJ	No	No	No	-1.96284	1
V1	TCGA_EC_A1QX	No	Yes		-1.27372	1
V1	TCGA_EO_A1Y7	No	Yes	Yes	-1.31768	1
V1	TCGA_EO_A22R	No	Yes	Yes	0.91137	1
V1	TCGA_EO_A22S	No	Yes	Yes	0.759266	1
V1	TCGA_EO_A22U	No	Yes	Yes	0.775061	1
V1	TCGA_EO_A22Y	No	Yes	Yes	-2.54972	0
V1	TCGA_EO_A3AS	No	Yes	No	-1.76708	1
V1	TCGA_EO_A3AV	Yes	Yes	Yes	-0.9307	1
V1	TCGA_EO_A3AY	No	Yes	Yes	-5.9897	0
V1	TCGA_EO_A3B0	Yes	Yes		1.396153	1
V1	TCGA_EO_A3KX	No	Yes	No	-3.32707	0
V1	TCGA_EO_A3L0	No	Yes	No	-2.26909	0
V1	TCGA_EY_A1G8	No	Yes	No	-5.67838	0
V1	TCGA_EY_A1GC	No	Yes	No	-2.04149	0
V1	TCGA_EY_A1GD	No	No	No	-2.61499	0
V1	TCGA_EY_A1GE	No	No	No	-6.66196	0
V1	TCGA_EY_A1GF	No	No	No	-3.31335	0
V1	TCGA_EY_A1GH	No	No	No	-4.70853	0
V1	TCGA_EY_A1GI	No	No	Yes	0.91291	1
V1	TCGA_EY_A1GK	No	Yes	Yes	0.698147	1
V1	TCGA_EY_A1GP	No	No	No	-0.06008	1

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V1	TCGA_EY_A1GQ	No	Yes	Yes	0.944542	1
V1	TCGA_EY_A1GR	No	Yes	No	-0.09252	1
V1	TCGA_EY_A1GU	No	No	Yes	-3.83009	0
V1	TCGA_EY_A215	No	Yes	Yes	-3.13588	0
V1	TCGA_EY_A2OM	No	Yes	No	-3.16227	0
V1	TCGA_EY_A2OP	No	Yes	No	-0.80962	1
V1	TCGA_EY_A2OQ	No	Yes	No	-3.85787	0
V1	TCGA_EY_A547	No	Yes	No	-1.15968	1
V1	TCGA_EY_A548	No	No	No	-4.63278	0
V1	TCGA_EY_A549	No	Yes	No	-4.61489	0
V1	TCGA_EY_A5W2	No	Yes	Yes	-3.44798	0
V1	TCGA_FI_A2D0	No	Yes	No	-3.1207	0
V1	TCGA_FI_A2D6	No	Yes	Yes	1.570423	1
V1	TCGA_FI_A2F4	No	Yes	Yes	-6.76582	0
V1	TCGA_FI_A2F9	No	Yes	No	0.3813	1
V1	TCGA_H5_A2HR	No	Yes	No	-6.7738	0
V1	TCGA_SL_A6J9	No	Yes	Yes	-1.99676	1
V1	TCGA_SL_A6JA	No	Yes	Yes	-10.9793	0
V2	V2-001	Yes	Yes	Yes	-2.3382	1
V2	V2-002	Yes	Yes	Yes	-3.79634	1
V2	V2-003	No	No	Yes	-4.64996	0
V2	V2-004	Yes	Yes	No	-0.28308	1
V2	V2-005	No	No	Yes	-6.4336	0
V2	V2-006	No	No	No	-5.11437	0
V2	V2-007	No	Yes	Yes	-3.92491	1
V2	V2-008	Yes	No	Yes	-4.79312	0
V2	V2-009	No	No	Yes	-3.43526	1
V2	V2-010	No	Yes	No	-4.09785	1
V2	V2-011	No	Yes	No	-9.95483	0
V2	V2-012	Yes	No	Yes	-5.51439	0
V2	V2-013	No	No	No	-3.63301	1
V2	V2-014	Yes	Yes	Yes	-0.51336	1
V2	V2-015	No	No	No	-4.33161	0
V2	V2-016	No	Yes	No	-5.19149	0
V2	V2-017	No	No	Yes	-5.36758	0
V2	V2-018	Yes	No	Yes	-4.15388	1
V2	V2-019	No	No	No	-3.91468	1
V2	V2-020	No	No	No	-12.3511	0
V2	V2-021	No	No	No	-7.58965	0

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V2	V2-022	No	No	No	-4.90618	0
V2	V2-023	No	No	No	-2.64352	1
V2	V2-024	No	No	No	-4.50662	0
V2	V2-025	No	Yes	Yes	-3.626	1
V2	V2-026	No	No	No	-10.4927	0
V2	V2-027	No	Yes	No	-3.91705	1
V2	V2-028	No	No	No	-3.93342	1
V2	V2-029	No	No	No	-8.19999	0
V2	V2-030	No	Yes	Yes	-6.52674	0
V2	V2-031	No	No	No	-5.79328	0
V2	V2-032	No	No	No	-6.66609	0
V2	V2-033	No	No	No	-2.53269	1
V2	V2-034	No	No	No	-5.5572	0
V2	V2-035	No	No	No	-3.37735	1
V2	V2-036	No	No	No	-6.14482	0
V2	V2-037	No	Yes	Yes	-3.28338	1
V2	V2-038	No	Yes	No	-4.16479	1
V2	V2-039	No	Yes	No	-5.56891	0
V2	V2-040	No	No	No	-6.37766	0
V2	V2-041	No	Yes	Yes	-2.83556	1
V2	V2-042	No	No	No	-4.49953	0
V2	V2-043	No	Yes	Yes	-5.19278	0
V2	V2-044	No	No	Yes	-5.05525	0
V2	V2-045	No	No	No	-5.06386	0
V2	V2-046	No	No	No	-7.0635	0
V2	V2-047	No	No	No	-6.39939	0
V2	V2-048	No	No	No	-4.60869	0
V2	V2-049	No	No	No	-3.59034	1
V2	V2-050	Yes	No	No	-3.39768	1
V2	V2-051	No	No	No	-8.18358	0
V2	V2-052	No	No	No	-4.76607	0
V2	V2-053	No	No	No	-5.79173	0
V2	V2-054	No	No	Yes	-3.72208	1
V2	V2-055	No	No	Yes	-5.38245	0
V2	V2-056	No	No	No	-3.31822	1
V2	V2-057	No	No	No	-4.72735	0
V2	V2-058	No	No	No	-7.87303	0
V2	V2-059	No	No	No	-8.12095	0
V2	V2-060	No	No	No	-3.84654	1

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V2	V2-061	No	No	No	-3.40411	1
V2	V2-062	No	No	No	-4.3869	0
V2	V2-063	No	No	No	-5.35806	0
V2	V2-064	No	No	No	-7.54247	0
V2	V2-065	No	No	No	-8.24553	0
V2	V2-066	No	Yes	No	-3.41936	1
V2	V2-067	No	No	Yes	-2.68217	1
V2	V2-068	No	No	Yes	-4.57305	0
V2	V2-069	No	No	No	-1.96757	1
V2	V2-070	No	No	Yes	-4.09893	1
V2	V2-071	No	No	No	-9.27302	0
V2	V2-072	No	No	No	-3.74638	1
V2	V2-073	No	No	No	-8.95212	0
V2	V2-074	No	No	No	-7.83637	0
V2	V2-075	No	No	No	-7.51532	0
V2	V2-076	No	Yes	No	-4.90483	0
V2	V2-077	No	No	No	-3.27616	1
V2	V2-078	Yes	Yes	No	-4.22075	1
V2	V2-079	Yes	Yes	Yes	1.284991	1
V2	V2-080	Yes	Yes	Yes	-5.64037	0
V2	V2-081	Yes	Yes	Yes	-3.55309	1

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S8. MS7 Classifier Correlations with Cancer Biomarker Expression.

Table S8 provides the discovery and then validation of the correlation between the MS7 classifier and transcript-based expression of cancer biomarkers using RNAseq data in the Training-1 Cohort and then in the Validation-1 Cohort, respectively.

Table S8.				
	Training-1 (N=75)		Validation-1 (N=245)	
RNA-sequence based expression	<i>R</i>	P	<i>R</i>	p
<i>ARID1A</i>	0.303	0.008	0.236	<0.001
<i>CTNNB1</i>	0.396	<0.001	0.246	<0.001
<i>KRAS</i>	0.265	0.022	0.335	<0.001
<i>MKI67</i>	0.387	<0.001	0.315	<0.001
<i>PIK3CA</i>	0.265	0.022	0.335	<0.001
<i>ESR1</i>	-0.421	<0.001	-0.235	<0.001

Spearman's correlation coefficient (*R*).

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S9. MS7 Classifier Relationship with Mutations in Cancer Biomarkers.

Table S9.1 provides a summary of the relationship between the MS7 classifier and mutations in *ARID1A*, *CTNNB1*, *KRAS*, *PIK3CA*, *TP53* and *PTEN* in 197 TCGA cases that underwent sequencing and mutational analysis by the UCEC TCGA Research network. Table S9.2 shows the triangulated relationship between MS7 level and mutation status for CTNNB1 and TP53 in this cohort.

Table S9.1. Relationship between the MS7 classifier and mutations in TCGA.			
	MS7 Low with Cases (%)	MS7 High with Cases (%)	<i>P</i> value ¹
<i>ARID1A</i> mutation			0.363
No	80 (63.5)	40 (56.3)	
Yes	46 (36.5)	31 (43.7)	
<i>CTNNB1</i> mutation			0.014
No	71 (56.4)	53 (74.7)	
Yes	55 (43.7)	18 (25.4)	
<i>KRAS</i> mutation			0.124
No	99 (78.6)	48 (67.6)	
Yes	27 (21.4)	23 (32.4)	
<i>PIK3CA</i> mutation			0.655
No	55 (43.7)	34 (47.9)	
Yes	71 (56.4)	37 (52.1)	
<i>TP53</i> mutation			0.0009
No	117 (92.9)	53 (74.7)	
Yes	9 (7.1)	18 (25.4)	
<i>PTEN</i> mutation			0.466
No	24 (19.1)	17 (23.9)	
Yes	102 (81.0)	54 (76.1)	

1. Difference in proportion compared using Fisher's exact test.

Table S9.2. Association between MS7 Level, CTNNB1 Mutation Status and TP53 Mutation Status in TCGA			
	TP53 Mutation	CTNNB1 Mutation	
		No	Yes
MS7 Low Patients	No	63 (88.7)	54 (98.2)
	Yes	8 (11.3)	1 (1.8)
MS7 High Patients	No	39 (73.6)	14 (77.8)
	Yes	14 (26.4)	4 (22.2)
All Patients	No	102 (82.3)	68 (93.2)
	Yes	22 (17.7)	5 (6.9)

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S10. Evaluations for the MS7 Classifier, Molecular Subtypes and Other Molecular Features

This section shows the significant relationship observed between categorized MS7 score and the aggressive molecular subtypes as defined by the Cancer Genome Atlas (TCGA) Research Network using cases from the Uterine Corpus Endometrial Carcinoma (UCEC) project. **Table S10.1** shows the relationship in the stage I, IIIC or IV cases from TCGA in Training-1 and Validation -1 cohorts with molecular subtype data. The results from **Table S10.1** was presented in the manuscript. **Table S10.2** shows the relationship in all the endometrioid endometrial cancer cases in the TCGA UCEC project with molecular subtype data. **Table S10.3** then displays the relationship with the MS7 classifier or the SCNA Cluster 4 Subtype and nodal and distant metastasis in the stage I, IIIC, or IV cases from TCGA in Training-1 and Validation -1 cohorts with molecular subtype data. The relationship between different biomarkers evaluated by transcript expression categorized by the median or mutation status and either the MS7 classifier categorized using the optimal RNA sequencing-based transcript or with nodal and distant metastasis are displayed in **Table S10.4** for cases in Training-1 or in **Table S10.5** for cases in Validation-1 from TCGA.

Table S10.1 Association of MS7 with TCGA Molecular Subtypes in Stage I, IIIC or IV Endometrioid Endometrial Cancers in the Training-1 or Validation -1 Cohorts				
	MS7 Low with Cases (%)	MS7 High with Cases (%)	OR (95% C.I.)	<i>P</i> value ¹
CNV High				0.072
No	93 (94.9)	49 (86.0)		
Yes	5 (5.1)	8 (14.0)	3.04 (0.94 – 9.78)	
SCNA Cluster 4				0.015
No	124 (92.5)	83 (81.4)		
Yes	10 (7.5)	19 (18.6)	2.84 (1.26 – 6.41)	
Mitotic				<0.0001
No	111 (91.7)	52 (53.6)		
Yes	10 (8.3)	23 (46.4)	9.61 (4.49 – 20.55)	

Copy number variant (CNV), somatic copy number alterations (SCNA)

1. Difference in proportion compared using Fisher's exact test.

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Table S10.2. Association of MS7 with TCGA Molecular Subtypes in Stage I-IV Endometrioid Endometrial Cancer Cases				
	MS7 Low with Cases (%)	MS7 High with Cases (%)	OR (95% C.I.)	<i>P</i> value ¹
CNV High				0.027
No	114 (95.0)	56 (84.9)		
Yes	6 (5.0)	10 (15.2)	3.39 (1.17 – 9.81)	
SCNA Cluster 4				0.002
No	154 (93.3)	105 (81.4)		
Yes	11 (6.7)	24 (18.6)	3.20 (1.50 – 6.81)	
Mitotic				<0.0001
No	139 (92.7)	63 (52.1)		
Yes	11 (7.3)	58 (47.9)	11.63 (5.72 – 23.66)	

Copy number variant (CNV), somatic copy number alterations (SCNA)

1. Difference in proportion compared using Fisher's exact test.

Table S10.3 the relationship with the MS7 classifier or the Copy Number Variant (CNV) High Subtype and nodal and distant metastasis in the in the stage I, IIIC or IV cases from TCGA in Training-1 and Validation -1 cohorts with molecular subtype data.			
	Metastasis		
	No. (%)	No. (%)	<i>P</i> value
MS7 Group			<0.0001
Low	96 (98.0)	2 (2.0)	
High	38 (66.7)	19 (33.3)	
TCGA Subtype			0.387
Non-CNV high	124 (87.3)	18 (12.7)	
CNV high	10 (76.9)	3 (23.1)	

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Table S10.4. The relationship between cancer biomarkers or aggressive molecular subtypes with either MS7 metastasis score based on RNA sequencing data or with nodal and distant metastasis in stage I, stage IIIC or IV endometrioid endometrial cancers from the Cancer Genome Atlas Uterine Corpus Endometrial Cancer Research Network (Training-1)

	MS7 Score			Nodal or Distant Metastasis			
	Low	High	<i>P-value</i>	No	Yes	<i>P-value</i>	AUC (95% CI)
Low MS7 Score	25	-	-	23	2	<0.001	0.87 (0.79-0.96)
High MS7 Score	-	50		6	44		
Low <i>ESR1</i> Transcripts	10	35	0.023	12	33	0.015	0.65 (0.54-0.76)
High <i>ESR1</i> Transcripts	15	15		17	13		
Low <i>ARID1A</i> Transcripts	18	25	0.086	17	26	1.000	0.51 (0.39-0.63)
High <i>ARID1A</i> Transcripts	7	25		12	20		
Low <i>CTNNB1</i> Transcripts	18	23	0.049	18	23	0.348	0.56 (0.44-0.68)
High <i>CTNNB1</i> Transcripts	7	27		11	23		
Low <i>KRAS</i> Transcripts	15	19	0.088	17	17	0.096	0.61 (0.49-0.72)
High <i>KRAS</i> Transcripts	10	31		12	29		
Low <i>MKI67</i> Transcripts	15	15	0.023	15	15	0.146	0.60 (0.48-0.71)
High <i>MKI67</i> Transcripts	10	35		14	31		
Low <i>PIK3CA</i> Transcripts	17	15	0.003	16	16	0.098	0.60 (0.49-0.72)
High <i>PIK3CA</i> Transcripts	8	35		13	30		
No <i>ARID1A</i> Mutation	9	14	0.523	8	15	0.200	0.62 (0.46-0.77)
<i>ARID1A</i> Mutation	9	8		10	7		
No <i>CTNNB1</i> mutation	10	16	0.327	11	15	0.744	0.54 (0.38-0.69)
<i>CTNNB1</i> Mutation	8	6		7	7		
No <i>KRAS</i> Mutation	14	14	0.491	12	16	0.739	0.53 (0.38-0.68)
<i>KRAS</i> Mutation	4	8		6	6		
No <i>PIK3CA</i> Mutation	6	12	0.216	6	12	0.216	0.61 (0.45-0.76)
<i>PIK3CA</i> Mutation	12	10		12	10		
No <i>TP53</i> Mutation	15	17	0.709	16	16	0.258	0.58 (0.46-0.70)
<i>TP53</i> Mutation	3	5		2	6		
No <i>PTEN</i> Mutation	1	8	0.027	2	7	0.149	0.60 (0.48-0.73)
<i>PTEN</i> Mutation	17	14		16	15		
Non-CNV High Subtype	16	18	0.613	16	18	0.613	0.54 (0.45-0.64)
CNV High Subtype	1	3		1	3		
Non-SCNA Cluster 4 Subtype	22	33	0.303	25	30	0.177	0.58 (0.49-0.66)
SCNA Cluster 4 Subtype	2	9		2	9		
Non-Mitotic Subtype	17	19	0.008	18	18	0.071	0.62 (0.50-0.74)
Mitotic Subtype	4	23		7	20		

MS7 score was categorized as low < -2.00356 (optimal RNA sequencing score) and high with ≥ -2.00356 . Transcripts categorized at the median with low < median and high as \geq median. Relationships between categorized variables were evaluated using Fisher' exact method. Relationship with metastasis was also evaluated using area of curve (AUC) with 95% confidence interval (CI) displayed from receiver operator characteristics curve for nodal and distant metastasis. Significant relationships with *P-value* <0.05 were highlighted in bold.

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Table S10.5. Relationships between cancer biomarkers or aggressive molecular subtypes with either MS7 metastasis score based on RNA sequencing data or with metastasis in stage I, IIIC, or IV endometrioid endometrial cancers from the Cancer Genome Atlas Uterine Corpus Endometrial Cancer Research Network (Validation-1).

	MS7 Score			Nodal or Distant Metastasis			
	Low	High	<i>P-value</i>	No	Yes	<i>P-value</i>	AUC (95% CI)
Low MS7 Score	142	-	-	141	1	0.072	0.71 (0.51-0.91)
High MS7 Score	-	88		84	4		
Low <i>ESR1</i> Transcripts	55	53	0.002	105	3	0.668	0.57 (0.32-0.81)
High <i>ESR1</i> Transcripts	87	35		120	2		
Low <i>ARID1A</i> Transcripts	74	36	0.105	106	4	0.196	0.66 (0.46-0.86)
High <i>ARID1A</i> Transcripts	68	52		119	1		
Low <i>CTNNB1</i> Transcripts	77	34	0.030	107	4	0.199	0.66 (0.46-0.86)
High <i>CTNNB1</i> Transcripts	65	54		118	1		
Low <i>KRAS</i> Transcripts	87	32	<0.001	116	3	1.000	0.54 (0.30-0.78)
High <i>KRAS</i> Transcripts	55	56		109	2		
Low <i>MKI67</i> Transcripts	91	32	<0.001	122	1	0.186	0.67 (0.47-0.87)
High <i>MKI67</i> Transcripts	51	56		103	4		
Low <i>PIK3CA</i> Transcripts	91	29	<0.001	117	3	1.000	0.54 (0.30-0.78)
High <i>PIK3CA</i> Transcripts	51	59		108	2		
No <i>ARID1A</i> Mutation	55	20	0.241	75	0	-	-
<i>ARID1A</i> Mutation	31	18		49	0		
No <i>CTNNB1</i> mutation	51	28	0.157	79	0	-	-
<i>CTNNB1</i> Mutation	35	10		45	0		
No <i>KRAS</i> Mutation	67	25	0.184	92	0	-	-
<i>KRAS</i> Mutation	19	13		32	0		
No <i>PIK3CA</i> Mutation	40	18	1.000	58	0	-	-
<i>PIK3CA</i> Mutation	46	20		66	0		
No <i>TP53</i> Mutation	81	29	0.010	110	0	-	-
<i>TP53</i> Mutation	5	9		14	0		
No <i>PTEN</i> Mutation	18	7	0.813	25	0	-	-
<i>PTEN</i> Mutation	68	31		99	0		
Non-CNV High Subtype	77	31	0.131	108	0	-	-
CNV High Subtype	4	5		9	0		
Non-SCNA Cluster 4 Subtype	102	50	0.070	152	0	-	-
SCNA Cluster 4 Subtype	8	10		18	0		
Non-Mitotic Subtype	94	33	<0.001	127	0	-	-
Mitotic Subtype	6	22		28	0		

MS7 score was categorized as low < -2.00356 (optimal RNAseq score) and high with ≥ -2.00356 . Transcripts categorized as low < median or high \geq median. Relationships between categorized variables were evaluated using Fisher's exact method. Relationship with metastasis was evaluated using area of curve (AUC) with a 95% confidence interval (CI) displayed from receiver operator characteristics curve for nodal and distant metastasis. Significance set at ($P < 0.05$ was highlighted in bold).

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S11. Differential Gene Expression in Training-1 Patients with Extreme MS7 Scores

Training-1 patients were first categorized based on MS7 score. Table S9 provides a summary of the genes that were either significantly down regulated or upregulated with a log2 ratio of gene expression less than -2 or greater than +2 in patients with an upper quartile (Q4) vs. a lower quartile (Q1) MS7 score for nodal/distant metastasis, respectively. “Curated Gene Symbol” lists TCGA gene identifiers that were hand-curated using public data sources, such as NCBI, to afford mapping of all significant differentially expressed genes in the Ingenuity Pathway Analysis (IPA) knowledgebase. “Gene symbol IPA” denotes IPA-mapped gene symbols.

Table S11. Differential Gene Expression in Training-1 Patients with Extreme MS7 Scores				
Curated Gene Symbol	Gene Symbol IPA	Entrez Gene Name	Q4 versus Q1 (Log ₂ Ratio Gene Expression)	q-value
IHH	IHH	indian hedgehog	-5.118	0.006136477
SCGB2A1	SCGB2A1	secretoglobin, family 2A, member 1	-4.627	0.005839523
C4BPA	C4BPA	complement component 4 binding protein, alpha	-4.594	0.0128412
MUC5B	MUC5B	mucin 5B, oligomeric mucus/gel-forming	-4.373	0.02280869
HP	HP	Haptoglobin	-4.193	0.02280869
MSX1	MSX1	msh homeobox 1	-4.153	0.00093901
SERPINA5	SERPINA5	serpin peptidase inhibitor, clade A (alpha-1 antiproteinase, antitrypsin), member 5	-3.936	0.0110201
PYY	PYY	peptide YY	-3.912	0.005133647
C1orf186	C1orf186	chromosome 1 open reading frame 186	-3.862	0.005590417
VWA3A	VWA3A	von Willebrand factor A domain containing 3A	-3.805	0.01136266
SAA1	SAA1	serum amyloid A1	-3.767	0.02941884
PIGR	PIGR	polymeric immunoglobulin receptor	-3.753	0.03403585
HPR	HPR	haptoglobin-related protein	-3.684	0.03047474
DNAJB13	DNAJB13	DnaJ (Hsp40) homolog, subfamily B, member 13	-3.656	0.007247798
SERPINA4	SERPINA4	serpin peptidase inhibitor, clade A (alpha-1 antiproteinase, antitrypsin), member 4	-3.655	0.02196197
SAA2	SAA2	serum amyloid A2	-3.62	0.03047474
MUC13	MUC13	mucin 13, cell surface associated	-3.487	0.01330222
LINC00930	LINC00930	long intergenic non-protein coding RNA 930	-3.439	0.002118548
HNF1B	HNF1B	HNF1 homeobox B	-3.438	0.02538975
SCGB3A1	SCGB3A1	secretoglobin, family 3A, member 1	-3.433	0.04138345
PAX8	PAX8	paired box 8	-3.402	0.01604042
CES3	CES3	carboxylesterase 3	-3.392	0.0177309
KIF12	KIF12	kinesin family member 12	-3.389	0.01561991
GABRP	GABRP	gamma-aminobutyric acid (GABA) A receptor, pi	-3.378	0.01616811
100130933	SMIM6	small integral membrane protein 6	-3.346	0.01604042
ALPPL2	ALPPL2	alkaline phosphatase, placental-like 2	-3.326	0.02803746

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WFDC2	WFDC2	WAP four-disulfide core domain 2	-3.302	0.0110201
DACT2	DACT2	dishevelled-binding antagonist of beta-catenin 2	-3.259	0.003307791
AMY1A	AMY1C (includes others)	amylase, alpha 1A (salivary)	-3.215	0.01651241
SPINLW1	EPPIN	epididymal peptidase inhibitor	-3.179	0.0106195
LIMS3	LIMS3/LIMS3L	LIM and senescent cell antigen-like domains 3	-3.161	0.005839523
C10orf81	PLEKHS1	pleckstrin homology domain containing, family S member 1	-3.147	0.03547051
C1orf173	ERICH3	glutamate-rich 3	-3.106	0.01651241
CSF3	CSF3	colony stimulating factor 3 (granulocyte)	-3.106	0.02396597
CCDC33	CCDC33	coiled-coil domain containing 33	-3.08	0.008275055
LIMS3-LOC440895	LIMS3-LOC440895	LIMS3-LOC440895 readthrough	-3.076	0.002204647
TRIM15	TRIM15	tripartite motif containing 15	-3.072	0.01962442
MMP7	MMP7	matrix metalloproteinase 7	-3.069	0.02062955
ALPP	ALPP	alkaline phosphatase, placental	-3.057	0.03935181
OVGP1	OVGP1	oviductal glycoprotein 1, 120kDa	-3.029	0.005839523
CCL20	CCL20	chemokine (C-C motif) ligand 20	-3.018	0.01975898
CLDN2	CLDN2	claudin 2	-2.927	0.02941884
TRIM31	TRIM31	tripartite motif containing 31	-2.885	0.03738103
C10orf107	C10orf107	chromosome 10 open reading frame 107	-2.878	0.009361028
DYNLRB2	DYNLRB2	dynein, light chain, roadblock-type 2	-2.858	0.01304076
PGR	PGR	progesterone receptor	-2.856	0.04138345
PHYHD1	PHYHD1	phytanoyl-CoA dioxygenase domain containing 1	-2.849	0.006626255
HGD	HGD	homogentisate 1,2-dioxygenase	-2.848	0.04756977
ESR1	ESR1	estrogen receptor 1	-2.847	0.02280869
CAPS	CAPS	calcyphosine	-2.844	0.007795827
SLC47A1	SLC47A1	solute carrier family 47 (multidrug and toxin extrusion), member 1	-2.825	0.01975898
PLEKHG7	PLEKHG7	pleckstrin homology domain containing, family G (with RhoGef domain) member 7	-2.805	0.02538975
ADH6	ADH6	alcohol dehydrogenase 6 (class V)	-2.79	0.03845899
POU5F1B	POU5F1B	POU class 5 homeobox 1B	-2.788	0.005839523
C2orf62	CATIP	ciliogenesis associated TTC17 interacting protein	-2.783	0.01278143
C6orf97	CCDC170	coiled-coil domain containing 170	-2.775	0.01210502
STX19	STX19	syntaxin 19	-2.747	0.003759129
NXF3	NXF3	nuclear RNA export factor 3	-2.724	0.01604042
CXCL3	CXCL3	chemokine (C-X-C motif) ligand 3	-2.706	0.01426048
CCDC42B	CFAP73	cilia and flagella associated protein 73	-2.689	0.01651241
CCDC135	DRC7	dynein regulatory complex subunit 7	-2.668	0.03935181
CXCL2	CXCL2	chemokine (C-X-C motif) ligand 2	-2.667	0.01210502
TMEM211	TMEM211	transmembrane protein 211	-2.666	0.01330222
FAM166B	FAM166B	family with sequence similarity 166, member B	-2.663	0.04996141
CCDC108	CCDC108	coiled-coil domain containing 108	-2.657	0.02062955
TTL2	TTL2	tubulin tyrosine ligase-like family member 2	-2.609	0.009972617
RNF183	RNF183	ring finger protein 183	-2.606	0.009361028
TSIX	TSIX	TSIX transcript, XIST antisense RNA	-2.599	0.03047474
FUT6	FUT6	fucosyltransferase 6 (alpha (1,3) fucosyltransferase)	-2.589	0.02654826
C1orf194	C1orf194	chromosome 1 open reading frame 194	-2.585	0.04541916
ARSE	ARSE	arylsulfatase E (chondrodysplasia punctata 1)	-2.584	0.02941884
ACSL5	ACSL5	acyl-CoA synthetase long-chain family member 5	-2.58	0.01278143

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ASB12	ASB12	ankyrin repeat and SOCS box containing 12	-2.572	0.005839523
ST6GALNAC1	ST6GALNAC1	ST6 (alpha-N-acetyl-neuraminyl-2,3-beta-galactosyl-1,3)-N-acetylgalactosaminide alpha-2,6-sialyltransferase 1	-2.57	0.0435928
POU5F1	POU5F1	POU class 5 homeobox 1	-2.565	0.01210502
CACNA1I	CACNA1I	calcium channel, voltage-dependent, T type, alpha 1I subunit	-2.55	0.03738103
SAA4	SAA4	serum amyloid A4, constitutive	-2.548	0.04917746
UBQLNL	UBQLNL	ubiquilin-like	-2.54	0.004403746
USH1C	USH1C	Usher syndrome 1C	-2.537	0.04756977
CALN1	CALN1	calneuron 1	-2.526	0.02538975
ZMYND12	ZMYND12	zinc finger, MYND-type containing 12	-2.524	0.005839523
FOXJ1	FOXJ1	forkhead box J1	-2.516	0.02538975
IL19	IL19	interleukin 19	-2.511	0.04944049
LRRC50	DNAAF1	dynein, axonemal, assembly factor 1	-2.507	0.02803746
CCDC17	CCDC17	coiled-coil domain containing 17	-2.493	0.008275055
CTSE	CTSE	cathepsin E	-2.487	0.02771723
GGTLC2	GGTLC2	gamma-glutamyltransferase light chain 2	-2.485	0.00882525
RP1	RP1	retinitis pigmentosa 1 (autosomal dominant)	-2.468	0.02654826
COL28A1	COL28A1	collagen, type XXVIII, alpha 1	-2.467	0.003449271
DEFB4A	DEFB4A/DEFB4B	defensin, beta 4A	-2.467	0.03303572
UBXN10	UBXN10	UBX domain protein 10	-2.452	0.02062955
TNFSF12-TNFSF13	TNFSF12-TNFSF13	TNFSF12-TNFSF13 readthrough	-2.432	0.01136266
TGM3	TGM3	transglutaminase 3	-2.428	0.03047474
TP53AIP1	TP53AIP1	tumor protein p53 regulated apoptosis inducing protein 1	-2.405	0.01330222
ACY3	ACY3	aminoacylase 3	-2.404	0.01330222
C19orf33	C19orf33	chromosome 19 open reading frame 33	-2.392	0.04996141
TMED6	TMED6	transmembrane p24 trafficking protein 6	-2.389	0.007247798
TMEM101	TMEM101	transmembrane protein 101	-2.381	0.01210502
400891	DLG4	discs, large homolog 4 (Drosophila)	-2.377	0.02396564
SPDEF	SPDEF	SAM pointed domain containing ETS transcription factor	-2.376	0.0435928
C19orf18	C19orf18	chromosome 19 open reading frame 18	-2.356	0.008275055
NME5	NME5	NME/NM23 family member 5	-2.354	0.01517195
GLYATL1	GLYATL1	glycine-N-acyltransferase-like 1	-2.323	0.03114439
FUT3	FUT3	fucosyltransferase 3 (galactoside 3(4)-L-fucosyltransferase, Lewis blood group)	-2.32	0.03403585
CNGA4	CNGA4	cyclic nucleotide gated channel alpha 4	-2.318	0.02631624
KLKB1	KLKB1	kallikrein B, plasma (Fletcher factor) 1	-2.31	0.02621325
TEKT3	TEKT3	tektin 3	-2.302	0.002204647
SRD5A2	SRD5A2	steroid-5-alpha-reductase, alpha polypeptide 2 (3-oxo-5 alpha-steroid delta 4-dehydrogenase alpha 2)	-2.301	0.02941884
AMY2A	AMY2A	amylase, alpha 2A (pancreatic)	-2.297	0.0110201
NOXA1	NOXA1	NADPH oxidase activator 1	-2.295	0.001248518
VWA3B	VWA3B	von Willebrand factor A domain containing 3B	-2.287	0.04258637
BCL2L15	BCL2L15	BCL2-like 15	-2.277	0.02396564
EYA2	EYA2	EYA transcriptional coactivator and phosphatase 2	-2.272	0.03403585
SIGLEC15	SIGLEC15	sialic acid binding Ig-like lectin 15	-2.261	0.03738103
C3	NAD+		-2.26	0.03240097
UNC93A	UNC93A	unc-93 homolog A (C. elegans)	-2.251	0.02206378
ASRGL1	ASRGL1	asparaginase like 1	-2.242	0.01210502
284276	LINC00908	long intergenic non-protein coding RNA 908	-2.238	0.01210502

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STX18	STX18	syntaxin 18	-2.234	0.001608572
FGFR2	FGFR2	fibroblast growth factor receptor 2	-2.229	0.009972617
ABCA13	ABCA13	ATP-binding cassette, sub-family A (ABC1), member 13	-2.227	0.02396564
AMBP	AMBP	alpha-1-microglobulin/bikunin precursor	-2.198	0.04541916
AMY2B	AMY2B	amylase, alpha 2B (pancreatic)	-2.189	0.006249817
SPATA18	SPATA18	spermatogenesis associated 18	-2.189	0.01426048
HNF1A	HNF1A	HNF1 homeobox A	-2.188	0.01159343
CCDC129	CCDC129	coiled-coil domain containing 129	-2.188	0.04975449
DNAH6	DNAH6	dynein, axonemal, heavy chain 6	-2.181	0.02167748
DNAH9	DNAH9	dynein, axonemal, heavy chain 9	-2.163	0.04756977
SPATA17	SPATA17	spermatogenesis associated 17	-2.143	0.01517195
KIAA1324	KIAA1324	KIAA1324	-2.138	0.03047474
EMX2	EMX2	empty spiracles homeobox 2	-2.133	0.004001155
CASC1	CASC1	cancer susceptibility candidate 1	-2.124	0.03047474
GGTLC1	GGTLC1	gamma-glutamyltransferase light chain 1	-2.121	0.007247798
KISS1	KISS1	KiSS-1 metastasis-suppressor	-2.12	0.01874526
CUBN	CUBN	cubilin (intrinsic factor-cobalamin receptor)	-2.115	0.001248518
DLEC1	DLEC1	deleted in lung and esophageal cancer 1	-2.112	0.04541916
CFAP221	CFAP221	cilia and flagella associated protein 221	-2.108	0.04996141
PRSS33	PRSS33	protease, serine, 33	-2.107	0.02941884
LRRC46	LRRC46	leucine rich repeat containing 46	-2.104	0.02167748
TTC18	CFAP70	cilia and flagella associated protein 70	-2.092	0.01330222
APOL4	APOL4	apolipoprotein L, 4	-2.087	0.01159343
CRYBB1	CRYBB1	crystallin, beta B1	-2.084	0.03738103
OCA2	OCA2	oculocutaneous albinism II	-2.084	0.04684127
CFI	CFI	complement factor I	-2.079	0.01330222
TEKT4	TEKT4	tektin 4	-2.078	0.04756977
CPM	CPM	carboxypeptidase M	-2.076	0.02062955
KLK14	KLK14	kallikrein-related peptidase 14	-2.075	0.03738103
CYP3A5	CYP3A5	cytochrome P450, family 3, subfamily A, polypeptide 5	-2.075	0.04756977
TNNT2	TNNT2	troponin T type 2 (cardiac)	-2.06	0.01517195
LYPD1	LYPD1	LY6/PLAUR domain containing 1	-2.059	0.03935181
CD1A	CD1A	CD1a molecule	-2.052	0.01651241
SLC5A9	SLC5A9	solute carrier family 5 (sodium/sugar cotransporter), member 9	-2.041	0.008275055
AGBL2	AGBL2	ATP/GTP binding protein-like 2	-2.041	0.02538975
GGT1	GGT1	gamma-glutamyltransferase 1	-2.04	0.02654826
BCO2	BCO2	beta-carotene oxygenase 2	-2.037	0.006626255
NCRNA00116	LINC00116	long intergenic non-protein coding RNA 116	-2.037	0.03935181
LDLRAD2	LDLRAD2	low density lipoprotein receptor class A domain containing 2	-2.035	0.003219602
PCP2	PCP2	Purkinje cell protein 2	-2.031	0.009361028
C6orf41	LINC00240	long intergenic non-protein coding RNA 240	-2.027	0.01416221
C12orf27	HNF1A-AS1	HNF1A antisense RNA 1	-2.022	0.01604042
RSPH10B2	RSPH10B/RSPH10B2	radial spoke head 10 homolog B (Chlamydomonas)	-2.022	0.02167748
C10orf79	CFAP43	cilia and flagella associated protein 43	-2.021	0.02538975
C1orf88	PIFO	primary cilia formation	-2.02	0.04996141
TDGF1	TDGF1	teratocarcinoma-derived growth factor 1	-2.014	0.0435928
SEC16B	SEC16B	SEC16 homolog B, endoplasmic reticulum export factor	-2.004	0.004035443

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RAP1GAP	RAP1GAP	RAP1 GTPase activating protein	-2.002	0.03547051
POSTN	POSTN	periostin, osteoblast specific factor	2.018	0.0110201
FAM21A	FAM21A/FAM21C	family with sequence similarity 21, member C	2.107	0.02062955
PCDHGA3	PCDHGA3	protocadherin gamma subfamily A, 3	2.128	0.01159343
PCDHGA2	PCDHGA2	protocadherin gamma subfamily A, 2	2.147	0.01075619
GAS1	GAS1	growth arrest-specific 1	2.162	0.01777309
CBS	CBS/CBSL	cystathionine-beta-synthase	2.166	0.02538975
SLC6A17	SLC6A17	solute carrier family 6 (neutral amino acid transporter), member 17	2.234	0.02179432
MED12L	MED12L	mediator complex subunit 12-like	2.288	0.009972617
PCOLCE2	PCOLCE2	procollagen C-endopeptidase enhancer 2	2.312	0.03454013
PTGER3	PTGER3	prostaglandin E receptor 3 (subtype EP3)	2.37	0.01651241
CACNA2D1	CACNA2D1	calcium channel, voltage-dependent, alpha 2/delta subunit 1	2.381	0.01598562
FOXD1	FOXD1	forkhead box D1	2.384	0.01962442
KCNH2	KCNH2	potassium channel, voltage gated eag related subfamily H, member 2	2.485	0.02803746
HOXA13	HOXA13	homeobox A13	2.523	0.01651241
PTGIS	PTGIS	prostaglandin I2 (prostacyclin) synthase	2.571	0.01777309
EIF3C	EIF3C	eukaryotic translation initiation factor 3, subunit C	2.588	0.0332791
PDLIM3	PDLIM3	PDZ and LIM domain 3	2.594	0.005299897
GPC3	GPC3	glypican 3	2.649	0.01159343
PCSK1	PCSK1	proprotein convertase subtilisin/kexin type 1	2.72	0.04530378
CHRD1	CHRD1	chordin-like 1	2.844	0.02894284
SIX2	SIX2	SIX homeobox 2	2.896	0.02538975
CHRD2	CHRD2	chordin-like 2	2.919	0.01210502
BIRC5	BIRC5	baculoviral IAP repeat containing 5	3.262	0.007247798

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S12. Enriched Pathways in Training-1 Patients with Extreme MS7 Scores

Table S12 provides a summary of the top 25 enriched molecular pathways with significant differentially expressed genes in Training-1 patients with extreme MS7 classifier scores (upper quartile [Q4] vs. lower quartile [Q1]. A $-\log p\text{-value} \geq 2.0$). Z-score denotes putative pathway activation state 1. Decreased and elevated columns denote the number and percent of enriched genes decreased or elevated in the patients with a Q4 vs. Q1 MS7 score for a given pathway of interest. No overlap denotes the number and percent of canonical pathway genes not enriched in the primary dataset. Significant genes indicate specific data set enriched genes for each pathway.

Table S12. Enriched Pathways in Training-1 Patients with Extreme MS7 Scores						
Canonical Pathways	$-\log(P\text{-value})$	z-score	Decreased	Elevated	No Overlap	Significant Genes
EIF2 Signaling	9.71	-3.024	28/187 (15%)	13/187 (7%)	146/187 (78%)	RPL11, RAF1, RPL22, PIK3CA, EIF3C, RPL39, RPLP2, PIK3R4, EIF4G1, EIF2S1, RPS4X, RPL27A, RPL13, EIF5, RPS9, RPL19, RPS2, GSK3B, RPS3, MAP2K1, RPL18, GRB2, RPL34, RPL17, RPS8, RPL29, AGO2, RPL23, RPL12, EIF2S2, RPL28, RPL9, RPS6, RPL15, RPS15, EIF4A3, RPL10, RPS25, RPL37, RPL6, RPL13A
Cell Cycle Control of Chromosomal Replication	5.84	NaN	0/27 (0%)	11/27 (41%)	16/27 (59%)	MCM3, MCM6, CDC45, MCM2, CDT1, CDK4, RPA1, MCM4, CDK2, MCM7, ORC1
Role of BRCA1 in DNA Damage Response	5.57	1.732	0/78 (0%)	19/78 (24%)	59/78 (76%)	ARID1A, TOPBP1, FANCG, BARD1, MDC1, RPA1, RFC1, PLK1, FANCE, RAD51, RFC4, FANCD2, MSH2, E2F1, MSH6, FAAP24, RFC2, BRIP1, HLTf
Mismatch Repair in Eukaryotes	4.72	NaN	0/18 (0%)	8/18 (44%)	10/18 (56%)	PCNA, MSH2, RFC4, MSH6, RFC2, FEN1, RFC1, RPA1
Hereditary Breast Cancer Signaling	4.55	NaN	2/131 (2%)	22/131 (17%)	107/131 (82%)	PIK3CA, ARID1A, POLR2D, GADD45B, HDAC8, FANCG, BARD1, CDK4, RPA1, RFC1, PIK3R4, RAD51, FANCE, PALB2, HDAC3, FANCD2, MSH2, RFC4, XPC, E2F1, MSH6, FAAP24, RFC2, HLTf
Role of CHK Proteins in Cell Cycle Checkpoint Control	3.86	0.816	0/55 (0%)	13/55 (24%)	42/55 (76%)	PCNA, RFC4, PPP2R2A, PPP2R5D, E2F1, RFC2, MDC1, CLSPN, PLK1, RFC1, RPA1, CDK2, CDC25A
Estrogen Receptor Signaling	3.80	NaN	7/128 (5%)	15/128 (12%)	106/128 (83%)	MED18, MED12L, RAF1, PRKDC, POLR2D, GRB2, MED1, TBP, TAF10, GTF2A1, G6PC3, MED14, PGR, HDAC3, CDK8, TAF4, MED15, TRRAP, ERCC3, GTF2H5, MAP2K1, ESR1
Estrogen-mediated S-phase Entry	3.67	1.414	1/24 (4%)	7/24 (29%)	16/24 (67%)	CCNA2, E2F1, CDK4, CDKN1B, ESR1, CDK2, SKP2, CDC25A
IL-17A Signaling in Airway Cells	3.58	1	8/66 (12%)	6/66 (9%)	52/66 (79%)	PIK3CA, CCL20, IKBKE, IL17RA, PIK3R4, IL19, CXCL3, MAPK14, TRAF3IP2, NFKBIA, MUC5B, GSK3B, DEFB4A/DEFB4B, MAP2K1

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Mitotic Roles of Polo-Like Kinase	3.58	0	2/66 (3%)	12/66 (18%)	52/66 (79%)	KIF23, ESPL1, PPP2R2A, PPP2R5D, PRC1, CDC23, PLK1, SMC1A, ANAPC4, HSP90AB1, FBXO5, CDC16, RAD21, CDC25A
Regulation of eIF4 and p70S6K Signaling	3.20	0.707	9/150 (6%)	14/150 (9%)	127/150 (85%)	RAF1, EIF3C, PIK3CA, GRB2, PPP2R2A, PPP2R5D, RPS8, AGO2, PIK3R4, EIF4G1, EIF2S1, RPS4X, EIF2S2, RPS6, RPS15, MAPK14, EIF4EBP3, EIF4A3, RPS9, RPS25, RPS2, RPS3, MAP2K1
Protein Ubiquitination Pathway	2.84	NaN	12/259 (5%)	21/259 (8%)	226/259 (87%)	USP14, DNAJC17, HSPA14, PSMA7, PSMB10, CDC23, DNAJC10, USP39, DNAJB13, USP13, HSP90AB1, DNAJC4, USP40, DNAJC22, BIRC3, HSPA4L, DNAJB12, PSMD13, USP9X, HSPA9, USP19, USP1, PSMD3, PSMD8, SKP2, HSPA8, ANAPC4, PSMD11, HSCB, UBE2G1, PSMD2, PSMD1, VHL
Cyclins and Cell Cycle Regulation	2.81	0	1/78 (1%)	13/78 (17%)	64/78 (82%)	RAF1, HDAC8, PPP2R2A, PPP2R5D, CDK4, SKP2, CCNA2, HDAC3, E2F1, TGFB3, CDKN1B, GSK3B, CDK2, CDC25A
NRF2-mediated Oxidative Stress Response	2.79	2.309	10/180 (6%)	15/180 (8%)	155/180 (86%)	AKR7A2, RAF1, USP14, DNAJC17, PIK3CA, DNAJB12, PPIB, DNAJC10, JUNB, PIK3R4, DNAJB13, MAFG, GSR, FOS, MAPK14, MGST2, DNAJC4, STIP1, DNAJA3, GSK3B, FKBP5, MAP2K1, HACD3, MAP2K5, GSTK1
BER pathway	2.78	NaN	0/13 (0%)	5/13 (38%)	8/13 (62%)	PCNA, POLG, FEN1, OGG1, PARP1
Assembly of RNA Polymerase III Complex	2.78	NaN	1/13 (8%)	4/13 (31%)	8/13 (62%)	GTF3C4, TBP, SF3A1, BRF1, POLR3D
Adipogenesis pathway	2.68	NaN	8/135 (6%)	12/135 (9%)	115/135 (85%)	ATG7, KAT7, HDAC8, TNFRSF1A, HAT1, SAP30L, FGFR2, SAP130, SENP2, SAP30, BSCL2, FGF1, HDAC3, PAXIP1, KAT6A, AGPAT2, EZH2, ERCC3, GTF2H5, RBBP4
IL-17A Signaling in Fibroblasts	2.48	NaN	5/35 (14%)	3/35 (9%)	27/35 (77%)	FOS, MAPK14, TRAF3IP2, NFKBIA, IKBKE, GSK3B, NFKBIZ, IL17RA
p53 Signaling	2.28	-1.667	2/98 (2%)	13/98 (13%)	83/98 (85%)	PRKDC, TP53AIP1, PIK3CA, GADD45B, MED1, TOPBP1, CDK4, PIK3R4, BIRC5, PCNA, MAPK14, E2F1, GSK3B, CTNNB1, CDK2
Molecular Mechanisms of Cancer	2.18	NaN	12/373 (3%)	29/373 (8%)	332/373 (89%)	RAF1, GAB2, PIK3CA, PSENEN, ADCY4, GNA11, CDK4, BMPR1B, PIK3R4, NFKBIA, FANCD2, GNA15, PLCB1, GSK3B, CTNNB1, MAP2K1, BIRC3, CDC25A, PRKDC, STK36, GRB2, HAT1, ARHGEF15, ADCY3, PRKAR2A, AURKA, RAC3, FOS, DAXX, MAPK14, RHOA, E2F1, TGFB3, PLCB3, IHH, CDKN1B, ELK1, GNA1, CDK2, CAMK2G, PSEN1
Cell Cycle: G1/S Checkpoint Regulation	2.18	-1	2/64 (3%)	9/64 (14%)	53/64 (83%)	RPL11, HDAC3, HDAC8, E2F1, CDK4, TGFB3, CDKN1B, GSK3B, CDK2, SKP2, CDC25A
Acute Phase Response Signaling	2.13	0.258	16/171 (9%)	6/171 (4%)	149/171 (87%)	RAF1, SERPING1, PIK3CA, HPX, ITIH3, TNFRSF1A, GRB2, AMBP, IKBKE, SAA2, SAA4, HNF1A, FOS, KLKB1, IL18, HP, MAPK14, NFKBIA, C4BPA, SAA1, ELK1, MAP2K1
Chronic Myeloid Leukemia Signaling	2.10	NaN	2/93 (2%)	12/93 (13%)	79/93 (85%)	RAF1, GAB2, PIK3CA, HDAC3, HDAC8, GRB2, CRKL, E2F1, TGFB3, CDK4, IKBKE, CDKN1B, PIK3R4, MAP2K1
Aldosterone Signaling in Epithelial Cells	2.09	1.667	9/162 (6%)	12/162 (7%)	141/162 (87%)	RAF1, DNAJC17, PIK3CA, DNAJB12, HSPA14, PDIA3, HSPA9, DNAJC10, PIK3R4, DNAJB13, HSPA8, HSP90AB1, DNAJC4, HSCB, PLCB3, PLCB1, DNAJC22, MAP2K1, PIP4K2C, PI4KA, HSPA4L
PPAR α /RXR α Activation	2.08	-1.265	8/183 (4%)	15/183 (8%)	160/183 (87%)	RAF1, PRKAB1, GRB2, MED1, PDIA3, CPT1B, ADCY4, ADCY3, GNA11, PRKAR2A, NCOA6, IKBKE, TGS1, CAND1, MAPK14, NFKBIA, HSP90AB1, GNA15, FASN, TGFB3, PLCB3, PLCB1, MAP2K1

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S13. Pathway Analyses of Differentially Expressed Transcripts in Endometrioid

Endometrial Cancer Patients Classified with High versus Low Risk of Metastasis.

In Figure 4, data reflects the percent contribution of transcripts to enriched canonical pathways that are elevated (highlighted red) or decreased (highlighted green) in high versus low risk patients. Predicted activation states of canonical pathways are based on abundance trends of associated transcripts relative to the putative functional role of associated candidates in the pathway of interest. Pathways predicted to be activated (highlighted orange, $z\text{-score} \geq 1.0$) or inhibited (highlighted blue, $z\text{-score} \leq -1.0$) are further denoted. Canonical pathways are ranked by most (EIF2 Signaling) to least (PPAR α / RXR α Activation) significantly enriched. Pathway analyses was performed using Ingenuity Pathway Analysis software (Qiagen). Although an inverse relationship was observed between MS7 score and ESR1 transcript expression, functional pathway analysis suggests that estrogen signaling pathways continue to function as potential drivers in patients with metastatic disease, possibly by ligand-dependent and independent signaling mechanisms, such as via AKT-dependent regulation of ESR1. Pathways predicted to be activated in Q4 patients included regulation of DNA damage response (DDR) and steroid hormone signaling, i.e. aldosterone and estrogen-mediated S-phase entry signaling. BRCA1-associated DDR signaling was further predicted to be activated in Q4 patient tissues suggesting that patients with metastatic disease have increased homologous recombination DNA repair activities as this DDR mechanism is commonly associated with BRCA1 function. Enrichment of DNA replication and orthogonal DNA repair pathways corresponded with elevations of the cell proliferation marker MKI67 in the metastatic patients (0.982, Log2 fold-change, q-value = 0.03). Pathways predicted to be inhibited in Q4 patient tissues include p53 signaling as well as G1/S checkpoint regulation. TBRG1, a member of the MS7 risk score, has been shown to promote TP53 activation and may

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lead to impaired TP53 signaling in metastatic patients. Table S8 highlights the differentially expressed genes in Q4 vs. Q1 patients with the most extreme fold changes.

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Supplement S1 to S15

S14. Stage Distribution of RNA Sequencing-Based MS7 Score

Figure S14 illustrates the stage distribution of MS7 Scores in endometrioid endometrial cancer patients from the UCEC TCGA Research Network.

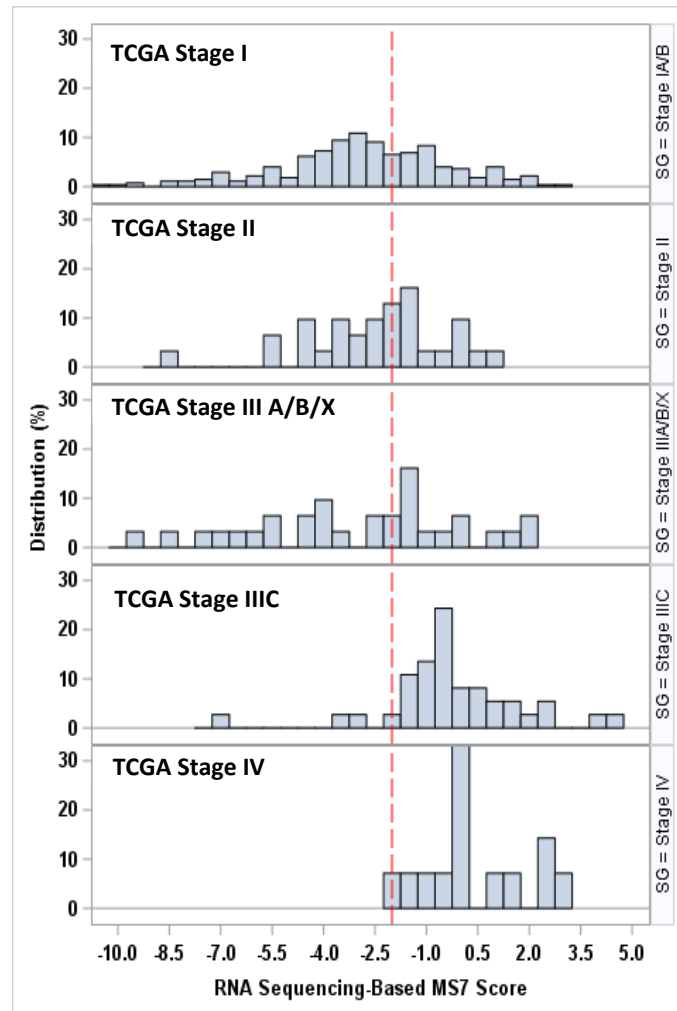


Figure S14. The distribution of 389 endometrioid endometrial cancer (EEC) patients from the Cancer Genome Atlas (TCGA) Uterine Corpus Endometrial Carcinoma (UCEC) Research Network by stage and MS7 score with the optimal cut-point indicated using a red dashed line.

Supplement S1 to S15

S15. Additional Characteristics of the Cohorts and Exploratory Evaluations of the Potential Prognostic Relevance of the MS7 Classifier

This section starts with additional characteristics for the Training and Validation Cohorts (**Table S15.1**). The relationship between high relative low RNA sequencing based MS7 score and measures of clinical outcome including progression-free survival and overall survival are displayed in **Table S15.2** using unadjusted, stage adjusted or fully adjusted Cox analyses. The fully adjusted Cox analyses included corrections for age, stage and tumor grade. Additional analyses of progression-free survival were performing using the MS7 classifier and clinical characteristics with adjuvant treatment (S15.3) or without adjuvant treatment (**Table S15.4**). **Table S15.5** compares the prediction of disease progression using the clinical variables compared with the clinical variables and the MS7 classifier. **Table S15.6** shows the relationship between different biomarkers including the MS7 classifier and progression-free survival in all the endometrioid endometrial cancer patients from the Cancer Genome Atlas (TCGA) Research Network in the Uterine Corpus Endometrial Carcinoma (UCEC) project.

Supplement S15.1 Treatment and outcome characteristics for the endometrioid endometrial cancer patients with stage I, IIIC or IV disease and RNA sequencing data or Affymetrix Plus 2.0 microarray data.				
	RNA Sequencing Data		Affymetrix Microarray Data	
	Training-1	Validation-1	Training-2	Validation-2
Treatment				
No Adjuvant Therapy	28 (37.3)	134 (58.3)	-	-
Endocrine Therapy	1 (1.3)	3 (1.3)	-	-
Radiotherapy (RT)	9 (12.0)	64 (27.8)	-	-
Chemotherapy	14 (18.7)	6 (2.6)	-	-
Chemotherapy and RT	23 (30.7)	23 (10.0)	-	-
Unknown	-	15	64	81
Progression within 60 months				
No Progression	37 (59.7)	179 (82.9)	51 (79.7)	-
Progression	25 (40.3)	37 (17.1)	13 (20.3)	-
Not Evaluable or Missing	13	14		81
Survival within 60 months				
Alive	60 (80.0)	212 (92.2)	48 (75.0)	-
Dead	15 (20.0)	18 (7.80)	16 (25.0)	-
Unknown	-	15	-	81
Criteria for the stage I cases in the training compared with the validation cohorts was strict for the former and loose for the later (see Methods for details). Interquartile range [IQR]. Percent provided in parentheses.				

Supplement S1 to S15

Table S15.2. Relationship between High relative to Low MS7 Score and Clinical Outcomes including Progression-Free Survival and Overall Survival in Women with Stage I-IV Endometrioid Endometrial Cancer from the Cancer Genome Atlas (TCGA) Research Network Uterine Corpus Endometrial Carcinoma (UCEC) Project

Type of Clinical Outcome	Type of Cox Model	Hazard Ratio (95% Confidence Interval)
Progression-Free Survival	Unadjusted	2.51 (1.59 – 3.95)
	Stage Adjusted	1.87 (1.13 – 3.07)
	Fully Adjusted	1.89 (1.05 – 3.42)
Overall Survival	Unadjusted	2.48 (1.35 – 4.56)
	Stage Adjusted	1.63 (0.83 – 3.21)
	Fully Adjusted	1.10 (0.49 – 2.46)

Stage classified as: Stage I vs. Stage II vs. Stage III vs. Stage IV. Tumor grade (G) classified as: G1 vs. G2 vs. G3. Myometrial Invasion (MI) classified as 0-50% vs. ≥50%. Unadjusted hazard ratio and 95% confidence interval estimated from Cox model without control for other variables. Stage-adjusted hazard ratio and 95% confidence interval estimated from Cox model with control for stage. Fully adjusted hazard ratio and 95% confidence interval estimated from Cox model with control for age (continuous variable), stage, tumor grade and MI.

Table S15.3 Association between Clinical Variables and MS7 with Progression-free Survival (PFS) in Endometrioid Endometrial Cases from the Cancer Genome Atlas (TCGA) Provided Adjuvant Treatment.

	Univariate Analysis		Multivariate Analysis	
	HR (95% C.I.)	P value	HR (95% C.I.)	P value
Age (years)				
≥65 vs. <65	1.17 (0.75 – 1.83)	0.479	1.40 (0.84 – 2.31)	0.195
Stage				
Advanced vs. Early	2.91 (1.86 – 4.54)	<0.0001	2.11 (1.25 – 3.59)	0.006
Tumor Grade				
High vs. Low	1.76 (1.12 – 2.75)	0.014	0.95 (0.55 – 1.64)	0.857
MI				
≥50% vs. <50%	1.90 (1.17 – 3.06)	0.009	1.42 (0.87 – 2.34)	0.164
Adjuvant Treatment				
Yes vs. No	2.77 (1.67 – 4.60)	<0.0001	1.80 (0.97 – 3.33)	0.062
MS7				
High vs. Low	2.53 (1.60 – 3.99)	<0.0001	1.93 (1.08 – 3.47)	0.027

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Table S15.4 Association between Clinical Variables and MS7 with Progression-free Survival (PFS) in Endometrioid Endometrial Cases from the Cancer Genome Atlas (TCGA) Not Given Adjuvant Treatment.

	Univariate Analysis		Multivariate Analysis	
	HR (95% C.I.)	P value	HR (95% C.I.)	P value
Age (years)				
≥65 vs. <65	1.17 (0.75 – 1.83)	0.479	1.29 (0.78 – 2.12)	0.317
Stage				
Advanced vs. Early	2.91 (1.86 – 4.54)	<0.0001	2.50 (1.49 – 4.17)	0.005
Tumor Grade				
High vs. Low	1.76 (1.12 – 2.75)	0.014	1.00 (0.58 – 1.71)	0.989
MI				
≥50% vs. <50%	1.90 (1.17 – 3.06)	0.009	1.56 (0.85 – 2.55)	0.076
MS7				
High vs. Low	2.53 (1.60 – 3.99)	<0.0001	2.03 (1.13 – 3.65)	0.019

Table S15.5 Prediction of Disease Progression based on Clinical Variables Compared to Clinical with the MS7 Classifier

	Predictors	Likelihood Ratio χ^2	CPE
Model 1	clinical variables (age + stage + tumor grade + MI)	27.854	0.647
Model 2	clinical variables (age + stage + tumor Grade + MI) + MS7	33.486	0.667

Difference in likelihood ratio χ^2 between two models: $\Delta\chi^2 = 5.632$, $p=0.018$.

Table S15.6 Association between ARID1A, CTNNB1, MKI67, ESR1 and MS7 with Progression-free Survival (PFS) in the Stage I-IV Endometrioid Endometrial Cases from the Cancer Genome Atlas (TCGA) including those who did and did not receive adjuvant treatment.

	Univariate Analysis		Multivariate Analysis	
	HR (95% C.I.)	P value	HR (95% C.I.)	P value
ARID1A	0.96 (0.78 – 1.20)	0.729	0.86 (0.62 – 1.19)	0.370
CTNNB1	0.99 (0.80 – 1.22)	0.892	0.95 (0.74 – 1.20)	0.652
MKI67	1.27 (1.01 – 1.59)	0.043	1.10 (0.86 – 1.41)	0.444
ESR1	1.36 (1.13 – 1.65)	0.001	1.20 (0.97 – 1.49)	0.086
MS7	1.51 (1.18 – 1.94)	0.001	1.39 (1.03 – 1.87)	0.029

HR estimated for increasing one standard deviation (SD) of ARID1A, CTNNB1, MKI67, MS7, or decreasing one SD of ESR1.