

**Table S1** Baseline characteristics of the patients in training set I and test set I

Characteristic	Training set I (n=254)	Test set I (n=64)	P-value
Age			0.474 <sup>#</sup>
Mean (SD)	43.2 (5.90)	42.6 (5.63)	
Tumor size			0.727 <sup>##</sup>
≤2 cm	74 (29.1%)	19 (29.7%)	
>2 cm & ≤5 cm	143 (56.3%)	34 (53.1%)	
>5 cm	33 (13.0%)	11 (17.2%)	
Unknown	4 (1.6%)	0 (0.00%)	
Nodal status			0.185 <sup>##</sup>
Negative	108 (42.5%)	24 (37.5%)	
Positive	146 (57.5%)	39 (60.9%)	
Unknown	0 (0.00%)	1 (1.56%)	
Hormone receptor status			0.582 <sup>#</sup>
Negative	58 (22.8%)	11 (17.2%)	
Positive	127 (50.0%)	33 (51.6%)	
Unknown	69 (27.2%)	20 (31.2%)	
Overall survival event			1.000 <sup>#</sup>
Alive	222 (87.4%)	56 (87.5%)	
Dead	32 (12.6%)	8 (12.5%)	
Overall survival time			0.491 <sup>#</sup>
Mean (SD)	57.3 (46.5)	53.3 (40.7)	

P-value was generated from comparison of sample characteristics between training set I and test set I. #, Pearson's Chi Square test; ##, Fisher's Exact test.

**Table S2** OS-related CpGs selected by univariable Cox proportional hazards regression analysis

CpG site	Hazard ratio	95% Confidence Interval	P-value
cg00294550	0.067	0.016-0.282	0.000E+00
cg00091633	0.011	0.001-0.140	0.000E+00
cg00431813	0.009	0.001-0.123	0.000E+00
cg00495775	0.071	0.014-0.359	1.000E-03
cg00778807	0.081	0.022-0.303	0.000E+00
cg00849267	0.095	0.022-0.400	1.000E-03
cg00910015	0.077	0.017-0.351	1.000E-03
cg00996764	21.354	3.545-128.633	1.000E-03
cg01105356	0.049	0.010-0.249	0.000E+00
cg01178099	0.050	0.010-0.251	0.000E+00
cg01308827	0.089	0.021-0.386	1.000E-03
cg01427815	0.034	0.005-0.224	0.000E+00
cg01435109	0.022	0.002-0.228	1.000E-03
cg01611777	0.079	0.017-0.378	1.000E-03
cg01821058	0.062	0.012-0.337	1.000E-03
cg02415779	0.088	0.021-0.369	1.000E-03
cg02506908	0.028	0.004-0.212	1.000E-03
cg02930996	0.098	0.024-0.405	1.000E-03
cg03241461	0.028	0.004-0.214	1.000E-03
cg03462322	0.038	0.005-0.276	1.000E-03
cg03527802	51.483	5.410-489.903	1.000E-03
cg03562531	0.016	0.002-0.149	0.000E+00
cg03967448	0.029	0.003-0.250	1.000E-03
cg04045544	0.039	0.008-0.185	0.000E+00
cg04507915	0.024	0.003-0.180	0.000E+00
cg04812351	0.081	0.019-0.341	1.000E-03
cg04858155	0.029	0.004-0.240	1.000E-03
cg05084668	0.085	0.023-0.313	0.000E+00
cg05264870	0.057	0.012-0.275	0.000E+00
cg05500840	0.055	0.009-0.326	1.000E-03
cg05744184	0.032	0.004-0.234	1.000E-03
cg05797623	0.092	0.023-0.376	1.000E-03
cg05942128	0.058	0.011-0.304	1.000E-03
cg06025774	0.022	0.003-0.181	0.000E+00
cg06056169	81.661	8.363-797.358	0.000E+00

Table S2 (continued)

Table S2 (continued)

CpG site	Hazard ratio	95% Confidence Interval	P-value
cg06394621	0.056	0.011-0.292	1.000E-03
cg06611426	0.018	0.002-0.160	0.000E+00
cg06659791	0.062	0.011-0.340	1.000E-03
cg06788267	0.091	0.023-0.360	1.000E-03
cg06824181	0.024	0.003-0.181	0.000E+00
cg06829681	0.018	0.002-0.180	1.000E-03
cg07125112	0.050	0.009-0.270	0.000E+00
cg07168526	0.020	0.004-0.114	0.000E+00
cg07242540	0.037	0.008-0.177	0.000E+00
cg07586026	0.041	0.006-0.268	1.000E-03
cg07617759	0.043	0.009-0.211	0.000E+00
cg07745373	0.039	0.008-0.195	0.000E+00
cg07935902	0.071	0.014-0.360	1.000E-03
cg08220966	0.009	0.001-0.158	1.000E-03
cg08244301	0.071	0.017-0.289	0.000E+00
cg08435131	0.059	0.011-0.324	1.000E-03
cg09220326	0.035	0.005-0.228	0.000E+00
cg09276363	29.919	4.192-213.553	1.000E-03
cg09287650	0.061	0.011-0.340	1.000E-03
cg09368485	0.061	0.011-0.342	1.000E-03
cg09371112	0.018	0.002-0.129	0.000E+00
cg09499849	0.088	0.021-0.373	1.000E-03
cg10437931	0.037	0.008-0.181	0.000E+00
cg10770076	0.040	0.006-0.256	1.000E-03
cg11229185	0.051	0.010-0.264	0.000E+00
cg11637968	0.049	0.010-0.232	0.000E+00
cg11677683	0.030	0.003-0.259	1.000E-03
cg11895835	0.066	0.014-0.309	1.000E-03
cg12134633	0.066	0.014-0.318	1.000E-03
cg12317456	0.069	0.014-0.352	1.000E-03
cg13033858	0.023	0.003-0.165	0.000E+00
cg13663116	0.082	0.018-0.37	1.000E-03
cg14189141	0.044	0.006-0.295	1.000E-03
cg14361895	0.042	0.007-0.262	1.000E-03
cg14565781	0.049	0.009-0.279	1.000E-03

Table S2 (continued)

Table S2 (continued)

CpG site	Hazard ratio	95% Confidence Interval	P-value
cg14663177	0.081	0.020-0.332	0.000E+00
cg14873022	0.064	0.016-0.260	0.000E+00
cg15243578	0.033	0.005-0.231	1.000E-03
cg15269394	0.049	0.011-0.207	0.000E+00
cg16174681	0.023	0.003-0.150	0.000E+00
cg16310003	0.019	0.003-0.142	0.000E+00
cg16319860	0.013	0.002-0.089	0.000E+00
cg17080882	0.040	0.006-0.28	1.000E-03
cg17280106	0.072	0.019-0.277	0.000E+00
cg17344321	0.083	0.021-0.322	0.000E+00
cg17492795	0.031	0.005-0.184	0.000E+00
cg17936572	0.068	0.016-0.289	0.000E+00
cg18207011	0.009	0.001-0.077	0.000E+00
cg18433784	0.062	0.012-0.328	1.000E-03
cg18437209	0.100	0.027-0.365	0.000E+00
cg18449120	0.053	0.012-0.238	0.000E+00
cg18733548	0.088	0.022-0.346	0.000E+00
cg19100988	0.070	0.015-0.328	1.000E-03
cg19126300	0.049	0.008-0.294	1.000E-03
cg19167230	0.043	0.007-0.282	1.000E-03
cg19244380	0.033	0.004-0.259	1.000E-03
cg19437285	0.024	0.003-0.177	0.000E+00
cg19445684	0.042	0.007-0.264	1.000E-03
cg19614321	0.065	0.014-0.309	1.000E-03
cg19755069	0.009	0.001-0.099	0.000E+00
cg19778015	0.035	0.005-0.268	1.000E-03
cg19876092	0.054	0.009-0.321	1.000E-03
cg19926144	0.064	0.016-0.258	0.000E+00
cg20321801	0.025	0.003-0.230	1.000E-03
cg20505457	0.027	0.003-0.208	1.000E-03
cg20782117	0.043	0.007-0.266	1.000E-03
cg21442998	0.016	0.002-0.143	0.000E+00
cg21926619	0.064	0.012-0.345	1.000E-03
cg21944234	0.020	0.002-0.202	1.000E-03

Table S2 (continued)

Table S2 (continued)

CpG site	Hazard ratio	95% Confidence Interval	P-value
cg22081371	0.181	0.063-0.518	1.000E-03
cg22108374	0.059	0.012-0.300	1.000E-03
cg22241045	0.081	0.017-0.379	1.000E-03
cg22728904	0.121	0.033-0.441	1.000E-03
cg22775000	0.082	0.018-0.379	1.000E-03
cg23236370	0.071	0.016-0.307	0.000E+00
cg23824801	0.085	0.02-0.354	1.000E-03
cg23972735	0.061	0.012-0.304	1.000E-03
cg24486958	0.049	0.008-0.316	1.000E-03
cg24651977	0.110	0.029-0.420	1.000E-03
cg25004441	0.079	0.017-0.368	1.000E-03
cg25107522	0.066	0.014-0.311	1.000E-03
cg25117600	0.040	0.008-0.207	0.000E+00
cg25150953	0.083	0.021-0.332	0.000E+00
cg25181170	0.124	0.035-0.439	1.000E-03
cg25224048	0.036	0.006-0.229	0.000E+00
cg25590826	0.061	0.012-0.321	1.000E-03
cg25872855	0.036	0.005-0.279	1.000E-03
cg26028440	0.074	0.015-0.359	1.000E-03
cg26064794	0.044	0.007-0.286	1.000E-03
cg26359133	0.025	0.003-0.225	1.000E-03
cg27106909	23.154	4.552-117.775	0.000E+00
cg27569829	15.939	3.011-84.377	1.000E-03

**Table S3** Annotation for 11 CpG sites selected by LASSO algorithm

CpG site	Chromosome	Position	Gene Name	Strand	UCSC RefGene Group	Relation to UCSC CpG Island
cg14565781	chr1	45274513	BTBD19	+	1stExon	S_Shelf
cg00910015	chr2	3826621		+		OpenSea
cg25224048	chr5	38467248		-		OpenSea
cg14189141	chr9	1042605		-		Island
cg06611426	chr12	52404161	GRASP	-	Body	S_Shelf
cg01105356	chr16	11016097	CIITA	-	Body	OpenSea
cg03527802	chr16	29819931	MAZ	-	Body	S_Shore
cg05084668	chr3	125655381	ALG1L	+	5'UTR	OpenSea
cg23824801	chr12	54653403	CBX5	+	TSS200;5'UTR	OpenSea
cg27106909	chr16	30106897	YPEL3	+	1stExon;5'UTR	N_Shore
cg19614321	chr20	4804581	RASSF2	+	TSS1500	S_Shore

LASSO, Lasso Least Absolute Shrinkage and Selector Operation.

**Table S4** Clinical features of early-onset breast cancer patients

SampleID	Overall survival	Time	Age group	Tumor size	Nodal status	Hormone receptor status	Set
GSM1858431	0	100.8	>35 & < 50	>2 cm	Positive	Positive	GSE72245
GSM1858433	0	86.52	≤35	≤2 cm	Negative	Negative	GSE72245
GSM1858435	0	105.48	>35 & < 50	≤2 cm	Negative	Positive	GSE72245
GSM1858436	0	108.24	≤35	>2 cm	Positive	Negative	GSE72245
GSM1858439	0	105.84	>35 & < 50	>2 cm	Positive	Positive	GSE72245
GSM1858442	0	107.76	>35 & < 50	≤2 cm	Negative	Positive	GSE72245
GSM1858452	0	96.36	>35 & < 50	≤2 cm	Negative	Positive	GSE72245
GSM1858453	0	91.56	>35 & < 50	>2 cm	Negative	Positive	GSE72245
GSM1858455	1	59.88	>35 & < 50	>2 cm	Negative	Negative	GSE72245
GSM1858461	0	88.44	>35 & < 50	≤2 cm	Negative	Negative	GSE72245
GSM1858463	1	18	>35 & < 50	>2 cm	Positive	Positive	GSE72245
GSM1858469	0	91.56	>35 & < 50	>2 cm	Positive	Negative	GSE72245
GSM1858473	0	87.84	>35 & < 50	>2 cm	Negative	Positive	GSE72245
GSM1858475	0	86.76	>35 & < 50	>2 cm	Positive	Positive	GSE72245
GSM1858480	1	59.76	≤35	>2 cm	Negative	Negative	GSE72245
GSM1858481	0	74.4	>35 & < 50	>2 cm	Positive	Negative	GSE72245
GSM1858482	0	74.52	>35 & < 50	≤2 cm	Negative	Negative	GSE72245
GSM1858484	0	78.96	≤35	≤2 cm	Negative	Positive	GSE72245
GSM1858485	0	81.96	>35 & < 50	≤2 cm	Positive	Positive	GSE72245
GSM1858487	1	77.4	≤35	>2 cm	Negative	Positive	GSE72245
GSM1858489	0	73.08	>35 & < 50	≤2 cm	Negative	Positive	GSE72245
GSM1858491	1	23.64	>35 & < 50	>2 cm	Positive	Positive	GSE72245
GSM1858492	0	168.96	≤35	≤2 cm	Positive	Negative	GSE72245
GSM1858495	0	153.6	>35 & < 50	>2 cm	Negative	Positive	GSE72245
GSM1858496	0	71.4	>35 & < 50	≤2 cm	Negative	Positive	GSE72245
GSM1858500	0	73.44	>35 & < 50	>2 cm	Positive	Positive	GSE72245
GSM1858503	0	65.16	>35 & < 50	>2 cm	Positive	Negative	GSE72245
GSM1858507	0	84.96	>35 & < 50	≤2 cm	Negative	Negative	GSE72245
GSM1858509	0	160.68	>35 & < 50	>2 cm	Negative	Negative	GSE72245
GSM1858512	0	153.96	>35 & < 50	≤2 cm	Positive	Positive	GSE72245
GSM1858514	0	159.96	>35 & < 50	≤2 cm	Positive	Positive	GSE72245
GSM1858517	1	135.84	>35 & < 50	>2 cm	Positive	Negative	GSE72245
GSM1858519	0	76.56	>35 & < 50	≤2 cm	Negative	Positive	GSE72245
GSM1858524	0	159.24	>35 & < 50	>2 cm	Positive	Negative	GSE72245

Table S4 (continued)

Table S4 (continued)

SampleID	Overall survival	Time	Age group	Tumor size	Nodal status	Hormone receptor status	Set
GSM1858526	0	104.88	>35 & < 50	≤2 cm	Positive	Negative	GSE72245
GSM1858531	0	62.28	>35 & < 50	>2 cm	Positive	Positive	GSE72245
GSM1858532	0	129.84	>35 & < 50	>2 cm	Negative	Negative	GSE72245
GSM1858536	1	39.12	>35 & < 50	>2 cm	Positive	Negative	GSE72245
GSM1858674	0	49.56	>35 & < 50	≤2 cm	Negative	Positive	GSE72251
GSM1858677	0	60.12	>35 & < 50	≤2 cm	Positive	Positive	GSE72251
GSM1858679	0	57.36	>35 & < 50	≤2 cm	Negative	Positive	GSE72251
GSM1858680	0	61.44	>35 & < 50	≤2 cm	Negative	Positive	GSE72251
GSM1858682	0	57.84	>35 & < 50	≤2 cm	Negative	Positive	GSE72251
GSM1858683	0	60.72	>35 & < 50	≤2 cm	Negative	Positive	GSE72251
GSM1858693	0	76.92	>35 & < 50	≤2 cm	Positive	Positive	GSE72251
GSM1858697	0	87.96	>35 & < 50	≤2 cm	Negative	Positive	GSE72251
GSM1858699	0	28.8	>35 & < 50	≤2 cm	Negative	Positive	GSE72251
GSM1858701	0	152.76	≤35	≤2 cm	Positive	Positive	GSE72251
GSM1858703	0	35.52	≤35	≤2 cm	Negative	Positive	GSE72251
GSM1858704	0	15.36	>35 & < 50	≤2 cm	Negative	Positive	GSE72251
GSM1858712	0	69.96	>35 & < 50	≤2 cm	Positive	Positive	GSE72251
GSM1858714	0	67.56	≤35	≤2 cm	Negative	Positive	GSE72251
GSM1858724	0	33.84	≤35	>2 cm	Positive	Positive	GSE72251
GSM1858728	0	90.6	>35 & < 50	≤2 cm	Negative	Positive	GSE72251
GSM1858733	0	54.96	≤35	>2 cm	Positive	Negative	GSE72251
GSM1858736	0	56.28	>35 & < 50	>2 cm	Negative	Negative	GSE72251
GSM1858737	1	49.44	>35 & < 50	>2 cm	Positive	Negative	GSE72251
GSM1858740	0	35.88	>35 & < 50	>2 cm	Positive	Negative	GSE72251
GSM1858741	0	26.16	>35 & < 50	≤2 cm	Positive	Positive	GSE72251
GSM1858744	0	34.08	>35 & < 50	≤2 cm	Positive	Positive	GSE72251
GSM1858745	1	52.56	≤35	>2 cm	Positive	Negative	GSE72251
GSM1858751	0	49.44	>35 & < 50	≤2 cm	Negative	Negative	GSE72251
GSM1858754	0	243	>35 & < 50	>2 cm	Positive	Positive	GSE72251
GSM1858759	0	60	≤35	>2 cm	Negative	Negative	GSE72251
GSM1858762	1	28.08	≤35	>2 cm	Positive	Negative	GSE72251
GSM1858766	0	86.64	>35 & < 50	≤2 cm	Positive	Negative	GSE72251
GSM1858768	0	20.4	>35 & < 50	≤2 cm	Negative	Negative	GSE72251
GSM1858778	0	53.28	>35 & < 50	≤2 cm	Negative	Negative	GSE72251

Table S4 (continued)

Table S4 (continued)

SampleID	Overall survival	Time	Age group	Tumor size	Nodal status	Hormone receptor status	Set
GSM1858780	0	23.52	>35 & < 50	>2 cm	Positive	Negative	GSE72251
GSM1858781	0	51.84	>35 & < 50	≤2 cm	Positive	Positive	GSE72251
GSM1858783	1	36.12	≤35	≤2 cm	Positive	Negative	GSE72251
GSM1858787	0	38.16	≤35	≤2 cm	Negative	Negative	GSE72251
GSM1858788	0	42.36	>35 & < 50	>2 cm	Negative	Negative	GSE72251
GSM1858789	0	24.84	>35 & < 50	>2 cm	Positive	Negative	GSE72251
GSM1858791	0	26.16	>35 & < 50	>2 cm	Negative	Negative	GSE72251
TCGA-3C-AALI-01	0	133.5	>35 & < 50	>2 cm	Positive	Positive	TCGA
TCGA-4H-AAAK-01	0	11.6	>35 & < 50	>2 cm	Positive	Positive	TCGA
TCGA-5L-AAT0-01	0	49.23	>35 & < 50	>2 cm	Negative	Positive	TCGA
TCGA-A1-A0SH-01	0	47.9	>35 & < 50	>2 cm	Negative	Positive	TCGA
TCGA-A1-A0SJ-01	0	13.87	>35 & < 50	>2 cm	Positive	Positive	TCGA
TCGA-A1-A0SN-01	0	39.87	>35 & < 50	≤2 cm	Positive	Positive	TCGA
TCGA-A1-A0SP-01	0	19.47	>35 & < 50	>2 cm	Negative	Negative	TCGA
TCGA-A1-A0SQ-01	0	18.47	>35 & < 50	>2 cm	Positive	Positive	TCGA
TCGA-A2-A04R-01	0	123.63	>35 & < 50	≤2 cm	Negative	Positive	TCGA
TCGA-A2-A0SX-01	0	51.13	>35 & < 50	≤2 cm	Negative	Negative	TCGA
TCGA-A2-A0T5-01	0	17.7	>35 & < 50	>2 cm	Negative	Positive	TCGA
TCGA-A2-A0T6-01	0	19.17	>35 & < 50	>2 cm	Negative	Positive	TCGA
TCGA-A2-A0YE-01	0	18.47	>35 & < 50	>2 cm	Positive	Negative	TCGA
TCGA-A2-A0YJ-01	0	18.87	>35 & < 50	>2 cm	Positive	Positive	TCGA
TCGA-A2-A0YL-01	0	49.13	>35 & < 50	>2 cm	Positive	Positive	TCGA
TCGA-A2-A1G0-01	0	20.53	>35 & < 50	>2 cm	Positive	Positive	TCGA
TCGA-A2-A1G6-01	0	16.7	>35 & < 50	>2 cm	Positive	Negative	TCGA
TCGA-A2-A25A-01	0	109.2	>35 & < 50	>2 cm	Negative	Positive	TCGA
TCGA-A2-A25B-01	0	43.03	>35 & < 50	>2 cm	Positive	Positive	TCGA
TCGA-A2-A25C-01	0	17.43	>35 & < 50	>2 cm	Positive	Positive	TCGA
TCGA-A2-A25E-01	0	106.8	≤35	>2 cm	Positive	Positive	TCGA
TCGA-A2-A3KD-01	0	40.2	>35 & < 50	>2 cm	Positive	Positive	TCGA
TCGA-A2-A3XT-01	0	92.33	>35 & < 50	>2 cm	Positive	Negative	TCGA
TCGA-A2-A3XU-01	1	30.4	≤35	>2 cm	Positive	Negative	TCGA
TCGA-A2-A3XV-01	0	33.2	>35 & < 50	>2 cm	Negative	Positive	TCGA
TCGA-A2-A3XW-01	0	57.07	>35 & < 50	>2 cm	Positive	Positive	TCGA
TCGA-A2-A3XX-01	1	47.97	>35 & < 50	>2 cm	Negative	Negative	TCGA

Table S4 (continued)

**Table S4** (continued)

SampleID	Overall survival	Time	Age group	Tumor size	Nodal status	Hormone receptor status	Set
TCGA-A2-A3XY-01	1	36.43	>35 & < 50	>2 cm	Positive	Negative	TCGA
TCGA-A2-A3XZ-01	0	51.07	>35 & < 50	≤2 cm	Negative	Negative	TCGA
TCGA-A2-A4RW-01	0	7.4	>35 & < 50	>2 cm	Positive	Positive	TCGA
TCGA-A2-A4RY-01	0	21.6	>35 & < 50	>2 cm	Positive	Positive	TCGA
TCGA-A7-A0D9-01	0	37.97	>35 & < 50	>2 cm	Negative	Positive	TCGA
TCGA-A7-A13D-01	0	32.17	>35 & < 50	>2 cm	Negative	Positive	TCGA
TCGA-A7-A13F-01	0	25.5	>35 & < 50	>2 cm	Positive	Positive	TCGA
TCGA-A7-A26G-01	0	24.07	>35 & < 50	>2 cm	Negative	Negative	TCGA
TCGA-A7-A26J-01	0	20.9	>35 & < 50	>2 cm	Negative	Positive	TCGA
TCGA-A7-A426-01	0	12.13	>35 & < 50	>2 cm	Positive	Positive	TCGA
TCGA-A7-A4SA-01	0	15.13	>35 & < 50	>2 cm	Positive	Positive	TCGA
TCGA-A7-A5ZW-01	0	10.87	>35 & < 50	≤2 cm	Positive	Positive	TCGA
TCGA-A7-A5ZX-01	0	11.2	>35 & < 50	>2 cm	Positive	Positive	TCGA
TCGA-A7-A6VW-01	0	9.5	>35 & < 50	>2 cm	Negative	Negative	TCGA
TCGA-A7-A6VY-01	0	8.87	>35 & < 50	>2 cm	Positive	Negative	TCGA
TCGA-A8-A075-01	0	17.27	>35 & < 50	>2 cm	Positive	Positive	TCGA
TCGA-A8-A08O-01	0	31.43	>35 & < 50	>2 cm	Positive	Positive	TCGA
TCGA-AC-A23E-01	0	23.27	>35 & < 50	>2 cm	Positive	Positive	TCGA
TCGA-AC-A2BM-01	0	100.73	>35 & < 50	>2 cm	Positive	Positive	TCGA
TCGA-AC-A2FF-01	0	91.97	>35 & < 50	>2 cm	Positive	Positive	TCGA
TCGA-AC-A2FK-01	0	88.33	>35 & < 50	>2 cm	Positive	Positive	TCGA
TCGA-AC-A3BB-01	0	32.9	>35 & < 50	>2 cm	Positive	Positive	TCGA
TCGA-AC-A3TM-01	0	25.4	>35 & < 50	>2 cm	Positive	Positive	TCGA
TCGA-AC-A6IV-01	0	18.93	>35 & < 50	>2 cm	Positive	Positive	TCGA
TCGA-AC-A6IX-01	0	12.43	>35 & < 50	>2 cm	Positive	Positive	TCGA
TCGA-AC-A6NO-01	0	1.7	>35 & < 50	>2 cm	Positive	Positive	TCGA
TCGA-AN-A0XW-01	0	5.67	>35 & < 50	>2 cm	Positive	Positive	TCGA
TCGA-AO-A03L-01	0	81.4	≤35	>2 cm	Positive	Positive	TCGA
TCGA-AO-A03M-01	0	62.2	≤35	≤2 cm	Negative	Positive	TCGA
TCGA-AO-A03U-01	1	59.77	≤35	≤2 cm	Negative	Negative	TCGA
TCGA-AO-A0JA-01	0	21.83	>35 & < 50	>2 cm	Positive	Positive	TCGA
TCGA-AO-A0JB-01	0	51.4	>35 & < 50	>2 cm	Positive	Positive	TCGA
TCGA-AO-A0JG-01	0	26.6	>35 & < 50	>2 cm	Positive	Positive	TCGA
TCGA-AO-A0JM-01	0	72.8	>35 & < 50	>2 cm	Positive	Positive	TCGA

**Table S4** (continued)

**Table S4** (continued)

SampleID	Overall survival	Time	Age group	Tumor size	Nodal status	Hormone receptor status	Set
TCGA-AO-A124-01	0	116.87	>35 & < 50	>2 cm	Negative	Negative	TCGA
TCGA-AO-A126-01	0	110.23	>35 & < 50	>2 cm	Negative	Positive	TCGA
TCGA-AO-A129-01	0	109.53	≤35	>2 cm	Positive	Negative	TCGA
TCGA-AO-A12C-01	0	79.07	>35 & < 50	>2 cm	Positive	Positive	TCGA
TCGA-AO-A1KO-01	0	20.73	>35 & < 50	>2 cm	Negative	Positive	TCGA
TCGA-AQ-A04L-01	0	131.9	>35 & < 50	>2 cm	Negative	Positive	TCGA
TCGA-AQ-A1H3-01	0	32.97	>35 & < 50	>2 cm	Positive	Positive	TCGA
TCGA-AR-A0TP-01	0	142.5	>35 & < 50	>2 cm	Negative	Positive	TCGA
TCGA-AR-A0TQ-01	0	99.7	≤35	>2 cm	Positive	Positive	TCGA
TCGA-AR-A0TU-01	0	23.63	≤35	>2 cm	Negative	Negative	TCGA
TCGA-AR-A0TW-01	0	100.3	>35 & < 50	>2 cm	Positive	Positive	TCGA
TCGA-AR-A0TZ-01	1	108.73	>35 & < 50	>2 cm	Positive	Positive	TCGA
TCGA-AR-A0U2-01	1	85.03	>35 & < 50	>2 cm	Positive	Positive	TCGA
TCGA-AR-A1AI-01	0	109.87	>35 & < 50	>2 cm	Negative	Negative	TCGA
TCGA-AR-A1AN-01	0	97.33	>35 & < 50	>2 cm	Negative	Positive	TCGA
TCGA-AR-A1AO-01	0	87.27	>35 & < 50	≤2 cm	Positive	Positive	TCGA
TCGA-AR-A1AQ-01	0	100.7	>35 & < 50	>2 cm	Negative	Negative	TCGA
TCGA-AR-A1AR-01	1	17.47	>35 & < 50	≤2 cm	Positive	Negative	TCGA
TCGA-AR-A1AU-01	0	95.6	>35 & < 50	>2 cm	Positive	Positive	TCGA
TCGA-AR-A24K-01	0	51.6	>35 & < 50	>2 cm	Negative	Positive	TCGA
TCGA-AR-A24L-01	1	95.53	≤35	>2 cm	Positive	Positive	TCGA
TCGA-AR-A24M-01	0	122	>35 & < 50	>2 cm	Positive	Positive	TCGA
TCGA-AR-A24O-01	0	120.23	>35 & < 50	>2 cm	Positive	Positive	TCGA
TCGA-AR-A24P-01	0	2.8	>35 & < 50	≤2 cm	Negative	Positive	TCGA
TCGA-AR-A24Q-01	0	105.73	>35 & < 50	>2 cm	Negative	Positive	TCGA
TCGA-AR-A24R-01	0	114.33	>35 & < 50	≤2 cm	Positive	Positive	TCGA
TCGA-AR-A24T-01	0	106.73	>35 & < 50	>2 cm	Positive	Positive	TCGA
TCGA-AR-A24U-01	0	104.27	>35 & < 50	≤2 cm	Positive	Negative	TCGA
TCGA-AR-A252-01	0	94.6	>35 & < 50	≤2 cm	Negative	Positive	TCGA
TCGA-AR-A254-01	0	86.83	>35 & < 50	>2 cm	Positive	Positive	TCGA
TCGA-AR-A256-01	1	95.13	>35 & < 50	>2 cm	Negative	Negative	TCGA
TCGA-AR-A2LJ-01	0	87.73	>35 & < 50	>2 cm	Positive	Positive	TCGA
TCGA-AR-A2LM-01	0	64.5	>35 & < 50	≤2 cm	Positive	Positive	TCGA
TCGA-AR-A2LO-01	0	39.93	>35 & < 50	>2 cm	Positive	Positive	TCGA

**Table S4** (continued)

Table S4 (continued)

SampleID	Overall survival	Time	Age group	Tumor size	Nodal status	Hormone receptor status	Set
TCGA-B6-A0RG-01	0	69.4	≤35	>2 cm	Negative	Negative	TCGA
TCGA-B6-A0RS-01	1	102.1	>35 & < 50	>2 cm	Negative	Negative	TCGA
TCGA-B6-A0RT-01	0	90.7	>35 & < 50	>2 cm	Positive	Negative	TCGA
TCGA-B6-A0RU-01	0	286.83	>35 & < 50	≤2 cm	Negative	Negative	TCGA
TCGA-B6-A0RV-01	0	171.87	>35 & < 50	>2 cm	Positive	Positive	TCGA
TCGA-B6-A0WX-01	1	21.3	>35 & < 50	>2 cm	Positive	Negative	TCGA
TCGA-B6-A0WY-01	1	115.37	>35 & < 50	>2 cm	Positive	Positive	TCGA
TCGA-B6-A0WZ-01	0	209.73	>35 & < 50	>2 cm	Positive	Positive	TCGA
TCGA-B6-A0X1-01	1	248.5	>35 & < 50	>2 cm	Positive	Negative	TCGA
TCGA-B6-A3ZX-01	1	38.4	>35 & < 50	>2 cm	Positive	Negative	TCGA
TCGA-B6-A400-01	0	7.17	>35 & < 50	>2 cm	Positive	Negative	TCGA
TCGA-B6-A401-01	0	86.53	>35 & < 50	≤2 cm	Positive	Positive	TCGA
TCGA-B6-A402-01	0	76.03	>35 & < 50	≤2 cm	Negative	Negative	TCGA
TCGA-B6-A409-01	1	19.1	>35 & < 50	≤2 cm	Positive	Negative	TCGA
TCGA-BH-A0AU-01	0	63.8	>35 & < 50	>2 cm	Negative	Positive	TCGA
TCGA-BH-A0AZ-01	0	63.97	>35 & < 50	>2 cm	Positive	Positive	TCGA
TCGA-BH-A0B5-01	0	71.2	>35 & < 50	>2 cm	Positive	Positive	TCGA
TCGA-BH-A0B9-01	0	52.4	>35 & < 50	≤2 cm	Negative	Negative	TCGA
TCGA-BH-A0BJ-01	0	22	>35 & < 50	>2 cm	Positive	Positive	TCGA
TCGA-BH-A0C3-01	0	90.3	>35 & < 50	≤2 cm	Negative	Positive	TCGA
TCGA-BH-A0DG-01	0	68.03	≤35	>2 cm	Negative	Positive	TCGA
TCGA-BH-A0DK-01	0	14.1	>35 & < 50	>2 cm	Negative	Positive	TCGA
TCGA-BH-A0DQ-01	0	3.27	>35 & < 50	>2 cm	Positive	Positive	TCGA
TCGA-BH-A0E0-01	0	4.47	>35 & < 50	>2 cm	Positive	Negative	TCGA
TCGA-BH-A0E2-01	0	14.5	>35 & < 50	>2 cm	Positive	Positive	TCGA
TCGA-BH-A0H3-01	0	64.27	>35 & < 50	≤2 cm	Negative	Positive	TCGA
TCGA-BH-A0HA-01	0	53.7	≤35	≤2 cm	Negative	Positive	TCGA
TCGA-BH-A0W4-01	0	25.3	>35 & < 50	>2 cm	Negative	Positive	TCGA
TCGA-BH-A1ES-01	1	115.4	≤35	>2 cm	Positive	Positive	TCGA
TCGA-BH-A1EV-01	1	12.17	>35 & < 50	>2 cm	Positive	Positive	TCGA
TCGA-BH-A1EW-01	1	56.47	>35 & < 50	>2 cm	Positive	Negative	TCGA
TCGA-BH-A1FE-01	1	75.77	≤35	>2 cm	Positive	Positive	TCGA
TCGA-BH-A1FH-01	1	34.47	>35 & < 50	>2 cm	Positive	Positive	TCGA
TCGA-BH-A1FM-01	1	46.27	>35 & < 50	>2 cm	Positive	Positive	TCGA

Table S4 (continued)

**Table S4** (continued)

SampleID	Overall survival	Time	Age group	Tumor size	Nodal status	Hormone receptor status	Set
TCGA-BH-A1FN-01	1	73.07	≤35	>2 cm	Negative	Positive	TCGA
TCGA-BH-A1FU-01	1	56.27	>35 & < 50	≤2 cm	Negative	Negative	TCGA
TCGA-BH-A28O-01	0	37.33	>35 & < 50	>2 cm	Positive	Positive	TCGA
TCGA-BH-A28Q-01	0	37.3	>35 & < 50	>2 cm	Positive	Positive	TCGA
TCGA-BH-A2L8-01	0	20.4	>35 & < 50	>2 cm	Negative	Positive	TCGA
TCGA-BH-A42V-01	0	21.17	>35 & < 50	≤2 cm	Positive	Positive	TCGA
TCGA-BH-A6R8-01	0	9.77	>35 & < 50	>2 cm	Negative	Positive	TCGA
TCGA-C8-A1HF-01	0	11.07	>35 & < 50	>2 cm	Negative	Positive	TCGA
TCGA-C8-A1HG-01	0	11.5	>35 & < 50	>2 cm	Negative	Positive	TCGA
TCGA-C8-A1HL-01	0	10.57	>35 & < 50	>2 cm	Positive	Positive	TCGA
TCGA-C8-A26V-01	0	20.53	>35 & < 50	>2 cm	Positive	Positive	TCGA
TCGA-C8-A273-01	0	17.1	≤35	>2 cm	Positive	Positive	TCGA
TCGA-C8-A27A-01	0	24.9	>35 & < 50	>2 cm	Positive	Positive	TCGA
TCGA-C8-A27B-01	0	14.63	>35 & < 50	>2 cm	Negative	Negative	TCGA
TCGA-D8-A1J9-01	0	17.73	>35 & < 50	≤2 cm	Negative	Positive	TCGA
TCGA-D8-A1JD-01	0	18.4	>35 & < 50	>2 cm	Positive	Positive	TCGA
TCGA-D8-A1X7-01	0	16.97	>35 & < 50	>2 cm	Negative	Positive	TCGA
TCGA-D8-A1XD-01	0	17.4	>35 & < 50	≤2 cm	Positive	Positive	TCGA
TCGA-D8-A1XF-01	0	15.43	>35 & < 50	>2 cm	Negative	Positive	TCGA
TCGA-D8-A1XL-01	0	20.2	≤35	>2 cm	Positive	Positive	TCGA
TCGA-D8-A1XS-01	0	16.53	>35 & < 50	>2 cm	Positive	Positive	TCGA
TCGA-D8-A27F-01	0	16.27	>35 & < 50	>2 cm	Negative	Negative	TCGA
TCGA-D8-A27K-01	0	48.7	>35 & < 50	>2 cm	Positive	Positive	TCGA
TCGA-D8-A27L-01	0	16.63	>35 & < 50	≤2 cm	Positive	Positive	TCGA
TCGA-D8-A27N-01	0	17.3	>35 & < 50	>2 cm	Positive	Positive	TCGA
TCGA-D8-A27R-01	0	10.23	>35 & < 50	>2 cm	Positive	Positive	TCGA
TCGA-E2-A106-01	0	84.7	≤35	≤2 cm	Positive	Positive	TCGA
TCGA-E2-A10F-01	0	29.27	>35 & < 50	>2 cm	Negative	Positive	TCGA
TCGA-E2-A14N-01	0	47.8	>35 & < 50	>2 cm	Positive	Negative	TCGA
TCGA-E2-A15I-01	0	56.4	>35 & < 50	>2 cm	Negative	Positive	TCGA
TCGA-E2-A1B0-01	0	54.37	>35 & < 50	>2 cm	Positive	Negative	TCGA
TCGA-E2-A1B1-01	0	88.43	>35 & < 50	>2 cm	Positive	Positive	TCGA
TCGA-E2-A1B5-01	0	32.8	>35 & < 50	>2 cm	Negative	Positive	TCGA
TCGA-E2-A1B6-01	0	28.9	>35 & < 50	>2 cm	Negative	Negative	TCGA

**Table S4** (continued)

**Table S4** (continued)

SampleID	Overall survival	Time	Age group	Tumor size	Nodal status	Hormone receptor status	Set
TCGA-E2-A1IG-01	0	71.33	>35 & < 50	>2 cm	Positive	Positive	TCGA
TCGA-E2-A1IO-01	0	61.83	>35 & < 50	≤2 cm	Negative	Positive	TCGA
TCGA-E2-A1L6-01	0	54.93	>35 & < 50	≤2 cm	Positive	Positive	TCGA
TCGA-E2-A1L7-01	0	61.2	>35 & < 50	>2 cm	Positive	Negative	TCGA
TCGA-E2-A1L9-01	0	19.93	>35 & < 50	≤2 cm	Positive	Positive	TCGA
TCGA-E2-A1LB-01	0	76.87	>35 & < 50	>2 cm	Positive	Negative	TCGA
TCGA-E2-A1LG-01	0	50.77	>35 & < 50	>2 cm	Negative	Negative	TCGA
TCGA-E2-A1LS-01	0	53.47	>35 & < 50	≤2 cm	Negative	Negative	TCGA
TCGA-E2-A3DX-01	0	44.17	>35 & < 50	>2 cm	Positive	Positive	TCGA
TCGA-E2-A570-01	0	31.03	>35 & < 50	≤2 cm	Positive	Positive	TCGA
TCGA-E2-A573-01	0	35.4	>35 & < 50	≤2 cm	Negative	Negative	TCGA
TCGA-E2-A574-01	0	39.3	>35 & < 50	>2 cm	Negative	Negative	TCGA
TCGA-E9-A1N4-01	0	33.33	>35 & < 50	>2 cm	Positive	Positive	TCGA
TCGA-E9-A1N5-01	0	37.33	>35 & < 50	>2 cm	Positive	Positive	TCGA
TCGA-E9-A1NE-01	0	36.27	≤35	>2 cm	Positive	Positive	TCGA
TCGA-E9-A227-01	0	32.5	>35 & < 50	>2 cm	Positive	Positive	TCGA
TCGA-E9-A22D-01	0	41.6	>35 & < 50	>2 cm	Negative	Positive	TCGA
TCGA-E9-A22G-01	0	41.3	>35 & < 50	>2 cm	Negative	Negative	TCGA
TCGA-E9-A22H-01	0	41.07	>35 & < 50	>2 cm	Positive	Positive	TCGA
TCGA-E9-A3X8-01	0	30.87	>35 & < 50	>2 cm	Positive	Positive	TCGA
TCGA-E9-A6HE-01	0	28.23	>35 & < 50	>2 cm	Positive	Positive	TCGA
TCGA-EW-A1IX-01	0	40.27	>35 & < 50	≤2 cm	Positive	Positive	TCGA
TCGA-EW-A1IY-01	0	8.6	>35 & < 50	≤2 cm	Negative	Positive	TCGA
TCGA-EW-A1J1-01	0	19.17	>35 & < 50	>2 cm	Positive	Positive	TCGA
TCGA-EW-A1J2-01	0	13.43	>35 & < 50	≤2 cm	Positive	Positive	TCGA
TCGA-EW-A1OX-01	0	30.37	>35 & < 50	>2 cm	Negative	Positive	TCGA
TCGA-EW-A1P3-01	0	53.7	>35 & < 50	>2 cm	Negative	Positive	TCGA
TCGA-EW-A1P4-01	0	30.23	>35 & < 50	>2 cm	Negative	Negative	TCGA
TCGA-EW-A1PF-01	0	14.63	>35 & < 50	≤2 cm	Negative	Positive	TCGA
TCGA-EW-A2FS-01	0	53.47	>35 & < 50	>2 cm	Positive	Positive	TCGA
TCGA-EW-A2FV-01	0	26.27	>35 & < 50	>2 cm	Positive	Positive	TCGA
TCGA-EW-A6S9-01	0	15.43	≤35	≤2 cm	Positive	Positive	TCGA
TCGA-EW-A6SD-01	0	33.67	≤35	>2 cm	Positive	Negative	TCGA
TCGA-GM-A2DA-01	1	219.77	>35 & < 50	>2 cm	Positive	Positive	TCGA

**Table S4** (continued)

Table S4 (continued)

SampleID	Overall survival	Time	Age group	Tumor size	Nodal status	Hormone receptor status	Set
TCGA-GM-A2DL-01	0	117.3	>35 & < 50	≤2 cm	Negative	Positive	TCGA
TCGA-GM-A3XG-01	0	44.33	>35 & < 50	>2 cm	Positive	Positive	TCGA
TCGA-GM-A3XL-01	0	70.27	>35 & < 50	>2 cm	Negative	Negative	TCGA
TCGA-GM-A3XN-01	0	67.3	>35 & < 50	≤2 cm	Positive	Positive	TCGA
TCGA-HN-A2OB-01	1	63.33	>35 & < 50	>2 cm	Positive	Positive	TCGA
TCGA-JL-A3YW-01	0	12	>35 & < 50	>2 cm	Positive	Positive	TCGA
TCGA-JL-A3YX-01	0	11.73	>35 & < 50	>2 cm	Negative	Positive	TCGA
TCGA-LD-A66U-01	0	21.53	>35 & < 50	>2 cm	Positive	Positive	TCGA
TCGA-LL-A5YN-01	0	14.9	>35 & < 50	>2 cm	Negative	Positive	TCGA
TCGA-LL-A5YO-01	0	14.67	>35 & < 50	≤2 cm	Negative	Negative	TCGA
TCGA-LL-A5YP-01	0	15	>35 & < 50	>2 cm	Positive	Positive	TCGA
TCGA-LL-A6FR-01	0	16.3	>35 & < 50	>2 cm	Negative	Positive	TCGA
TCGA-LL-A7SZ-01	0	19.8	>35 & < 50	>2 cm	Positive	Positive	TCGA
TCGA-MS-A51U-01	0	22.7	>35 & < 50	>2 cm	Positive	Positive	TCGA
TCGA-OL-A5D8-01	0	32.43	>35 & < 50	>2 cm	Negative	Positive	TCGA
TCGA-OL-A5RV-01	0	35.4	>35 & < 50	>2 cm	Positive	Positive	TCGA
TCGA-OL-A5RW-01	0	36.87	>35 & < 50	≤2 cm	Positive	Negative	TCGA
TCGA-OL-A66I-01	0	23.8	>35 & < 50	≤2 cm	Positive	Negative	TCGA
TCGA-OL-A66O-01	0	17.6	>35 & < 50	>2 cm	Positive	Positive	TCGA
TCGA-OL-A6VO-01	0	28.6	>35 & < 50	≤2 cm	Negative	Negative	TCGA
TCGA-OL-A6VQ-01	0	20	>35 & < 50	>2 cm	Negative	Positive	TCGA
TCGA-OL-A6VR-01	0	40.67	>35 & < 50	≤2 cm	Negative	Positive	TCGA
TCGA-PE-A5DE-01	0	88.17	>35 & < 50	>2 cm	Negative	Positive	TCGA
TCGA-S3-A6ZH-01	0	21.37	≤35	>2 cm	Positive	Positive	TCGA
TCGA-S3-AA14-01	0	17.63	>35 & < 50	≤2 cm	Negative	Positive	TCGA
TCGA-XX-A899-01	0	15.57	>35 & < 50	≤2 cm	Positive	Positive	TCGA
TCGA-Z7-A8R6-01	0	108.53	>35 & < 50	≤2 cm	Negative	Positive	TCGA
GSM1941862	0	266.55	>35 & < 50	>2 cm	Negative	Negative	GSE75067
GSM1941864	0	249.99	>35 & < 50	>2 cm	Negative	Negative	GSE75067
GSM1941865	1	60.52	>35 & < 50	≤2 cm	Negative	Positive	GSE75067
GSM1941867	0	292.07	>35 & < 50	>2 cm	Positive	Positive	GSE75067
GSM1941870	0	263.16	>35 & < 50	≤2 cm	Negative	Positive	GSE75067
GSM1941871	1	21.53	≤35	>2 cm	Positive	Positive	GSE75067
GSM1941872	0	237.08	>35 & < 50	>2 cm	Negative	Negative	GSE75067

Table S4 (continued)

Table S4 (continued)

SampleID	Overall survival	Time	Age group	Tumor size	Nodal status	Hormone receptor status	Set
GSM1941873	1	38.47	≤35	>2 cm	Positive	Negative	GSE75067
GSM1941875	1	13.34	>35 & < 50	>2 cm	Positive	Negative	GSE75067
GSM1941878	0	279.2	>35 & < 50	>2 cm	Positive	Negative	GSE75067
GSM1941879	0	272.59	>35 & < 50	>2 cm	Negative	Positive	GSE75067
GSM1941881	0	276.24	>35 & < 50	≤2 cm	Negative	Negative	GSE75067
GSM1941885	1	16.8	>35 & < 50	>2 cm	Positive	Negative	GSE75067
GSM1941892	1	57.99	≤35	>2 cm	Positive	Positive	GSE75067
GSM1941893	1	29.26	≤35	>2 cm	Positive	Negative	GSE75067
GSM1941896	0	248.12	>35 & < 50	>2 cm	Negative	Positive	GSE75067
GSM1941898	1	125.93	≤35	>2 cm	Positive	Negative	GSE75067
GSM1941900	0	230.05	>35 & < 50	>2 cm	Negative	Negative	GSE75067
GSM1941901	1	88.48	>35 & < 50	>2 cm	Positive	Positive	GSE75067
GSM1941903	0	194.4	>35 & < 50	≤2 cm	Positive	Positive	GSE75067
GSM1941906	0	333.73	≤35	>2 cm	Negative	Positive	GSE75067
GSM1941907	0	312.15	>35 & < 50	>2 cm	Negative	Negative	GSE75067
GSM1941913	1	50.43	≤35	>2 cm	Positive	Positive	GSE75067
GSM1941914	1	67.02	≤35	≤2 cm	Negative	Positive	GSE75067
GSM1941916	1	32.69	>35 & < 50	≤2 cm	Positive	Negative	GSE75067
GSM1941918	1	68.4	>35 & < 50	>2 cm	Positive	Positive	GSE75067
GSM1941919	1	161.87	≤35	≤2 cm	Positive	Positive	GSE75067
GSM1941921	1	7.06	>35 & < 50	>2 cm	Positive	Negative	GSE75067
GSM1941923	0	269.96	>35 & < 50	≤2 cm	Negative	Positive	GSE75067
GSM1941925	1	62.39	>35 & < 50	≤2 cm	Negative	Positive	GSE75067
GSM1941929	1	302.13	>35 & < 50	>2 cm	Positive	Negative	GSE75067
GSM1941932	0	237.31	>35 & < 50	>2 cm	Negative	Negative	GSE75067
GSM1941933	1	36.04	>35 & < 50	>2 cm	Positive	Positive	GSE75067
GSM1941936	0	244.01	>35 & < 50	≤2 cm	Negative	Positive	GSE75067
GSM1941937	1	15.97	>35 & < 50	>2 cm	Negative	Negative	GSE75067
GSM1941938	0	232.05	>35 & < 50	>2 cm	Negative	Positive	GSE75067
GSM1941939	1	31.34	>35 & < 50	>2 cm	Positive	Negative	GSE75067
GSM1941940	1	26.35	>35 & < 50	>2 cm	Positive	Positive	GSE75067
GSM1941944	0	294.21	>35 & < 50	>2 cm	Negative	Positive	GSE75067
GSM1941945	0	249.36	>35 & < 50	>2 cm	Negative	Negative	GSE75067
GSM1941947	0	310.7	>35 & < 50	>2 cm	Negative	Negative	GSE75067

Table S4 (continued)

Table S4 (continued)

SampleID	Overall survival	Time	Age group	Tumor size	Nodal status	Hormone receptor status	Set
GSM1941948	0	323.35	>35 & < 50	>2 cm	Positive	Positive	GSE75067
GSM1941949	0	164.67	>35 & < 50	>2 cm	Positive	Positive	GSE75067
GSM1941952	0	319.97	>35 & < 50	≤2 cm	Negative	Positive	GSE75067
GSM1941955	0	290.69	>35 & < 50	>2 cm	Negative	Positive	GSE75067
GSM1941956	0	272.82	>35 & < 50	≤2 cm	Negative	Negative	GSE75067
GSM1941960	1	26.45	>35 & < 50	>2 cm	Positive	Negative	GSE75067
GSM1941961	0	251.89	>35 & < 50	>2 cm	Negative	Positive	GSE75067
GSM1941966	1	55.66	≤35	>2 cm	Positive	Positive	GSE75067
GSM1941967	0	209.05	>35 & < 50	>2 cm	Negative	Negative	GSE75067
GSM1941968	1	23.72	>35 & < 50	>2 cm	Negative	Negative	GSE75067
GSM1941970	0	272.59	>35 & < 50	≤2 cm	Negative	Positive	GSE75067
GSM1941971	0	248.9	>35 & < 50	≤2 cm	Negative	Negative	GSE75067
GSM1941972	1	13.84	>35 & < 50	>2 cm	Positive	Positive	GSE75067
GSM1941978	0	274.83	>35 & < 50	≤2 cm	Negative	Positive	GSE75067
GSM1941979	1	39.1	>35 & < 50	≤2 cm	Negative	Negative	GSE75067
GSM1941984	0	235.96	≤35	>2 cm	Positive	Positive	GSE75067
GSM1941989	0	142.59	>35 & < 50	≤2 cm	Positive	Positive	GSE75067
GSM1941991	0	266.55	>35 & < 50	≤2 cm	Negative	Positive	GSE75067
GSM1941992	0	234.78	>35 & < 50	≤2 cm	Negative	Negative	GSE75067
GSM1941994	0	273.64	>35 & < 50	≤2 cm	Negative	Positive	GSE75067
GSM1941998	0	159.61	≤35	>2 cm	Positive	Negative	GSE75067
GSM1942000	0	267.07	>35 & < 50	≤2 cm	Negative	Positive	GSE75067
GSM1942001	1	201.3	>35 & < 50	>2 cm	Negative	Negative	GSE75067
GSM1942002	1	19.19	>35 & < 50	>2 cm	Negative	Negative	GSE75067
GSM1942004	0	259.88	>35 & < 50	≤2 cm	Negative	Positive	GSE75067
GSM1942006	0	160.31	>35 & < 50	≤2 cm	Negative	Negative	GSE75067
GSM1942007	1	24.05	>35 & < 50	>2 cm	Positive	Negative	GSE75067
GSM1942008	0	305.18	>35 & < 50	≤2 cm	Negative	Positive	GSE75067
GSM1942011	1	89.53	>35 & < 50	>2 cm	Negative	Negative	GSE75067
GSM1942013	1	60.35	≤35	>2 cm	Positive	Positive	GSE75067
GSM1942020	0	250.97	>35 & < 50	≤2 cm	Negative	Positive	GSE75067
GSM1942021	0	294.18	>35 & < 50	>2 cm	Negative	Negative	GSE75067
GSM1942025	1	27.95	>35 & < 50	≤2 cm	Positive	Positive	GSE75067
GSM1942028	0	248.84	>35 & < 50	>2 cm	Negative	Positive	GSE75067

Table S4 (continued)

**Table S4** (continued)

SampleID	Overall survival	Time	Age group	Tumor size	Nodal status	Hormone receptor status	Set
GSM1942029	1	21.82	>35 & < 50	>2 cm	Positive	Positive	GSE75067
GSM1942030	0	167.52	>35 & < 50	≤2 cm	Positive	Positive	GSE75067
GSM1942034	1	66.66	>35 & < 50	>2 cm	Negative	Negative	GSE75067
GSM1942035	0	265	>35 & < 50	≤2 cm	Negative	Negative	GSE75067
GSM1942036	0	120.62	>35 & < 50	>2 cm	Positive	Negative	GSE75067
GSM1942037	0	273.45	>35 & < 50	≤2 cm	Negative	Positive	GSE75067
GSM1942038	0	272.36	>35 & < 50	≤2 cm	Negative	Positive	GSE75067
GSM1942043	1	330.74	>35 & < 50	>2 cm	Positive	Positive	GSE75067
GSM1942044	1	153.1	>35 & < 50	>2 cm	Positive	Positive	GSE75067
GSM1942045	0	282.38	>35 & < 50	>2 cm	Negative	Positive	GSE75067

**Table S5** Baseline characteristics of patients in training set II and test set II

Characteristic	Training set II (n=239)	Test set II (n=60)	P-value
Age			0.217 <sup>#</sup>
Mean (SD)	43.1 (5.83)	42.0 (6.02)	
Tumor size			0.556 <sup>#</sup>
≤2 cm	70 (29.3%)	19 (31.7%)	
>2 cm & ≤5 cm	132 (55.2%)	35 (58.3%)	
>5 cm	37 (15.5%)	6 (10.0%)	
Nodal status			0.553 <sup>#</sup>
Negative	95 (39.7%)	27 (45.0%)	
Positive	144 (60.3%)	33 (55.0%)	
Hormone receptor status			0.560 <sup>#</sup>
Negative	68 (28.5%)	20 (33.3%)	
Positive	171 (71.5%)	40 (66.7%)	
Overall survival event			1.000 <sup>#</sup>
Alive	210 (87.9%)	53 (88.3%)	
Dead	29 (12.1%)	7 (11.7%)	
Overall survival time			0.677 <sup>#</sup>
Mean (SD)	57.4 (46.2)	55.0 (37.9)	

P-value was generated from comparison of sample characteristics between training set II and test set II. #, Pearson's Chi Square test.