

Supplementary Appendix:**Prevalent case control groups from Cologne**

Lung cancer cases and hospital based controls were recruited in two hospitals in Cologne, Germany (University Hospital Cologne, Lung Clinic Merheim) within two genetic-epidemiological case control trials (Lung Cancer Study (LuCS) and Cologne Smoking Study (CoSmoS)). Healthy blood donors were recruited at the Institute for Transfusion Medicine, University Cologne. A case was defined by the pathological diagnosis of non-small cell lung cancer by histology or cytology. A hospital control was defined by the absence of lung cancer at any time-point of the patient's history which also holds true for healthy blood donors. Individuals were not accepted as controls if they actually suffered from a cancer of the upper respiratory tract, the upper gastrointestinal tract or the urogenital system, since smoking represents a risk factor for the development of these cancer entities. An individual was not accepted for the hospital based control group if the reason for admission was an acute exacerbation of a chronic obstructive pulmonary disease or an acute cardiovascular event (heart attack, cerebral ischemia). These exclusion criteria were due to the simultaneous analysis of risk factors for acute cardiovascular events in CoSmoS.

Lung cancer cases were primarily recruited in the Department of Haematology and Oncology (Department I for Internal Medicine, University Hospital Cologne) and in the Department of Thoracic Surgery (Lung Clinic Merheim). In order to recruit individuals with comparable comorbidity we used hospital based controls that were primarily recruited in the Department of Dermatology and Venerology and in the Department of Orthopaedics and Trauma Surgery at the University Hospital Cologne. Comorbidity of cases and controls was assessed using the medical records of the patients without performing additional examinations.

Computational data analysis:

10 fold cross validation:

For 10-fold cross-validation the whole initial training set (TS) was split 10 times in a ratio of 9:1 into an internal cross-validation training and validation set. Each sample was used only once for each internal validation set. As the number of samples is discrete we generated 7 internal validation sets with 8 samples and 3 validation sets with 7 samples (**supplementary table 1**). The calculation of the T-statistics was performed separately for each internal data set splitting. Based on the identified differentially expressed genes a classifier was built based on each internal training set and applied to the remaining internal validation set. For each internal validation set the sample specific SVM probability scores to be a case were used to build a receiver operator curve. Subsequently, the area under this curve (AUC) was calculated. After separate calculation of 10 AUCs the mean of these 10 AUCs was calculated. This mean AUC was used as read-out for the quality of the classifier. The settings of the best classifier as defined by the maximum mean AUC was used to then build a classifier on the whole training set and applied to two independent validation sets (VS1 and VS2).

Algorithms for classification: We used three different machine learning algorithms (support vector machine (SVM), linear discrimination analysis (LDA), and prediction analysis for microarrays (PAM)) for classification. All three machine learning algorithms were used as implemented in R. The following settings were used for these algorithms.

SVM: SVM is a well established machine learning algorithm for distinction between two groups. Using the Kernel function it allows the identification of an optimal hypergeometric plane. scale = default, leading to an internal scaling of the x and y variable to 0 and unit variance; type = C-classification; kernel = linear; probability = true, allowing for probability predictions.

LDA: prior = default, no indication of prior probability of class membership was used leading to a probability equal to the class distribution in the training set; no additional argument was indicated.

PAM: nfold = 10, a 10-fold cross-validation was used; folds = default, a balanced random cross-validation was used; no further argument was added.

Tables within Supplementary Appendix

Supplementary Table 1: Detailed clinical and epidemiological characteristics of cases with lung cancer and controls recruited for the study

Clinical and epidemiological characteristics of all individuals are given. Age, gender, test score and smoking status are given if known. For lung cancer cases the histopathological diagnosis and the stage is displayed. Finally, comorbidity was documented using the ICD-10 code. In addition for each sample of the training set the membership to the internal validation set in the 10 fold cross validation is indicated with the numbers 1-10. NA = Not applicable.

Supplementary Table 2: Annotation of the 484 features used for the SVM based classifier

The feature list used in the classifier is demonstrated: The 484 features were selected upon identifying differentially expressed genes between cases and controls at a cut-off p-value of the T-statistics of ≤ 0.003 in TS and applied to VS1 and VS2 using SVM. The probe ID, accession number, gene symbol, the difference between the mean expression value of the case and the control group, the ratio between the case and control group and the respective p value of the T test based on TS is given.

Supplemental Table 3: Genetrail analysis results of 484-gene list

All GO terms showing significant enrichment for the lung cancer specific gene list are shown. The number of expected genes, the number of identified genes and the FDR corrected p-value are depicted.

ID	test score	case/control	group	stage	histology	age	sex	smoking status [current/ever=CU=2; ex-smoker=EX=1; never-smoker=NEV]	packyears	internal validation set in TS in 10 fold cross-validation	comorbidity
4320028055_B	0.09581428	NonBC	TS	NA	NA	43	M	2	28	6 0	
4320028055_A	0.9805491	BC	TS	4	AD	45	M	2	31	2 0	
4320028017_D	0.01917373	NonBC	TS	NA	NA	45	M	1	35	9 C43.4, E04.9, E11.9, I10	
4320028017_C	0.8059382	BC	TS	4	AD	46	M	1	34	4 Z88.0	
4320028052_C	0.169129	BC	TS	3	AD	47	F	2	35	6 K22.7, C37, Z90.8, K44, T78.4	
4320028047_F	0.460836	NonBC	TS	NA	NA	47	F	2	34	6 L25, L29	
4320028051_C	0.08977949	BC	TS	3	AD	52	F	2	27	5 M41, K21.9	
4320028053_E	0.123739	BC	TS	4	AD	52	M	1	2	8 0	
4320028053_F	0.6121818	NonBC	TS	NA	NA	53	M	1	3	9 S42.2, Z47.0	
4320028057_E	0.237209	BC	TS	4	AD	53	M	2	45	5 J37.0	
4320028051_D	0.776408	NonBC	TS	NA	NA	54	F	2	26	6 M42, M47, C44, M99.3	
4320028047_B	0.3701559	NonBC	TS	NA	NA	54	M	2	43	4 C43, E78.0, Z86.7, Z92.1	
4320028059_F	0.9019903	BC	TS	3	AD	54	F	2	24	5 I25.9, I64, I25.3, I51.3	
4320028059_E	0.07785803	NonBC	TS	NA	NA	55	F	2	21	1 M48.06, M54.4	
4320028052_D	0.865681	NonBC	TS	NA	NA	55	M	1	33	2 M16.1, K50, L89	
4320028020_E	0.3766547	BC	TS	3	AD	56	F	1	28	7 I10, E03	
4320028059_B	0.4043959	BC	TS	3	AD	57	M	1	74	10 J38.0	
4320028053_B	0.03859415	NonBC	TS	NA	NA	57	F	2	62	3 M50.2, E11, I10, E66, I49.9, I50	
4320028056_D	0.6693036	NonBC	TS	NA	NA	57	M	1	32	1 M30.1, I10, J45, N40	
4320028020_F	0.05601083	NonBC	TS	NA	NA	57	F	1	26	8 M48.06, M54.4	
4320028042_B	0.31024	BC	TS	3	SQ	57	M	1	58	1 0	
4320028057_B	0.1030716	NonBC	TS	NA	NA	58	F	2	1	6 M16, E03.9, E78.0, J44, H33, N80, D25	
4320028056_C	0.4481339	BC	TS	3	SQ	58	M	2	35	3 None	
4320028025_A	0.1192826	BC	TS	4	AD	58	M	2	30	8 F17.2	
4320028025_B	0.03405762	NonBC	TS	NA	NA	58	M	1	28	3 C44.9, E78.0, I10, I20, M10	
4320028025_F	0.082561	NonBC	TS	NA	NA	58	F	1	20	4 0	

4320028046_E	0.06515436	NonBC	TS	NA	NA	58	F	1	43	6 0
4320028042_C	0.8650905	NonBC	TS	NA	NA	59	M	2	57	7 L30.1, B95.6, J44, Z88.0
4320028040_E	0.0473572	NonBC	TS	NA	NA	59	M	1	73	1 D04.3, L57.0
4320028020_A	0.957398	BC	TS	3	AD	59	F	2	28	3 E05.8, Y57.9, M03.6, K21.9, K43.9
4320028053_A	0.5536557	BC	TS	4	SQ	60	F	2	59	5 I10, E89.0, J44, Z90.3, H40
4320028052_A	0.178193	BC	TS	2	AD	60	F	1	2	2 K31.88, M10.0
4320028039_C	0.00808587	NonBC	TS	NA	NA	60	F	1	49	2 C43, G43, M79.7, E03.9
4320028039_D	0.881533	BC	TS	3	AD	60	F	2	48	4 E89.0, E51
4320028052_F	0.7885434	NonBC	TS	NA	NA	60	M	1	65	4 M61.5, F32
4320028046_B	0.06085694	BC	TS	1	SQ	60	M	2	40	7 M48.0, N31.9, C05.2, Z85.8, T78.4
4320028041_D	0.1503482	NonBC	TS	NA	NA	61	M	2	62	9 M48.02, M50.0+
4320028046_A	0.4816362	NonBC	TS	NA	NA	61	M	2	38	10 M16.1, E11, H40
4320028051_F	0.189625	NonBC	TS	NA	NA	61	M	1	62	8 M16.1, I10, J44, E78.0, E79.0
4320028041_C	0.6804874	BC	TS	4	SQ	61	M	2	60	9 I73.9, I10
4320028051_E	0.776243	BC	TS	1	SQ	61	M	2	60	8 J42, E66.9, I25.12, E14.9, I74.0, E78.2, I10, I50.12, I73.9
4320028020_B	3.27853E-07	NonBC	TS	NA	NA	62	F	1	28	3 0
4320028046_C	0.425055	BC	TS	4	SQ	62	M	1	28	9 I25.2, I69.3
4320028047_A	0.03365066	BC	TS	3	SQ	62	M	2	65	7 J44.2, I25.9, I25.2
4320028049_B	0.8496292	NonBC	TS	NA	NA	63	F	1	31	3 M53.26, M54.4, I10, E03.9
4320028053_C	0.9142011	BC	TS	2	SQ	63	M	1	32	8 I10, I25.19, I71.4
4320028053_D	0.3329618	NonBC	TS	NA	NA	63	M	1	30	5 M48.06, M54.4, I10, E79.0
4320028046_D	0.0111092	NonBC	TS	NA	NA	63	M	1	28	7 C44.3, E04.0, N40
4320028040_D	0.0947095	NonBC	TS	NA	NA	63	M	1	54	7 0
4320028055_C	0.968009	BC	TS	3	AD	63	M	1	52	1 0
4320028055_D	0.01521911	NonBC	TS	NA	NA	64	M	1	54	1 M54.4, M99.7, I49.9, N40, E78.0
4320028049_D	0.01749572	NonBC	TS	NA	NA	64	F	2	27	10 D22.7, I89.0, I10, E66, J44, M35.3, E78.0, Z88.0, J45
4320028049_C	0.07160309	BC	TS	2	AD	64	F	2	29	10 J44, E78, I70, I10
4320028049_A	0.8565266	BC	TS	1	AD	65	F	2	33	1 I10, Z86.1, Z85.5
4320028040_B	0.7572701	NonBC	TS	NA	NA	65	F	1	22	2 M48.06, M54.4, E03.9, F32
4320028051_A	0.8747869	BC	TS	3	AD	65	M	1	14	3 I10, E89.0
4320028051_B	0.1223665	NonBC	TS	NA	NA	66	M	1	14	5 C44.3, I10, E78.0, E79.0, T81.4
4320028056_B	0.324978	NonBC	TS	NA	NA	67	M	1	14	5 M17.1, M99.3, G95.1, N40, I35.0, I10
4320028059_C	0.9247467	BC	TS	3	SQ	67	M	2	53	10 J44
4320028042_A	0.1574159	NonBC	TS	NA	NA	68	M	1	53	4 C44.3, E11, E78.0, I10, I73.9
4320028056_A	0.3250888	BC	TS	3	AD	68	M	1	14	6 0
4320028056_F	0.6559103	NonBC	TS	NA	NA	68	M	2	36	4 S32.0
4320028039_B	0.004752357	NonBC	TS	NA	NA	68	M	2	25	10 C44.2, I10, L30, M51.2, J44
4320028055_E	0.9351274	BC	TS	2	AD	68	M	1	45	2 Z86.1, Z90.3, Z90.4
4320028055_F	0.5298929	NonBC	TS	NA	NA	69	M	1	49	8 L20, L29, I10, I50, D50, Z85.0
4320028017_B	0.4038866	NonBC	TS	NA	NA	70	M	1	54	6 T84.0, Z96.6, I25.1, I10, E87.6

4320028049_E	0.1051068	BC	TS	3	AD	70	M	1	87	3 K70.3, G62.1, K25.-, I10, I50, I73.9, H27.1, H62.9, J44
4320028041_B	0.01276768	NonBC	TS	NA	NA	71	M	1	58	9 L40, J44, I10, L27.0
4320028056_E	0.7631878	BC	TS	1	AD	71	M	2	36	1 I10, E89.0, Z85.8
4320028020_D	0.09900441	NonBC	TS	NA	NA	71	F	1	30	7 0
4320028041_F	0.1657231	NonBC	TS	NA	NA	71	M	1	16	7 B86, L02.0, I10, L40
4320028039_A	0.98386	BC	TS	3	LC	71	M	1	26	2 Z85.5, N18.82, I15.1, R53, J96.1
4320028041_A	0.981274	BC	TS	1	AD	72	M	1	60	4 I10, I25
4320028042_D	0.1749531	BC	TS	3	AD	72	M	2	50	10 K25, N28.1, Z89.0
4320028049_F	0.6104273	NonBC	TS	NA	NA	73	M	1	87	5 M48.06, M54.4, E78.0, C44, M06.0, J45, Z95.0, I49.9
4320028025_D	0.01001797	NonBC	TS	NA	NA	73	M	1	34	2 M48.06, M54.4, I73.9, E10, J44, I49.9, E79.0, E78, I10
4320028025_C	0.7652697	BC	TS	2	AD	75	M	1	34	9 I25.9, I20.9, I10, N40, E79.0
1723260256_F	0.0000	NonBC	VS1	NA	NA	46	M	2	27	NA C49.2, H66.9, H90
1692272055_A	0.0046	NonBC	VS1	NA	NA	48	M	2	29	NA M42, M51.2
1692272050_C	0.7929	BC	VS1	4	AD	48	F	2	37	NA I30.9
1692272050_D	0.0034	NonBC	VS1	NA	NA	50	F	2	30	NA L23, L40, I10
1723260265_D	0.0597	NonBC	VS1	NA	NA	50	F	2	33	NA L50, L23.0, M81
1692272051_D	0.0096	BC	VS1	1	SQ	50	M	2	27	NA I20, I70.2, E78.2, I25.12, I25.22, N18, F12
1723260265_E	0.0041	NonBC	VS1	NA	NA	51	F	1	33	NA Q82.2, Z88.1, C43, J44, Z88.6, E89.0
4202996068_B	0.2360	BC	VS1	4	AD	52	F	2	30	NA
1692272051_B	0.0247	NonBC	VS1	NA	NA	53	F	1	25	NA M16.1, Z96.6, E78.0
1692272055_F	0.0000	BC	VS1	4	LC	53	M	2	14	NA K08.9, T78.1
1692272050_F	0.0082	NonBC	VS1	NA	NA	54	M	2	37	NA M53.26, M96.1, J44, I10, J42
4202996064_A	0.8747	BC	VS1	4	AD	55	M	2	41	NA K80.2
1692272050_A	0.0363	BC	VS1	3	AD	56	F	1	42	NA I11.9, J44.1, I10, E87.6
4202996068_D	0.0137	BC	VS1	1	AD	57	M	2	85	NA F10.2
1692272051_E	0.0000	NonBC	VS1	NA	NA	58	M	2	37	NA Z01.5, I50, I10, J44, E79.0, Z88.0, Z88.4
1692272049_B	0.0031	NonBC	VS1	NA	NA	61	M	2	114	NA C44.3, J45, Z88.0
4202996068_A	0.1403	BC	VS1	1	AD	61	M	1	50	NA
4202996064_D	0.2291	BC	VS1	3	SQ	61	M	1	68	NA E11, I10, E79.0
4202996086_F	0.4631	NonBC	VS1	NA	NA	61	F	1	7	NA M51.2, M54.4, G57.6
4202996086_B	0.8028	BC	VS1	4	AD	61	M	0	NA	NA Z96.6, I10
1692272049_D	0.0876	NonBC	VS1	NA	NA	62	F	1	7	NA M16.1, D17.0, Z98.1, T81.0
1723260265_F	0.0153	NonBC	VS1	NA	NA	62	M	1	38	NA M46.4, M42, K26, I10, E78
4202996064_C	0.6303	BC	VS1	3	AD	62	M	2	40	NA
4202996064_F	0.0260	BC	VS1	3	SQ	62	M	1	10	NA
4202996068_C	0.3248	BC	VS1	4	AD	62	F	2	11	NA
1692272051_A	0.0103	BC	VS1	2	AD	62	F	1	23	NA J44.8
4202996067_B	0.6250	BC	VS1	4	AD	63	F	2	48	NA K38.9, E02, N15.10
1692272049_E	0.1204	BC	VS1	3	SQ	63	M	1	35	NA I10, M15.9, L40.0; N18.9; K25, Z96.6
1723260256_B	0.0151	NonBC	VS1	NA	NA	65	M	2	11	NA M48.06, M54.4, J44, G95.1, M42

1723260265_A	0.2248	NonBC	VS1	NA	NA	65	F	1	49	NA
1692272051_C	0.4430	BC	VS1	1	AD	67	F	2	56	NA H34.2, K25, F32.9, C08.0
1723260256_E	0.0130	NonBC	VS1	NA	NA	67	M	1	37	NA T84.5, Z96.6, M17, I63.9, G20, F32
1723260256_A	0.4195	NonBC	VS1	NA	NA	67	M	1	60	NA B02.7, C90.0, Z94.8, I10
1692272050_E	0.0131	NonBC	VS1	NA	NA	67	F	1	17	NA M48.06, M54.4, I10, M16, J45
4202996086_E	0.0175	NonBC	VS1	NA	NA	68	M	1	37	NA M19.9, Z98.1, I10
4202996067_A	0.0232	BC	VS1	3	SQ	68	F	2	NA	NA D32, J44, M51.2
1723260265_B	0.0000	NonBC	VS1	NA	NA	69	M	1	105	NA
4202996064_E	0.0279	BC	VS1	1	SQ	69	M	2	62	NA M42.16, I21.9, R09.1, N20.0, I10
4202996086_D	0.4533	BC	VS1	3	SQ	69	M	2	39	NA J44, I35.0
1692272049_C	0.0919	BC	VS1	1	AD	69	M	2	64	NA K38.9, E14, J42, J96.9, I42.0, I20.9, I10
1692272055_C	0.3188	BC	VS1	4	AD	69	M	2	40	NA I10, I69.3, J44,
1723260256_C	0.0319	NonBC	VS1	NA	NA	70	F	2	26	NA L40, E66, I10, M17, K45, E61.1
1692272051_F	0.0000	NonBC	VS1	NA	NA	70	F	1	28	NA M48.06, M54.4, M42, I35.1, M17, I10,
4202996064_B	0.7601	BC	VS1	3	AD	71	M	2	34	NA
1692272049_F	0.0284	BC	VS1	2	SQ	71	F	1	49	NA I70.2, I10, I27.0, I25.2, I25.1, Z95.0, Z95.2, E11, J44
1692272049_A	0.0075	NonBC	VS1	NA	NA	71	M	2	9	NA M65, M25.4, Z96.6, N40, N39.4
4202996067_E	0.8885	BC	VS1	3	SQ	72	M	2	104	NA S68.1, D35.0
1692272050_B	0.0262	NonBC	VS1	NA	NA	72	M	1	26	NA C43, C79.3, C61, Z95.2, I10, E78.0, K80, Z88.0,
1692272055_E	0.0278	BC	VS1	3	AD	73	M	1	35	NA I64, I10, I71.4
1723260265_C	0.0000	NonBC	VS1	NA	NA	73	M	1	53	NA
1723260253_B	0.0000	NonBC	VS1	NA	NA	76	M	1	39	NA C44.3, I10, E78.0, L80, D33.3
1723260256_D	0.0000	NonBC	VS1	NA	NA	76	M	1	45	NA M17, E11, J44, I10, C61
4202996086_A	0.0228	BC	VS1	3	AD	77	M	1	37	NA I69.3, A16.8, A17,B90.0, G45, J15, M81, M24.66, I10
4202996067_F	0.0895	BC	VS1	3	SQ	78	M	1	53	NA
1888857105_E	0.00737855	NonBC	VS2	NA	NA	23	W	NA	NA	NA
1888857127_B	0.023446353	NonBC	VS2	NA	NA	23	M	NA	NA	NA
1888857129_A	0.024493655	NonBC	VS2	NA	NA	23	M	NA	NA	NA
1888857188_E	0.054824238	NonBC	VS2	NA	NA	27	W	NA	NA	NA
1888857149_B	0.00546767	NonBC	VS2	NA	NA	27	W	NA	NA	NA
1888857133_E	0.005496796	NonBC	VS2	NA	NA	27	W	NA	NA	NA
1888857119_B	0.021799696	NonBC	VS2	NA	NA	27	W	NA	NA	NA
1888857107_F	0.00876556	NonBC	VS2	NA	NA	27	W	NA	NA	NA
1888857125_A	0.04175868	NonBC	VS2	NA	NA	28	W	NA	NA	NA
1888857150_F	0.04364631	NonBC	VS2	NA	NA	28	W	NA	NA	NA
1888857127_E	0.182647724	NonBC	VS2	NA	NA	28	W	NA	NA	NA
1888857133_F	0.008448534	NonBC	VS2	NA	NA	29	W	NA	NA	NA
1888857188_F	0.009726405	NonBC	VS2	NA	NA	29	W	NA	NA	NA
1888857133_B	0.026182548	NonBC	VS2	NA	NA	32	M	NA	NA	NA
1888857188_A	0.003590508	NonBC	VS2	NA	NA	32	W	NA	NA	NA

1888857127_C	0.022309932	NonBC	VS2	NA	NA	32	M	NA	NA	NA
1888857174_F	0.002621483	NonBC	VS2	NA	NA	35	W	NA	NA	NA
1888857129_D	0.029945138	NonBC	VS2	NA	NA	35	W	NA	NA	NA
1888857174_E	0.033579231	NonBC	VS2	NA	NA	37	M	NA	NA	NA
1888857127_F	0.012053614	NonBC	VS2	NA	NA	37	W	NA	NA	NA
1888857129_C	0.034473495	NonBC	VS2	NA	NA	37	M	NA	NA	NA
1888857128_C	0.003328873	NonBC	VS2	NA	NA	38	M	NA	NA	NA
1888857188_B	0.003947947	NonBC	VS2	NA	NA	39	W	NA	NA	NA
1888857105_F	0.018635832	NonBC	VS2	NA	NA	40	M	NA	NA	NA
1888857129_E	1.10E-06	NonBC	VS2	NA	NA	40	W	NA	NA	NA
1888857107_E	0.084934349	NonBC	VS2	NA	NA	41	M	NA	NA	NA
1888857149_D	0.158893275	NonBC	VS2	NA	NA	41	W	NA	NA	NA
1888857173_F	0.005676924	NonBC	VS2	NA	NA	42	M	NA	NA	NA
1888857119_D	0.052813861	NonBC	VS2	NA	NA	42	M	NA	NA	NA
1888857133_A	0.015250513	NonBC	VS2	NA	NA	42	M	NA	NA	NA
1888857173_E	1.42E-06	NonBC	VS2	NA	NA	43	W	NA	NA	NA
1888857105_C	0.005640786	NonBC	VS2	NA	NA	43	M	NA	NA	NA
1888857119_C	0.033642363	NonBC	VS2	NA	NA	43	M	NA	NA	NA
1888857149_E	0.036362234	NonBC	VS2	NA	NA	43	M	NA	NA	NA
1888857150_D	0.002837433	NonBC	VS2	NA	NA	43	W	NA	NA	NA
1888857127_D	0.028431358	NonBC	VS2	NA	NA	44	W	NA	NA	NA
1888857119_F	0.016676608	NonBC	VS2	NA	NA	45	M	NA	NA	NA
1888857174_B	0.022433938	NonBC	VS2	NA	NA	45	W	NA	NA	NA
1888857125_E	0.022105055	NonBC	VS2	NA	NA	46	W	NA	NA	NA
1888857107_C	0.11273154	NonBC	VS2	NA	NA	46	W	NA	NA	NA
1888857129_B	0.252705084	NonBC	VS2	NA	NA	47	M	NA	NA	NA
1888857150_A	1.29E-06	NonBC	VS2	NA	NA	48	M	NA	NA	NA
1888857149_F	0.005224801	NonBC	VS2	NA	NA	48	M	NA	NA	NA
1888857174_D	0.30115126	NonBC	VS2	NA	NA	48	M	NA	NA	NA
1888857105_D	5.01E-08	NonBC	VS2	NA	NA	49	W	NA	NA	NA
1888857128_D	0.004560159	NonBC	VS2	NA	NA	49	M	NA	NA	NA
1888857174_C	0.007294291	NonBC	VS2	NA	NA	49	W	NA	NA	NA
1888857107_D	0.019506531	NonBC	VS2	NA	NA	49	M	NA	NA	NA
1888857128_A	0.04020865	NonBC	VS2	NA	NA	49	M	NA	NA	NA
1888857127_A	0.216873415	NonBC	VS2	NA	NA	49	M	NA	NA	NA
1888857129_F	1.01E-05	NonBC	VS2	NA	NA	50	W	NA	NA	NA
1888857105_B	0.005431746	NonBC	VS2	NA	NA	51	M	NA	NA	NA
1888857149_A	0.029788258	NonBC	VS2	NA	NA	51	M	NA	NA	NA
1888857150_C	0.040063319	NonBC	VS2	NA	NA	52	W	NA	NA	NA
1888857128_E	7.39E-06	NonBC	VS2	NA	NA	53	W	NA	NA	NA

1888857128_B	0.006052823	NonBC	VS2	NA	NA	53	M	NA	NA	NA	
1888857150_E	0.108095265	NonBC	VS2	NA	NA	54	W	NA	NA	NA	
1888857105_A	0.010814913	NonBC	VS2	NA	NA	54	M	NA	NA	NA	
1888857125_D	8.44E-06	NonBC	VS2	NA	NA	55	M	NA	NA	NA	
1888857122_D	0.028453074	NonBC	VS2	NA	NA	55	M	NA	NA	NA	
1888857122_C	0.028920162	NonBC	VS2	NA	NA	55	W	NA	NA	NA	
1888857125_C	0.005031964	NonBC	VS2	NA	NA	56	W	NA	NA	NA	
1888857150_B	2.36E-06	NonBC	VS2	NA	NA	57	W	NA	NA	NA	
1888857107_B	1.21E-05	NonBC	VS2	NA	NA	58	M	NA	NA	NA	
1888857125_F	0.010414347	NonBC	VS2	NA	NA	59	W	NA	NA	NA	
1888857128_F	0.016766545	NonBC	VS2	NA	NA	63	M	NA	NA	NA	
1888857174_A	0.018684792	NonBC	VS2	NA	NA	63	W	NA	NA	NA	
1888857107_A	0.03686927	NonBC	VS2	NA	NA	63	M	NA	NA	NA	
1888857149_C	0.021046459	NonBC	VS2	NA	NA	64	M	NA	NA	NA	
1888857119_E	0.011605499	NonBC	VS2	NA	NA	65	M	NA	NA	NA	
5100836003_D	0.016249214	BC	VS2	1	AD	67	M	1	NA	NA	J44, S22
5100836009_D	0.16785111	BC	VS2	1	AD	67	M	1	42	NA	
5100836013_B	0.239580157	BC	VS2	1	AD	82	M	1	61	NA	J44, I64, I25, I48, K56, H54
5038446002_E	0.5	BC	VS2	1	AD	67	M	1	NA	NA	I10, E11, E03, H26
5100836002_F	0.57475258	BC	VS2	1	AD	80	F	2	0	NA	C46, I51, I34, E78
5100836006_B	0.592040767	BC	VS2	1	AD	49	F	1	26	NA	M46, Z90.7, N94
5100836004_C	0.637352988	BC	VS2	1	AD	69	M	1	68	NA	
5100836004_B	0.700508449	BC	VS2	1	AD	59	M	1	50	NA	I10, I25, I48, K86, K81, G47
5038446003_A	0.71063833	BC	VS2	1	AD	40	M	1	20	NA	J98
5100836009_A	0.755234102	BC	VS2	1	AD	63	F	1	28	NA	C50, I70
5100836020_A	0.777527902	BC	VS2	1	AD	76	F	0	45	NA	I48, I10, E11, D41.0, M17, I47, I47
5100836015_C	0.808283975	BC	VS2	1	AD	47	F	1	22	NA	I10, M17, N80, E66, R68
5100836007_C	0.827627997	BC	VS2	1	AD	67	F	1	18	NA	I10, M25, D44
5100836011_A	0.837734801	BC	VS2	1	AD	57	F	1	41	NA	E66, F10, I83, F32
5100836002_D	0.866238276	BC	VS2	1	AD	72	M	1	84	NA	N40, K29, K63
5100836021_B	0.909693782	BC	VS2	1	AD	59	M	1	44	NA	
5100836010_D	0.914485282	BC	VS2	1	AD	71	M	1	NA	NA	E11, I47, I48
5100836007_F	0.929046427	BC	VS2	1	AD	50	F	NA	NA	NA	
5100836015_E	0.945060624	BC	VS2	1	AD	72	F	NA	NA	NA	
5100836015_D	0.951793756	BC	VS2	1	AD	53	M	1	68	NA	F10
5038446003_C	0.968194225	BC	VS2	1	AD	78	F	1	0	NA	I10
5038446002_D	0.976279644	BC	VS2	1	AD	77	F	1	23	NA	C50
5100836021_A	0.996045383	BC	VS2	1	AD	70	F	1	96	NA	I10, J44, E03, M25
5100836003_C	0.146592859	BC	VS2	1	LC	53	F	1	24	NA	J44
5038446002_A	0.196183409	BC	VS2	1	LC	63	F	1	38	NA	I10, J44, K80, M72

5100836003_E	0.518389535	BC	VS2	1	LC	58	M	1	NA	NA
5100836013_A	0.601190711	BC	VS2	1	LC	65	F	1	29	NA I48, E11, C54, E05, I47
5038446003_E	0.927960824	BC	VS2	1	LC	74	M	2	87	NA G20, N20, E66, N40
5100836011_B	0.653522817	BC	VS2	1	SQ	64	M	1	42	NA J44, I10, K43, N40
5100836009_E	0.967087408	BC	VS2	1	SQ	72	M	1	107	NA I49, I10, I25, J44
5100836019_C	0.996713809	BC	VS2	1	SQ	72	M	1	32	NA I49, I48, I25, I10, E78, E11 , E66, I70, J44, C61, I71, N18, I50
5100836006_A	0.998490168	BC	VS2	1	SQ	74	F	1	27	NA

ProbeId	Gid	Accession	Symbol	Diff	Fold change	Ttest_p_value
2370524	26051242	NM_007115.2	TNFAIP6	-189.5036814	-2.042699099	1.09E-06
510450	29789089	NM_018715.1	RCC2	88.67276932	1.267465318	1.24E-05
4760543	34335248	NM_153719.2	NUP62	118.4147225	1.307105002	1.39E-05
7550537	4502098	NM_001152.1	SLC25A5	326.6719362	1.197818187	1.44E-05
6270128	58331233	NM_000074.2	CD40LG	19.30987052	1.299106772	1.76E-05
2630484	88986422	XM_927593.1	ATP10B	-3.310535431	-1.078587107	1.93E-05
520332	22165415	NM_000155.2	GALT	15.96763751	1.182575744	2.05E-05
4900053	17978510	NM_014281.3	SIAHBP1	189.9410753	1.323848811	2.21E-05
4730195	21264599	NM_003543.3	HIST1H4H	-35.48000424	-1.386734739	2.49E-05
4280332	14251213	NM_020414.3	DDX24	75.4163163	1.309570343	3.02E-05
1110215	14149679	NM_015292.1	FAM62A	222.9573258	1.428150347	3.25E-05
670041	50477326	CR596519		548.9905075	1.522206107	3.32E-05
650164	4503240	NM_000896.1	CYP4F3	-315.5464725	-1.429419775	3.55E-05
3460674	47419935	NM_003137.3	SRPK1	-139.764433	-1.440777018	3.60E-05
1820598	12545398	NM_000873.2	ICAM2	182.5185371	1.351682752	3.89E-05
6960746	55774984	NM_018384.3	GIMAP5	223.2919717	1.382086438	4.02E-05
3120301	51173749	NM_031488.4	L3MBTL2	23.21749718	1.214091824	4.02E-05
3360364	7662339	NM_014941.1	MORC2	54.87417822	1.317774309	4.03E-05
6110768	39725714	NM_004044.4	ATIC	72.99433158	1.297103547	4.63E-05
3990639	36748	X00437		771.7174513	1.555765766	4.83E-05
7150634	5902011	NM_006901.1	MYO9A	15.79647532	1.176790608	4.89E-05
6590386	20149679	NM_024619.2	FN3KRP	63.48415847	1.276544672	4.98E-05
5690037	31543829	NM_013270.2	TSP50	-4.520475047	-1.093650977	5.40E-05
1780348	70908369	NM_018285.2	IMP3	148.6064801	1.240632612	5.80E-05
450037	55925577	NM_002348.2	LY9	64.18668944	1.337080038	7.31E-05
4540082	58331160	NM_015651.1	PHF19	27.47614989	1.23686341	7.56E-05
6380598	15529981	NM_033416.1	IMP4	34.49530681	1.205303684	7.96E-05
3520192	47132578	NM_004401.2	DFFA	13.05479272	1.196479136	7.97E-05
7380288	34147585	NM_016237.3	ANAPC5	91.54539975	1.176438251	8.97E-05
2450497	314309	T03068		2.937619578	1.076034692	9.15E-05
6980070	13929470	NM_004776.2	B4GALT5	-121.2712825	-1.387482292	9.61E-05
5390131	33469915	NM_003906.3	MCM3AP	32.02638688	1.143678564	0.000106053
1240603	34452172	NM_000887.3	ITGAX	-22.98226817	-1.222173081	0.000107483
5900156	57013275	NM_006082.2	K-ALPHA-1	543.1415197	1.219305455	0.000108016
2190673	41281472	NM_014738.2	KIAA0195	45.96224495	1.262020095	0.000110774
2690609	62526019	NM_001014433.2	CUTA	223.2296564	1.301630178	0.000120692
1580348	25141321	NM_015039.2	NMNAT2	6.84304916	1.124383533	0.000120767
4220138	89057421	XM_940198.1	LOC651076	10.13757955	1.165397115	0.000128251
4850192	51036597	NM_006725.2	CD6	216.5093624	1.520125461	0.000132444
6480500	24797073	NM_033554.2	HLA-DPA1	588.5023681	1.477667953	0.000133302
7100136	41352720	NM_078483.2	SLC36A1	-133.4968039	-1.427691893	0.000133553
3610504	38788307	NM_005476.3	GNE	18.30602894	1.161672234	0.000133964
2630451	22027639	NM_003528.2	HIST2H2BE	-106.9694117	-1.398553482	0.000134858
3520082	4506752	NM_003707.1	RUVBL1	11.02056207	1.158636454	0.000135201
7160296	70980548	NM_014976.1	PDCD11	21.33989507	1.221159345	0.000135859
1050128	8515897	AF272739		5.425986954	1.113600395	0.000136921
4730577	39890659	CK300859		-3.693681288	-1.089073255	0.000137667
6280754	18426908	NM_080816.1	SIRPB2	30.07920138	1.308367153	0.000139409
5960035	24850108	NM_170699.1	GPBAR1	100.9412072	1.463343623	0.00015651
5910091	30425443	NM_178510.1	ANKK1	2.967139784	1.069192658	0.000157493
1430292	40254427	NM_000578.2	SLC11A1	-53.76208405	-1.426845286	0.000167687
4210647	13375800	NM_024600.1	C16orf30	31.66193318	1.346066522	0.000170914
3460189	31652246	NM_139244.2	STXBP5	-30.43225917	-1.285955466	0.000172103
3140093	47717138	NM_006767.2	LZTR1	65.30433309	1.271997612	0.000186989
5700403	31982913	NM_032118.2	WDR54	67.77289263	1.331399486	0.000188678
160132	59938769	NM_182898.2	CREB5	-262.1114924	-1.445071565	0.00019583
460754	47078254	NM_212530.1	CDC25B	218.4805426	1.466578356	0.000195968
1440601	28872781	NM_016408.2	CDK5RAP1	25.2613611	1.174006584	0.000202701
3830390	89035828	XM_930898.1	KIAA0692	-2.717873701	-1.079778284	0.000205305
5860196	23659890	BU733214		-2.809152673	-1.07025823	0.000218212
3420735	40556369	NM_015288.4	PHF15	69.78943303	1.295589549	0.000222283
7050543	32967306	NM_182480.1	COQ6	13.29427898	1.129169056	0.000225323
6270021	14141153	NM_031203.1	HNRPM	175.5084406	1.233305528	0.00023295
5290289	34147412	NM_032312.2	YIPF4	-50.40343731	-1.306637842	0.000234467
6590523	56119213	NM_024711.3	GIMAP6	61.57201639	1.19443786	0.000236996
1710286	21536460	NM_002405.2	MFNG	186.80371	1.213068636	0.000240549
2630154	56676368	NM_031412.2	GABARAPL1	-174.3602129	-1.301676261	0.000244873
2640609	45827727	NM_005980.2	S100P	-390.18098	-1.598605763	0.000253144

6020402	24497619	NM_014230.2	SRP68	28.09091984	1.155068368	0.000260218
5550746	63029931	NM_152272.2	CHMP7	43.03363654	1.222857885	0.00026052
4060131	4758669	NM_004811.1	LPXN	169.3070648	1.22742049	0.000265747
160736	7706484	NM_016292.1	TRAP1	20.89088823	1.24310651	0.000270249
610563	14141173	NM_002129.2	HMGB2	-47.59152899	-1.553030021	0.000271029
3840022	12707569	NM_004092.2	ECHS1	48.95693214	1.230257197	0.000274708
20647	40807451	NM_015062.3	PPRC1	20.40411099	1.172512955	0.000283424
6290431	49472821	NM_003755.2	EIF3S4	289.038097	1.265068842	0.000284449
3370687	16445420	NM_052837.1	SCAMP3	67.26265306	1.266481175	0.000291089
5310754	55956897	NM_015935.4	KIAA0859	13.16095145	1.140721813	0.000296022
2710397	24497489	NM_003059.2	SLC22A4	-40.49246287	-1.28631942	0.000298583
7320576	4503512	NM_003757.1	EIF3S2	92.09473895	1.176647021	0.000308301
7150017	58331183	NM_006429.2	CCT7	38.59039574	1.316676229	0.000311432
4850541	75750528	NM_016552.2	ANKMY1	2.735334806	1.065736829	0.000317215
6100220	6005951	NM_007255.1	B4GALT7	29.14447929	1.228247363	0.000318886
10541	13194198	NM_023003.1	TM6SF1	-42.63413583	-1.328994185	0.000319057
3170092	52851435	NM_015710.3	GLTSCR2	951.7801905	1.265887651	0.000319621
5720398	31341089	NM_173791.2	PDZD8	-20.13545497	-1.240924613	0.000321296
4540301	45827722	NM_206914.1	KFZP586D0919	11.93196859	1.166543095	0.000322081
2100035	31543661	NM_004226.2	STK17B	-56.28618761	-1.375543946	0.000323173
5090477	20336255	NM_138687.1	PIP5K2B	4.198748845	1.077633516	0.000323344
2680370	52426773	NM_019111.3	HLA-DRA	817.1291554	1.377401879	0.000326414
130403	56550113	NM_006567.2	FARS2	15.61874075	1.144473414	0.000328093
6290561	88998614	XM_936120.1	HLA-DQA1	315.8964785	1.64433008	0.000329596
5390669	5453556	NM_006321.1	ARIH2	43.41521242	1.16984795	0.000330449
2760563	77404351	NM_001414.2	EIF2B1	26.53165567	1.152983904	0.000332202
1440382	33359700	NM_182688.1	UBE2G2	39.95896434	1.258246254	0.000339206
2260446	89027447	XM_935843.1	LOC653832	-3.084729823	-1.078584595	0.000346447
2030544	89026490	XM_936353.1	LOC642196	6.598817511	1.139296555	0.000346604
6940242	13128859	NM_004964.2	HDAC1	149.0464951	1.226649864	0.000355245
1440546	73486657	NM_002080.2	GOT2	48.7873308	1.230560635	0.00035799
5270500	16936531	NM_000075.2	CDK4	39.00645813	1.28126712	0.000367439
5130082	20149593	NM_007355.2	HSP90AB1	101.2393963	1.291963927	0.000372701
2750408	88971019	XM_939707.1	RUVBL1	16.22168355	1.191413103	0.000375432
6980274	16199327	BI915661		3.572189393	1.088541696	0.000376532
4200538	7657121	NM_015721.1	GEMIN4	29.79545919	1.244092425	0.000387475
6550142	6552335	NM_003819.2	PABPC4	43.32832748	1.217948334	0.000387574
7000408	13376877	NM_025263.1	PRR3	10.71405587	1.132753454	0.000391734
3140246	40255000	NM_033111.2	LOC88523	-78.75175311	-1.287078764	0.000391929
4230653	24497586	NM_139247.2	ADCY4	-35.6351327	-1.270463437	0.000397239
5310653	6912575	NM_012387.1	PADI4	-903.4667472	-1.39120355	0.000399258
3420343	46409267	NM_207311.1	CCDC64	30.70426568	1.287470221	0.00040278
4150402	2963496	AA868051		2.919731911	1.06730094	0.000407376
2100333	38683839	NM_198196.1	CD96	51.45503197	1.281782623	0.000407931
4150161	4502676	NM_001779.1	CD58	-48.65350702	-1.342517485	0.000410831
4880364	13129091	NM_024092.1	TMEM109	61.87509923	1.260473608	0.0004333
2230661	20428651	NM_005356.2	LCK	28.15648785	1.240489001	0.000447815
380685	34147607	NM_015953.3	NOSIP	201.9140045	1.2941855	0.00044799
2450343	27828388	BX096685		4.718261846	1.099375057	0.000459923
6840408	2354214	AA576740		2.46572254	1.061515186	0.000464263
7000133	12597634	NM_022898.1	BCL11B	87.76854653	1.366299623	0.000470008
1430762	6005791	NM_007199.1	IRAK3	-155.6188523	-1.621269505	0.000474504
3140039	21314659	NM_016230.2	CYB5R4	-69.25618425	-1.320679261	0.000474673
2900524	41352701	NM_001384.3	DPH2	30.82374927	1.211102665	0.000489612
6480170	52632380	NM_001005333.1	MAGED1	44.33620059	1.280407525	0.000496684
4120133	31542722	NM_022827.2	SPATA20	22.43434012	1.234512657	0.000496736
1170307	23238195	NM_000878.2	IL2RB	146.6316959	1.40578311	0.000500983
1110575	51173716	NM_006720.3	ABLIM1	178.3940667	1.414951976	0.000520001
4780743	4885224	NM_005243.1	EWSR1	65.31825131	1.149756619	0.000520842
7150601	7661785	NM_014165.1	C6orf66	6.495115777	1.112031506	0.000522811
5310050	12232384	NM_022730.1	COPS7B	20.43313854	1.159974145	0.000523392
3130091	46358357	NM_017905.3	TMCO3	-52.34722897	-1.291560219	0.000525503
4860132	7662451	NM_015239.1	AGTPBP1	-78.07936872	-1.251820938	0.000529903
3780689	70608210	NM_016489.11	NTSC3	-33.80520978	-1.29663174	0.000530225
1030692	27436906	NM_004927.2	MRPL49	41.36497592	1.196106353	0.000541915
4830435	39812071	NM_030811.3	MRPS26	24.14041112	1.209465158	0.000546594
3440431	29337284	NM_012110.2	CHIC2	-117.5328049	-1.216145457	0.000549514
4830563	33620778	NM_012321.2	LSM4	46.65393084	1.19050163	0.000557036
3940368	89057924	XM_928933.1	FLJ32154	2.730511524	1.07060656	0.000558628

1980424	13129119	NM_024108.1	TRAPPC6A	30.5100061	1.204130632	0.000560504
3130711	22748936	NM_020750.1	XPO5	12.09222819	1.135424285	0.000572639
620722	4506444	NM_002896.1	RBM4	43.5385138	1.203671935	0.000578613
3400504	66933015	NM_000884.2	IMPDH2	69.11593701	1.25700787	0.000583684
2750521	57634533	NM_015135.1	NUP205	29.42766456	1.221266897	0.000585225
4060056	55749643	NM_015054.1	KIAA0701	-12.83668481	-1.132436687	0.000597219
4640044	21040335	NM_138931.1	BCL6	-5.775066733	-1.123194426	0.00060429
6110537	88967388	XM_931928.1	LOC642816	2.637522553	1.065666772	0.000612974
4640528	13435126	NM_025228.1	TRAF3IP3	75.87438371	1.216408031	0.000615875
5860400	19557649	NM_021052.2	HIST1H2AE	-11.74106542	-1.218947418	0.000618118
3420630	45331203	NM_007181.3	MAP4K1	141.7841323	1.45743426	0.000621345
4180142	51093838	NM_016091.2	EIF3S6IP	296.2042703	1.221453733	0.000621455
6350364	41872408	NM_002704.2	PPBP	-761.2674927	-1.534280038	0.000630226
2760092	34147517	NM_005449.3	FAIM3	201.7565646	1.409529365	0.000634628
990273	34222323	NM_015380.3	SAMM50	47.44338392	1.204119339	0.00063726
3990465	89038158	XM_496059.2	LOC440261	2.890329302	1.065568707	0.000641851
1260228	10863876	NM_021105.1	PLSCR1	-53.52413775	-1.457234006	0.00064387
4860296	42558244	NM_032320.4	BTBD10	-25.33553958	-1.203571466	0.000644443
1300768	24497575	NM_006066.2	AKR1A1	80.92050915	1.237851126	0.000645996
840730	40786401	NM_199337.1	LOC374395	170.1866859	1.178701902	0.000665379
1110358	27469749	BC041984		-5.896873872	-1.109233545	0.000669438
5130767	52352808	NM_005902.3	SMAD3	27.20027806	1.165895949	0.00067007
6980609	40255221	NM_178839.3	LRRTM1	-3.098540364	-1.074788366	0.000677469
2630719	57222567	NM_005937.2	MLLT6	67.91872541	1.270330562	0.000681074
7380274	68509917	NM_007167.2	ZMYM6	52.66472418	1.182129748	0.000687399
6480328	39725684	NM_025150.3	TARSL1	6.593485366	1.123027001	0.000690243
3370605	45237199	NM_020808.1	SIPA1L2	-58.97844017	-1.454432546	0.000697156
5820348	48314819	NM_017570.1	OPLAH	-45.18509526	-1.400708228	0.000703103
130113	56699400	NM_052901.2	SLC25A25	18.42042548	1.167822465	0.000707163
6860243	24430138	NM_015540.2	RPAP1	7.937422972	1.134855062	0.00071637
1400270	20336247	NM_004716.2	PCSK7	94.29387128	1.302793128	0.000716583
5310136	75991708	NM_001033667.1	LY9	33.64428254	1.319047944	0.000716611
5890327	24497579	NM_001628.2	AKR1B1	83.65924065	1.273311325	0.000719704
5900414	5031814	NM_005548.1	KARS	23.41578115	1.134554539	0.000730069
1340338	89041598	XM_377476.3	MGC57346	17.93153367	1.232438001	0.000733975
2850576	68160936	NM_005082.4	TRIM25	-23.69158863	-1.216917513	0.000737703
6960328	75677605	NM_001033515.1	LOC389833	5.635808116	1.113339339	0.000738593
20224	47894448	NM_206967.1	MGC17624	5.464481452	1.099129587	0.000741223
4560463	4290896	AI433683		-4.20815397	-1.088940654	0.000764668
6380148	15431305	NM_033301.1	RPL8	855.395502	1.170817986	0.000768045
5490142	50363239	NM_002685.2	EXOSC10	64.67454838	1.261126978	0.000769548
150632	48762708	NM_022136.3	SAMSN1	-80.93158519	-1.692010385	0.000781956
240653	19603939	BM981444		-2.329460443	-1.056632024	0.000785871
2750070	18375517	NM_001854.2	COL11A1	-3.554107591	-1.070221603	0.000788658
6020575	14249551	NM_032839.1	DIRC2	-35.91490208	-1.218965412	0.000797516
3710189	38201688	NM_002883.2	RANGAP1	65.259255	1.257018161	0.000797921
2710278	52851445	NM_005412.4	SHMT2	65.41415964	1.2526449	0.000800169
360343	17105402	NM_005103.3	FEZ1	12.70533853	1.203271429	0.00082364
4050398	47132594	NM_213611.1	SLC25A3	190.2461506	1.160808106	0.000837252
6940246	292820	M97723		20.54719112	1.328176844	0.000841772
2690576	55953121	NM_015705.4	RUTBC3	14.20156258	1.166207066	0.00084996
5130475	27477087	NM_003853.2	IL18RAP	-632.4410294	-1.712375333	0.000851483
2120681	13376061	NM_024740.1	ALG9	12.03252127	1.167495262	0.000852968
1690189	24234685	NM_153201.1	HSPA8	155.7459284	1.215840724	0.000855179
1410369	41350203	NM_016286.2	DCXR	36.20150781	1.200362836	0.000857671
4850438	39777595	NM_021809.4	TGIF2	16.93614892	1.169575173	0.000858382
7100392	16753208	NM_017481.2	UBQLN3	4.445833834	1.083359837	0.000865917
1340731	21361349	NM_006643.2	SDCCAG3	29.22941312	1.187927522	0.00086772
2450603	32967290	NM_181803.1	UBE2C	-13.65767785	-1.212875537	0.000875883
3390458	25777636	NM_002243.3	KCNJ15	-68.77822725	-1.313720856	0.000892396
1990673	52851448	NM_173659.2	RPUSD3	26.38750171	1.177225317	0.000894737
4150632	21618346	NM_002756.2	MAP2K3	3.058914147	1.065607186	0.000899878
130451	10835100	NM_021078.1	GCN5L2	45.23903059	1.24691539	0.000902329
10338	72534727	NM_001031717.1	CRELD1	22.42405663	1.23243055	0.000913686
1500040	30581134	NM_006306.2	SMC1L1	7.353409474	1.122782283	0.00092398
4590082	17999536	NM_006445.2	PRPF8	125.5348006	1.304518217	0.000927196
730725	40068037	NM_016524.2	SYT17	3.962856298	1.08382056	0.000932685
3800270	4757937	NM_000648.1	CCR2	-2.41229231	-1.064558526	0.000934322
5090204	7661547	NM_015702.1	C2orf25	-79.93887985	-1.186330813	0.000959059

3170468	7706726	NM_016089.1	ZNF589	28.88231896	1.256897786	0.000963048
50164	41281436	NM_014669.2	NUP93	28.51197413	1.174573985	0.000965886
4050411	34222200	NM_153329.2	ALDH16A1	53.51905541	1.260140642	0.000966212
380315	7705725	NM_015959.1	TXNDC14	36.56045278	1.18069957	0.000967375
6650541	70980545	NM_176880.4	TRA16	14.18996137	1.190005746	0.000987075
1440291	14589867	NM_001716.2	BLR1	4.157558649	1.091968062	0.00099509
4880373	27842881	BX096603		10.23388569	1.158997206	0.000998463
2120356	39888074	CK299581		2.430006552	1.065215654	0.001020522
160682	54112120	NM_012426.3	SF3B3	44.15684822	1.219213777	0.001029969
4280047	34577088	NM_183382.1	RNF13	-75.68323448	-1.333056792	0.001037306
3890095	58696421	NM_002304.1	LFNG	232.3486066	1.232868306	0.001042389
1740576	41281526	NM_014871.2	USP52	19.95561799	1.213504932	0.001055174
2480082	35493922	NM_006031.3	PCNT2	29.27063181	1.159621239	0.001070467
6110328	23111065	NM_003645.2	SLC27A2	-4.068829061	-1.082705412	0.001075869
6660056	13743863	BG217842		-33.02507288	-1.299191877	0.001076096
6420541	34535726	AK128384		87.13245532	1.405980431	0.001078556
6770348	19920316	NM_006825.2	CKAP4	-161.4085766	-1.338853259	0.001086179
1500717	73765543	NM_000314.3	PTEN	-65.04739132	-1.242293391	0.001088331
7330487	52485986	NM_002566.4	P2RY11	28.34353619	1.266107577	0.00109239
2510324	7253951	AW578902		-5.837784587	-1.099192756	0.001097496
2760110	31542241	NM_017917.2	C14orf10	-58.83249801	-1.224680424	0.001102809
2000551	10092611	NM_016326.2	CKLF	-325.605478	-1.247443016	0.001103698
3140142	32698741	NM_020925.1	CACHD1	-2.700091737	-1.067483702	0.001113125
6400563	14150188	NM_032369.1	MGC15619	27.91382697	1.187624618	0.001114572
7000768	63003900	NM_017773.2	LAX1	36.42003819	1.258339525	0.001121704
2030450	6912355	NM_012155.1	EML2	42.34533266	1.168946841	0.001122558
3930687	71061448	NM_024326.2	FBXL15	41.8339122	1.225791909	0.00112491
770452	89029874	XM_928878.1	LOC392364	3.076035108	1.070389607	0.001136035
4390615	19924152	NM_138557.1	TLR4	-47.03190471	-1.308636895	0.001140352
2190524	46370053	NM_019011.4	TRIAD3	24.07686324	1.177162245	0.001145386
6350360	50593531	NM_005176.4	ATP5G2	516.754743	1.243669891	0.00114794
460273	35493970	NM_003345.3	UBE2I	90.10026341	1.134131115	0.001168429
160240	21040370	NM_005804.2	DDX39	101.9627944	1.230286148	0.001187406
5360674	32455240	NM_178232.2	HAPLN3	17.16381664	1.244549462	0.001189577
4920577	76781490	NM_007047.3	BTN3A2	93.80802363	1.266607439	0.001191858
4760364	62912469	NM_001017403.1	LGR6	15.47756491	1.23125561	0.001208655
4150768	7661817	NM_014181.1	HSPC159	-19.17476534	-1.275963432	0.001216429
2970332	50593004	NM_006328.2	RBM14	73.69517521	1.214022777	0.001227948
360066	7019566	NM_013378.1	VPREB3	58.73278863	1.504196763	0.001230244
2370341	88982372	XM_932015.1	LOC643401	2.094536796	1.05887807	0.001232055
940754	7657332	NM_014358.1	CLEC4E	-29.11656126	-1.340773284	0.001242297
1090048	48976062	NM_153611.3	CYBASC3	49.70244398	1.217479345	0.001247126
5910343	88953692	XM_929793.1	LOC646836	6.392732823	1.113777423	0.001249592
2810674	88970691	XM_942926.1	LOC647649	2.321532121	1.054742893	0.001252869
3800253	89035372	XM_932678.1	LOC387841	189.24229	1.278629303	0.001252967
760487	47778936	NM_014164.4	FXD5	393.3630931	1.33904597	0.001262983
6350017	4505462	NM_003632.1	CNTNAP1	8.432099288	1.161986349	0.001272112
2000390	32130539	NM_012395.2	PFTK1	-11.44388985	-1.184448545	0.001272449
360402	12383073	NM_022830.1	RBM21	12.81737281	1.157133003	0.001289751
7650025	40806176	NM_004949.2	DSC2	-93.38175241	-1.555845859	0.001292334
6270364	77157783	NM_015044.3	GGA2	54.90600546	1.283424211	0.001302584
7510224	89037451	XM_929560.1	ACOT1	5.220050681	1.097059274	0.001314489
3850025	21536366	NM_139353.1	TAF1C	75.95063347	1.204746923	0.001320044
2640373	71040087	NM_000449.3	RFX5	40.58475673	1.195639991	0.001352801
1940543	62243651	NM_001013848.1	EXOC6	-35.01537314	-1.307903607	0.001357439
1820142	34147665	NM_006374.3	STK25	30.72099994	1.157095215	0.001358231
3400328	47078294	NM_000022.2	ADA	67.32199518	1.313091331	0.001361042
1470332	21450778	NM_145036.1	MGC33887	2.451633821	1.057340207	0.001380734
2070241	23397461	NM_153211.1	C18orf17	26.57907091	1.195520367	0.001380825
6200746	39725655	NM_032376.2	TMEM101	20.79524943	1.135857258	0.001392087
5130154	2115625	AA431917		2.687068685	1.060681089	0.001397186
7650605	13489098	NM_024681.1	KCTD17	42.15691645	1.219877312	0.001398325
3990296	9951925	NM_000717.2	CA4	-213.0886356	-1.441889054	0.001400277
990224	40538798	NM_020131.3	UBQLN4	44.15987403	1.241656798	0.001409781
6110142	21389554	NM_144666.1	DNHD1	10.18272952	1.176487041	0.001414669
520154	34527067	AK130294		21.74202891	1.237530114	0.001416293
2650164	57164941	NM_001008938.1	CKAP5	29.33938351	1.191276253	0.001417373
6370463	89047258	XM_925913.1	LOC653063	2.808209897	1.065349534	0.00141842
6020500	27477133	NM_024923.2	NUP210	37.64775789	1.196401091	0.001418525

3800243	5031976	NM_005746.1	PBEF1	-348.2606482	-1.392173496	0.001419039
7380328	11141876	NM_021805.1	SIGIRR	25.06501581	1.245654007	0.001427724
4200451	88983572	XM_068632.5	LOC133993	3.341967043	1.065344844	0.001430887
1430156	13129099	NM_024096.1	XTP3TPA	21.55693285	1.173886359	0.001430912
2490747	4501840	NM_001605.1	AARS	77.76894401	1.276356344	0.001432837
1010612	31542677	NM_031206.2	LAS1L	12.21303662	1.172490221	0.001437935
2630181	38570053	NM_020408.3	C6orf149	8.470600619	1.14906581	0.001455672
1450082	29789121	NM_021117.1	CRY2	17.52300597	1.161214169	0.001456531
3940020	38149169	CF887308		2.194774646	1.057872899	0.001465205
2970440	51592099	NM_014675.2	CROCC	5.396550969	1.094770922	0.001466061
3990192	6912279	NM_012111.1	AHSA1	28.18197892	1.15069417	0.001481716
3830278	12751496	NM_023080.1	C8orf33	11.18572632	1.129068947	0.001502437
650541	45935370	NM_002727.2	PRG1	-1496.501337	-1.289002142	0.00150564
2070131	22035596	NM_031420.2	MRPL9	31.85307452	1.167431606	0.001511617
6040259	31652258	NM_032853.2	MUM1	21.48103217	1.229453813	0.001518048
650014	37237779	CF619198		2.327816537	1.063259079	0.0015214
1690504	27831422	BX101820		2.143929406	1.056737612	0.00152161
5080056	39841072	NM_018079.3	FLJ10379	-24.26466131	-1.201359313	0.001525093
6220450	40548399	NM_005771.3	DHRS9	-181.3140503	-1.439115636	0.001532317
7100504	39652617	NM_004623.2	TTC4	36.08459854	1.184629696	0.001561337
2100221	40353209	NM_017758.2	ALKBH5	161.2343238	1.161468316	0.001576054
6280576	21614543	NM_002964.3	S100A8	-3148.764309	-1.349637782	0.001592006
5890273	21071040	NM_014141.3	CNTNAP2	6.595271148	1.146748332	0.001599007
4780672	68216098	NM_012413.3	QPCT	-224.4635907	-1.289467296	0.001600979
7610546	40255053	NM_032717.3	HMFN0839	-54.94911949	-1.280308621	0.001603755
6020132	41281777	NM_152943.1	ZNF268	2.648966818	1.059765454	0.001607376
6110133	15042936	NM_007365.1	PADI2	-9.370076681	-1.156334733	0.001614081
2000474	17965839	BM272556		-2.55867557	-1.067794085	0.001622817
1500328	27477086	NM_003855.2	IL18R1	-122.3006055	-1.893619161	0.001627845
2030747	34222148	NM_032138.3	KBTBD7	-29.27404586	-1.314648032	0.001628042
5560093	34531894	AK125708		3.295857766	1.075280337	0.001644271
610465	41393562	NM_015074.2	KIF1B	-69.35956203	-1.363720205	0.001645719
3400372	53692181	NM_015002.2	FBXO21	26.3299661	1.15897828	0.001663991
6580075	20149575	NM_006164.2	NFE2L2	-62.000525	-1.276555302	0.001666828
5130747	23238724	BU587445		5.206540958	1.107947177	0.001673048
650358	71773149	NM_000485.2	APRT	84.63692212	1.280817312	0.001674124
6650576	24787676	CA424950		2.962661443	1.070519384	0.001676488
5960128	21327699	NM_003487.2	TAF15	87.80187716	1.346679516	0.001679561
1190647	18375504	NM_080649.1	APEX1	89.44973593	1.233840385	0.001687003
2510133	4506782	NM_003864.1	SAP30	-78.20837572	-1.646698366	0.001706434
4120086	13569871	NM_030915.1	LBH	4.189390797	1.079490285	0.001706774
3130019	20143980	NM_014234.3	HSD17B8	21.75170555	1.196488957	0.001711828
4200148	42660194	XM_378421		14.16364107	1.189819518	0.001713891
940706	88989505	XM_939144.1	LOC650058	2.002405673	1.048229223	0.001739768
20553	42789728	NM_006152.2	LRMP	-74.82036091	-1.177440044	0.001740334
5550270	27838297	BX113537		3.941936997	1.086914048	0.00175354
4570612	51477715	NM_006122.2	MAN2A2	-44.39209005	-1.25693322	0.001768914
770458	70995210	NM_001398.2	ECH1	140.6533489	1.216657159	0.001780796
3390008	24475884	NM_003475.2	RASSF7	57.42044838	1.233262979	0.001787024
2970768	4503528	NM_001416.1	EIF4A1	408.0155473	1.170835965	0.001793442
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1240440	48762680	NM_000701.6	ATP1A1	37.53285116	1.204524584	0.001815625
2320309	89037018	XM_941325.1	LOC652025	117.8979784	1.237697761	0.001829317
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6380358	73912719	NM_001032363.1	C1orf151	3.003480865	1.065127964	0.001856986
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6110672	68303646	NM_001025077.1	CUGBP2	-49.70921613	-1.21027928	0.001902574
7050196	88988812	XM_943393.1	LOC647784	2.371716902	1.058914165	0.001918129
6420079	89027874	XM_291277.4	KFZp761P0423	80.22901015	1.337704578	0.001921658
1070377	66346718	NM_207106.2	UIP1	32.34029956	1.192004187	0.0019244
7380170	28178815	NM_174855.1	IDH3B	104.9723088	1.205100893	0.001927203
50347	57862814	NR_002196.1	H19	4.098623993	1.09014366	0.001939512
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5130142	50301239	NM_001001998.1	EXOSC10	23.91241934	1.189832508	0.001984951

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3940386	39995110	NM_000849.3	GSTM3	8.079852703	1.155645076	0.002004006
4590646	67089144	NM_001024667.1	FCRL3	94.2507356	1.380488839	0.002010981
2100519	54144638	NM_006469.4	IVNS1ABP	-63.08035217	-1.228618943	0.002018303
2710711	23200005	NM_149379.1	NSUN5C	34.34062961	1.320832601	0.002020028
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2680682	47157327	NM_213636.1	PDLIM7	-106.9173695	-1.290786624	0.002138706
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3610634	41327713	NM_020531.2	C20orf3	-169.2466369	-1.311482228	0.002151473
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5050653	24432071	NM_145032.2	FBXL13	-18.83916692	-1.233611781	0.002971531
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6280168	21450799	NM_145043.1	NEIL2	19.88048242	1.19544672	0.002995077
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GO Term	expected number of genes	observed number of genes	FDG corrected p-value
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GO:0044446	96.7321	136	0.000764699
GO:0044422	98.1058	137	0.000839772
GO:0001882	32.0186	57	0.00130518
GO:0001883	31.8284	57	0.00130518
GO:0005488	237.614	272	0.00130518
GO:0005622	216.036	252	0.00130518
GO:0008150	274.536	302	0.00130518
GO:0034404	5.98103	19	0.00130518
GO:0034654	5.98103	19	0.00130518
GO:0043233	36.8795	63	0.00130518
GO:0044237	142.974	182	0.00130518
GO:0044271	9.36253	25	0.00130518
GO:0044281	32.9908	58	0.00130518
GO:0044444	100.896	137	0.00130518
GO:0070013	36.1187	62	0.00130518
GO:0009152	2.30365	11	0.00152387
GO:0030554	31.1098	55	0.00152387
GO:0032559	29.5459	53	0.00152387
GO:0043226	179.008	216	0.00152387
GO:0043229	178.712	216	0.00152387
GO:0005515	160.199	197	0.00171422
GO:0005524	29.0809	52	0.00171422
GO:0009165	5.83309	18	0.00171422
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GO:0008152	160.917	197	0.00216767
GO:0032395	0.211344	4	0.00216767
GO:0009260	2.49386	11	0.00223749
GO:0044283	11.6873	27	0.00261399
GO:0006164	5.07225	16	0.00268302
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GO:0009987	224.997	257	0.00292
GO:0006753	10.6095	25	0.00316455
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GO:0009127	0.33815	4	0.0102654
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GO:0006139	81.938	106	0.0340685
GO:0002700	0.86651	5	0.0356179
GO:0044419	6.91094	16	0.0356179
GO:0044267	48.1019	68	0.03578
GO:0005576	38.3166	22	0.0361249
GO:0030890	0.52836	4	0.0361249
GO:0050778	3.29696	10	0.0366242
GO:0009116	1.31033	6	0.0391608
GO:0006163	8.39035	18	0.0406692
GO:0002376	21.7895	36	0.0407465
GO:0016810	2.28251	8	0.0407465
GO:0006952	14.1389	26	0.0410616
GO:0006807	90.1381	114	0.0411878
GO:0006955	14.1812	26	0.0418519
GO:0005643	1.3526	6	0.0426764
GO:0009161	0.570628	4	0.0433781
GO:0002460	2.36705	8	0.0436123
GO:0002701	0.0845375	2	0.0436123
GO:0002719	0.0845375	2	0.0436123
GO:0005623	284.744	302	0.0436123
GO:0006152	0.0845375	2	0.0436123
GO:0032906	0.0845375	2	0.0436123
GO:0032909	0.0845375	2	0.0436123
GO:0044464	284.722	302	0.0436123
GO:0046085	0.0845375	2	0.0436123
GO:0046130	0.0845375	2	0.0436123

GO:0005765	1.88096	7	0.0459702
GO:0002250	2.40932	8	0.0467596
GO:0050657	1.90209	7	0.0467596
GO:0050658	1.90209	7	0.0467596
GO:0051236	1.90209	7	0.0467596
GO:0070228	0.295881	3	0.0467596
GO:0005783	19.8875	33	0.046807