SUPPLEMENTARY MATERIAL

RPL5 on 1p22 is recurrently deleted in multiple myeloma and its expression is linked to bortezomib response

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Supplementary Methods

Fluorescent in situ hybridization (FISH)

FISH was performed according to standard procedures. All UZ Leuven cases are routinely characterized by FISH, as described previously.[1] In addition, the *RPL5* locus was examined with two bacterial artificial chromosome (BAC) clones covering and flanking the gene, RP11-1E09 and RP11-456E23, selected from www.ensembl.org. The clones were directly labeled with Spectrum Orange- or Spectrum Green-deoxyuridine triphosphate (dUTP) (Abbott Molecular) using random priming. Up to 100 plasma cells were evaluated in each experiment. FISH images were acquired with a fluorescence microscope equipped with an Axiophot 2 camera (Carl Zeiss Microscopy) and a MetaSystems ISIS imaging system (MetaSystems).

Analysis of mutation load of 1p22.1 genes

This analysis was done on the MMRC sequence dataset of 203 patients.[2] A mutation score was assigned to each 1p22.1 gene by multiplying the gene length corrected mutation count by a score measuring functional impact of the mutations. This functional score was calculated using TRansFIC.[3] Mutations with low, median and high impact as predicted by TRansFIC were given a weight of 0.25, 0.5 and 1 respectively, and scores calculated by the siftTRansFIC and pp2TRansFIC algorithms were averaged. Finally, scores for the different mutations in a gene were averaged to obtain the final functional impact score (Supplementary tables 4+5).

Multiplex ligation-dependent probe amplification (MLPA) assay

The SALSA MLPA P212 DBA probemix (MRC-Holland) was used. Probes targeting *RPL5* are indicated in Figure 1E.

Optimal cutoff analysis

ROC analysis for bortezomib response based on *RPL5* expression was run using GraphPad Prism. Optimal cutoff was determined by calculating Youden's J-statistic (Supplementary figure 4). Optimal cutoff for survival curves was determined using the online tool Cutoff Finder[4] (Supplementary figure 3).

Supplementary References

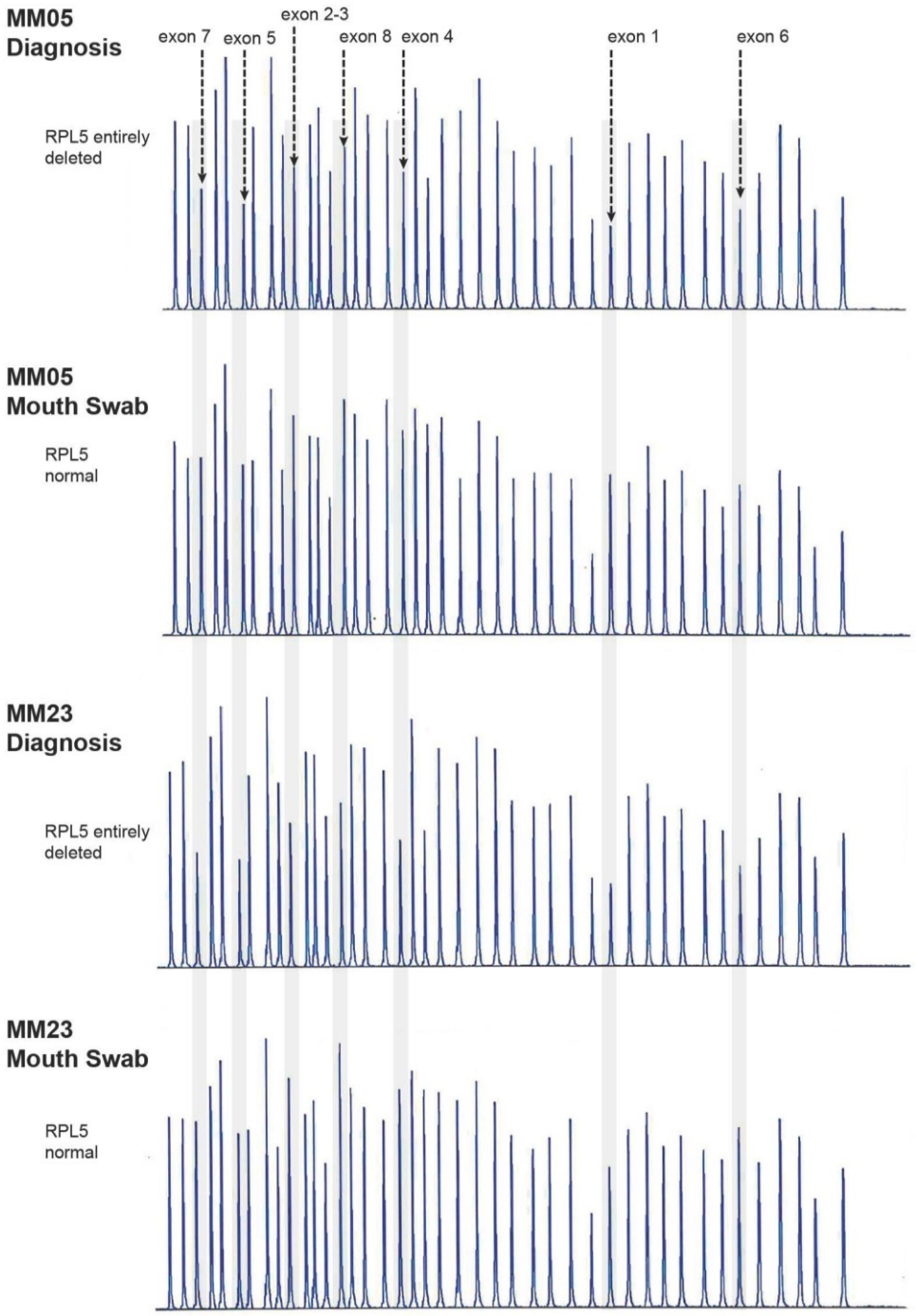
1.Put N, Lemmens H, Wlodarska I, et al. Interphase fluorescence in situ hybridization on selected plasma cells is superior in the detection of cytogenetic aberrations in plasma cell dyscrasia. *Genes Chromosomes Cancer*. 2010;49(11):991-7-997.

2. Lohr JG, Stojanov P, Carter SL, et al. Widespread Genetic Heterogeneity in Multiple Myeloma: Implications for Targeted Therapy. *Cancer Cell*. 2014;25(1):91-101

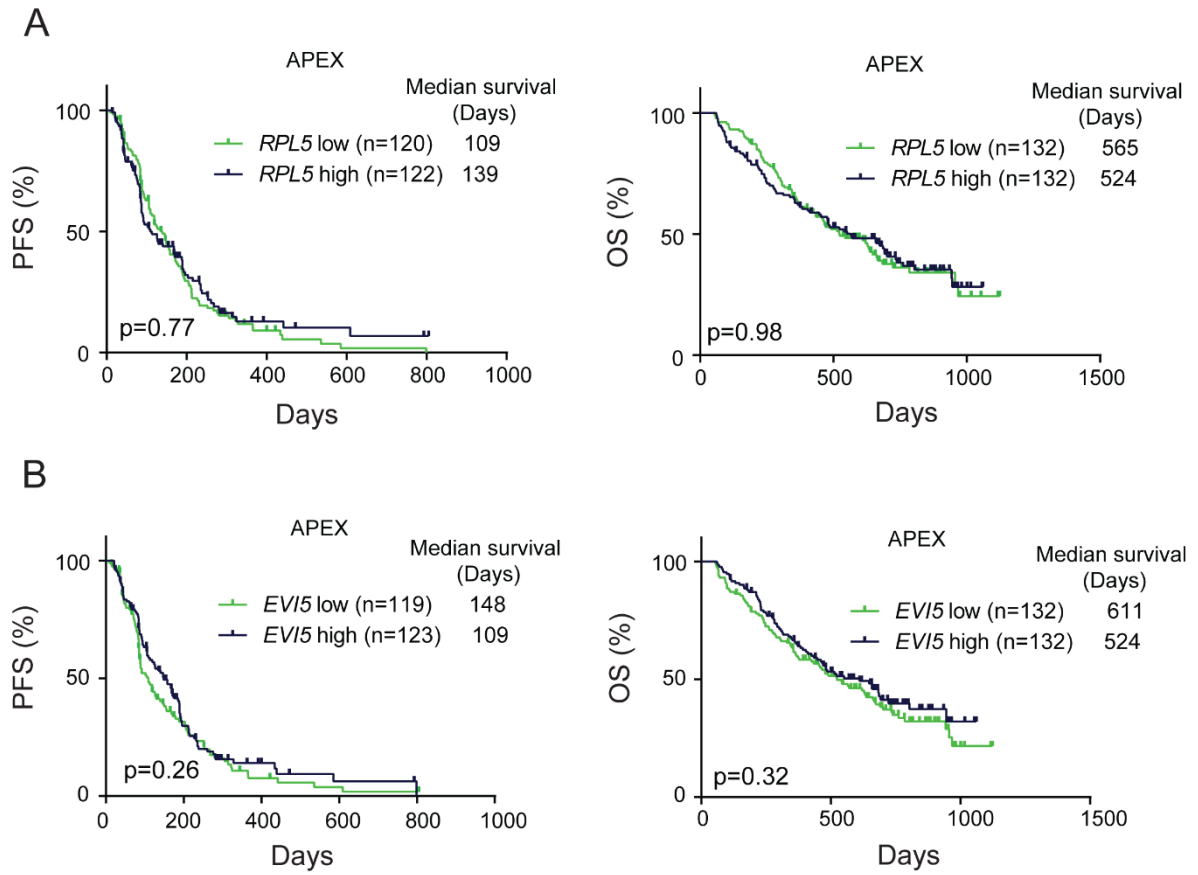
3. Gonzalez-Perez A, Deu-Pons J, Lopez-Bigas N. Improving the prediction of the functional impact of cancer mutations by baseline tolerance transformation. *Genome Med.* 2012.

4. Budczies J, Klauschen F, Sinn BV, Gyoerffy B, Schmitt WD, Darb-Esfahani S et al. Cutoff Finder: A Comprehensive and Straightforward Web Application Enabling Rapid Biomarker Cutoff Optimization. *PloS one* 2012; 7: e51862.

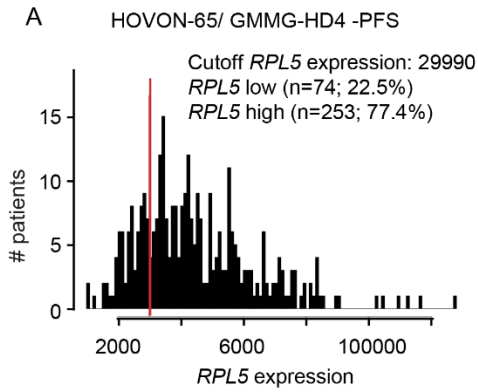
Supplementary Figures

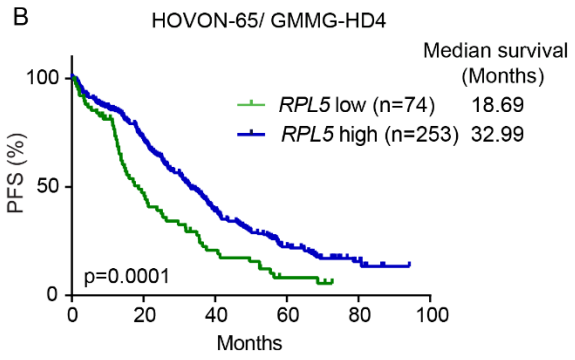


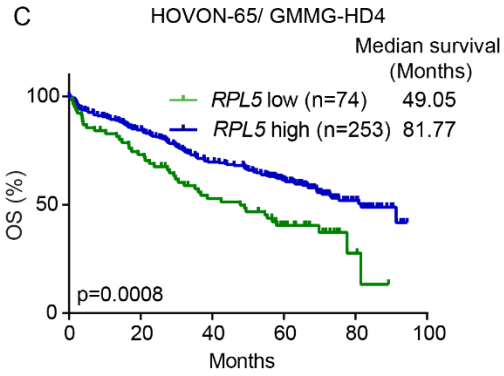
Supplementary Figure 1. Confirmation of somatic status of the deletions by MLPA assay. MLPA was performed on paired diagnostic and mouth swab samples of two patients that showed deletions on the copy number arrays (MM05 and MM23). In both cases, the deletion was confirmed to be somatic.

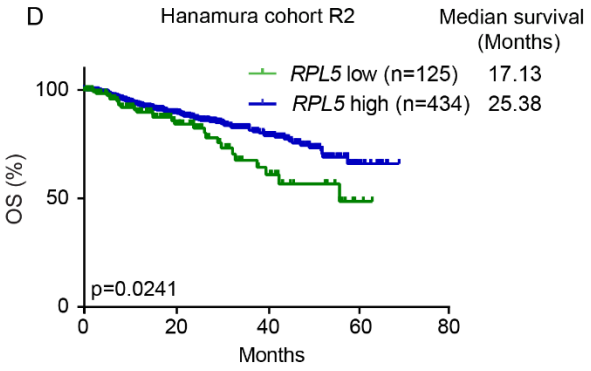


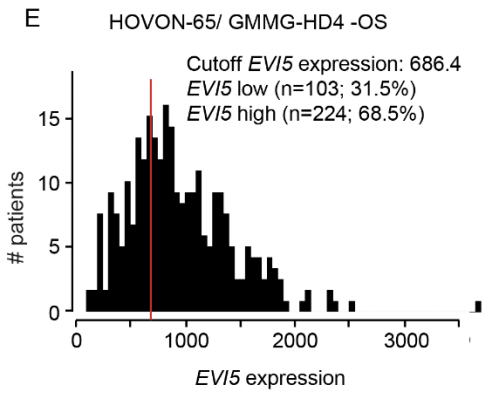
Supplementary Figure 2. Low *EVI5* and *RPL5* expression does not correlate with shorter PFS and OS in relapse patients.
(A) Kaplan-Meier curves comparing PFS (left) and OS (right) of *RPL5* low and high expressing cases in the APEX trial. (B) PFS and OS of *EVI5* low and high expressing cases in the APEX trial. Low and high expression are defined here as below and above median. P-values were calculated with Log-rank tests.

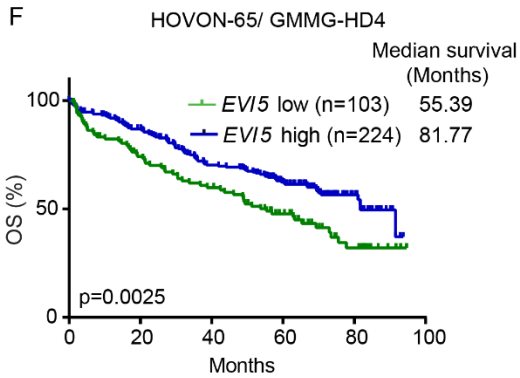

A
HOVON-65/ GMMG-HD4 -PFS
Cutoff RPL5 expression: 29990
RPL5 low (n=74; 22.5%)
RPL5 high (n=253; 77.4%)
patients
RPL5 expression

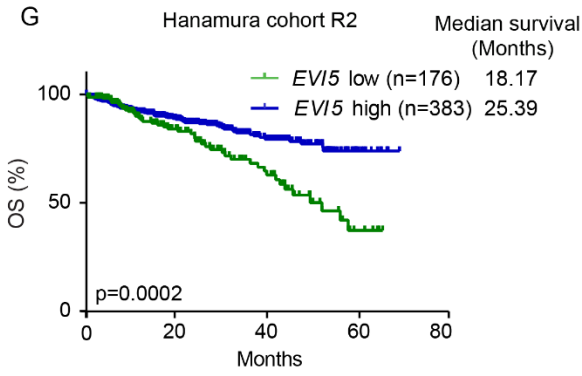

B
HOVON-65/ GMMG-HD4
Median survival (Months)
RPL5 low (n=74) 18.69
RPL5 high (n=253) 32.99
PFS (%)
p=0.0001
Months


C
HOVON-65/ GMMG-HD4
Median survival (Months)
RPL5 low (n=74) 49.05
RPL5 high (n=253) 81.77
OS (%)
p=0.0008
Months


D
Hanamura cohort R2
Median survival (Months)
RPL5 low (n=125) 17.13
RPL5 high (n=434) 25.38
OS (%)
p=0.0241
Months

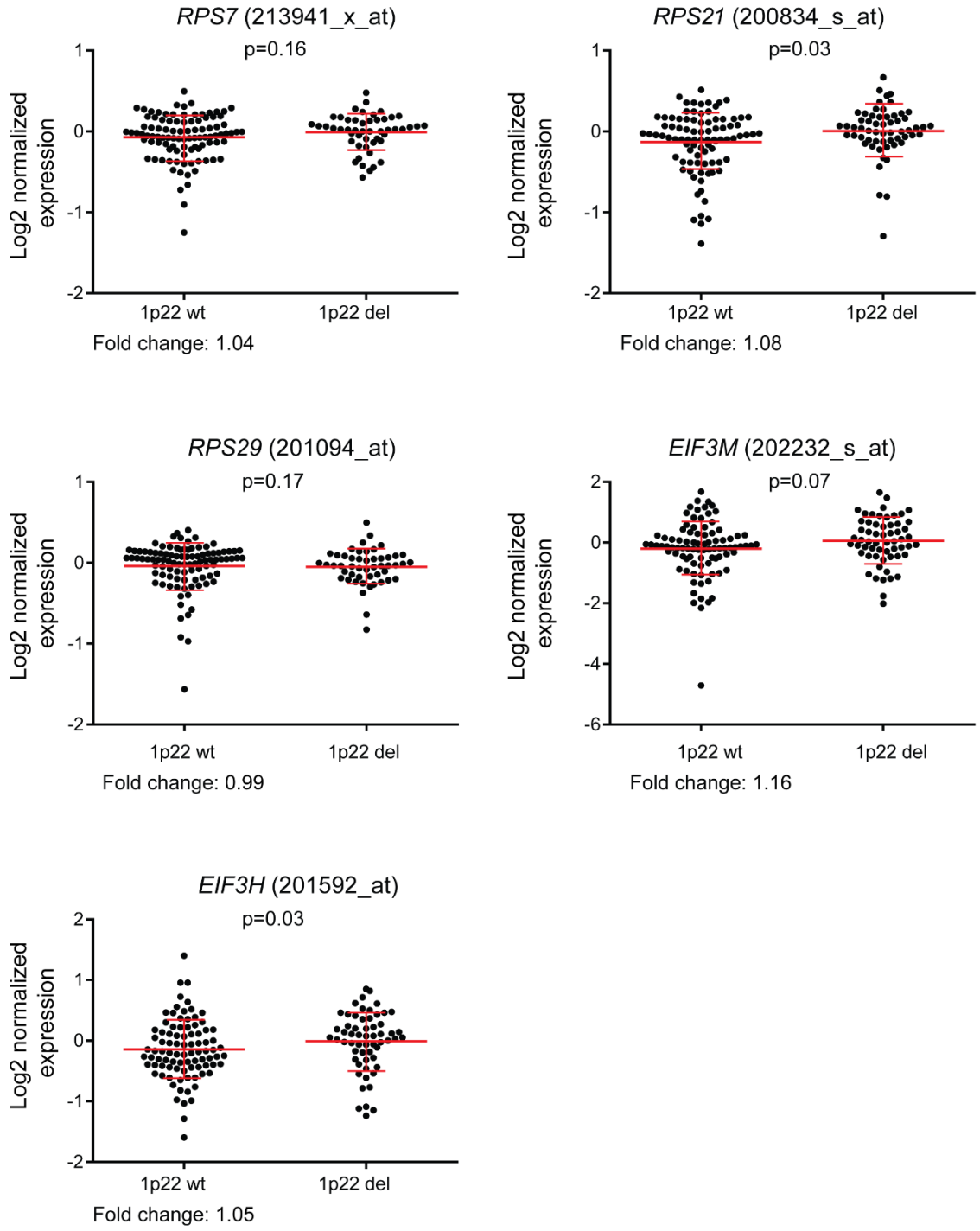

E
HOVON-65/ GMMG-HD4 -OS
Cutoff EVI5 expression: 686.4
EVI5 low (n=103; 31.5%)
EVI5 high (n=224; 68.5%)
patients
EVI5 expression


F
HOVON-65/ GMMG-HD4
Median survival (Months)
EVI5 low (n=103) 55.39
EVI5 high (n=224) 81.77
OS (%)
p=0.0025
Months

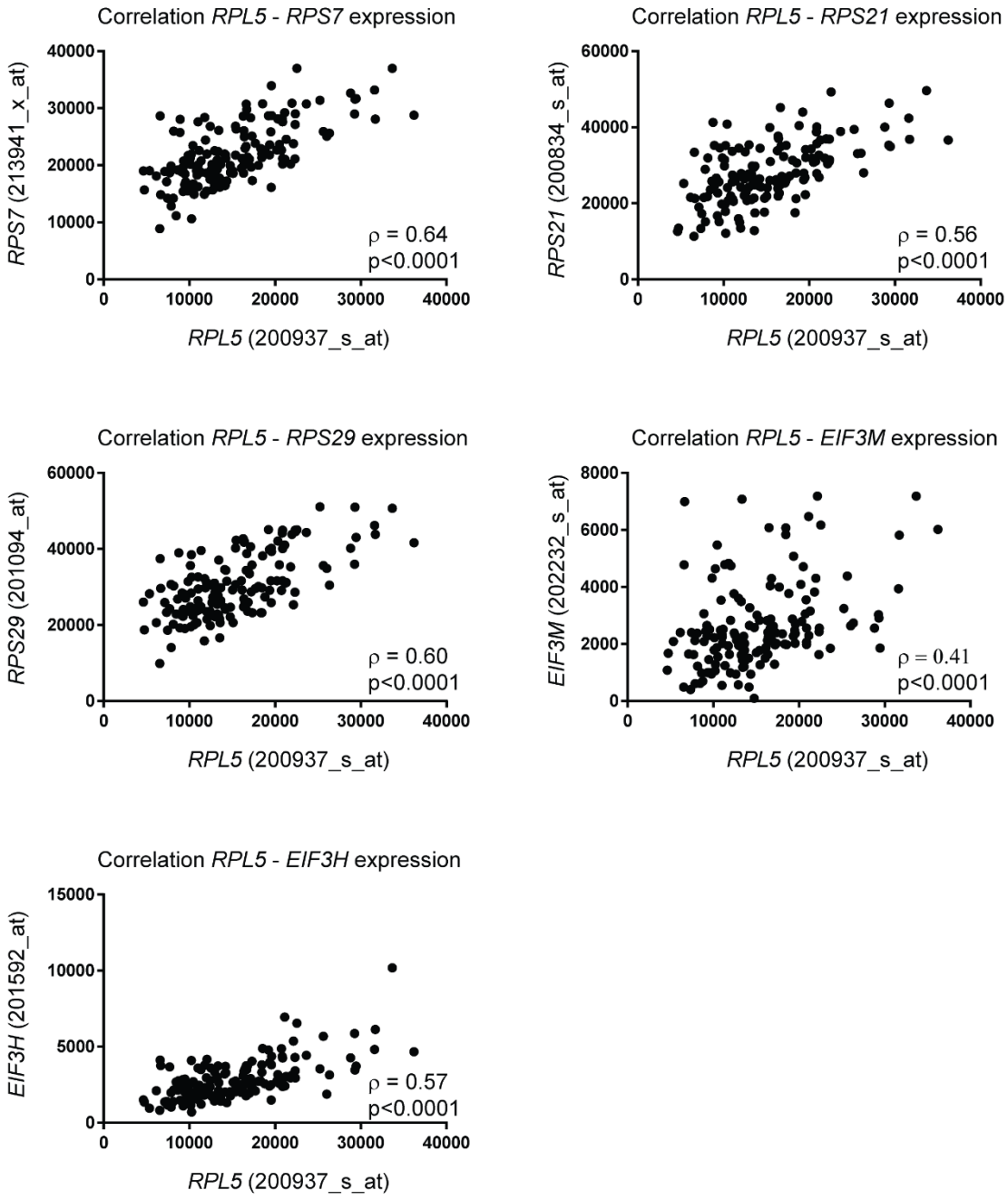

G
Hanamura cohort R2
Median survival (Months)
EVI5 low (n=176) 18.17
EVI5 high (n=383) 25.39
OS (%)
p=0.0002
Months

Supplementary Figure 3. Kaplan-Meier curves for survival stratified by the optimal expression threshold of *RPL5* or *EVI5.*

(A) Threshold analysis using the Cutoff Finder tool to determine the optimal *RPL5* expression cutoff for survival. Shown here is the optimal RPL5 expression threshold for PFS in the HOVON-65 trial which is determined at the 22.5% lowest RPL5 expressers. (B and C) Kaplan-Meier curves based on optimal cutoff of *RPL5* expression for PFS (B) and OS (C) in the HOVON-65 trial. (D) Validation of the RPL5 expression cutoff of 22.5% lowest expressers on the OS data from the Hanamura cohort available in the R2: Genomics Analysis and Visualization Platform confirms statistical significant separation of OS. (E) Optimal cutoff analysis using Cutoff Finder determines the optimal EVI5 expression cutoff for OS in the HOVON-65 trial at the 31.5% lowest EVI5 expressers. (F and G) Kaplan-Meier curves based on optimal cutoff of *EVI5* expression in the HOVON-65 trial (F) and validation in the Hanamura cohort (G). P-values were calculated using Log-rank tests.



Supplementary Figure 4. Expression levels of other ribosomal protein and translation genes besides *RPL5* in 1p22 deleted versus non-deleted cases.
Gene expression plots of the indicated genes in 1p22 wt versus deleted cases. The red horizontal lines indicate the average value and standard deviation in the group. P-values were calculated using a 2-tailed Mann-Whitney test. Fold changes in expression between 1p22 wt and deleted cases are reported below each of the plots. Data come from the MMRC cohort.



Supplementary Figure 5. Correlation between expression levels of *RPL5* and other ribosomal protein and translation genes.
Dot plots representing GCRMA normalized expression values for the indicated probesets. Correlation was assessed by calculating r and p-values using the Spearman method. Data come from the MMRC cohort. Standard deviations: *RPS7* (5320); *RPL5* (6210); *RPS21* (7903); *RPS29* (8279); *EIF3M* (1527); *EIF3H* (1334).

A

Survival

HOVON65	PFS				OS			
	exp(B)	95% CI	p-value	FDR	exp(B)	95% CI	p-value	FDR
RPS21	0.812	0.71 - 0.94	0.004	**0.012**	0.834	0.70 - 1.00	0.046	0.081
RPL5	0.805	0.70 - 0.93	0.003	**0.012**	0.775	0.65 - 0.93	0.006	**0.036**
RPS29	0.865	0.76 - 0.99	0.036	0.054	0.843	0.71 - 1.01	0.060	0.081
EIF3H	0.93	0.81 - 1.06	0.282	0.322	0.856	0.72 - 1.02	0.081	0.081
EIF3M	0.936	0.82 - 1.07	0.322	0.322	0.851	0.71 - 1.02	0.079	0.081
RPS7	0.849	0.74 - 0.97	0.02	**0.04**	0.813	0.68 - 0.98	0.027	0.081

APEX	PFS				OS			
	exp(B)	95% CI	p-value	FDR	exp(B)	95% CI	p-value	FDR
RPS21	---*	---	---	---	---*	---	---	---
RPL5	0.986	0.85 - 1.14	0.848	NA	1.033	0.89 - 1.21	0.677	NA
RPS29	---*	---	---	---	---*	---	---	---
EIF3H	1.057	0.91 - 1.24	0.48	NA	1.191	1.02 - 1.39	0.028	NA
EIF3M	1.112	0.96 - 1.28	0.146	NA	1.150	0.99 - 1.33	0.062	NA
RPS7	1.032	0.89 - 1.20	0.672	NA	0.981	0.84 - 1.15	0.809	NA

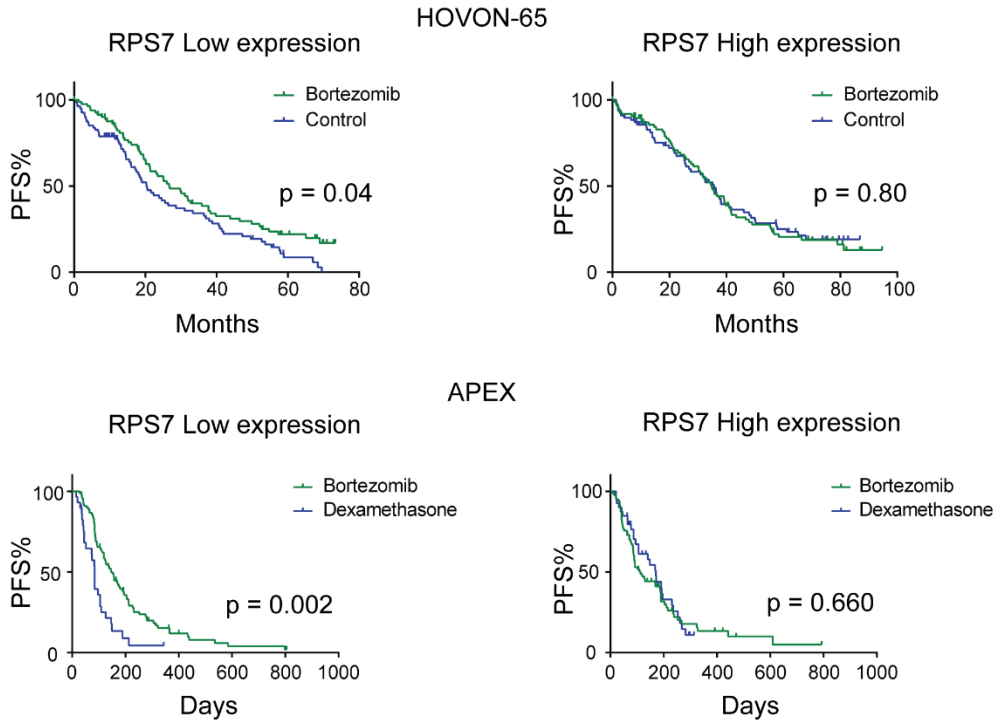
B

Bortezomib PFS

HOVON65	Low expression				High expression			
	exp(B)	95% CI	p-value	FDR	exp(B)	95% CI	p-value	FDR
RPS21	0.60	0.39 - 0.93	0.02	**0.04**	1.00	0.60 - 1.53	0.9	NA
RPL5	0.67	0.47 - 0.96	0.03	**0.045**	1.00	0.69 - 1.41	0.9	NA
RPS29	0.75	0.53 - 1.07	0.12	0.12	0.93	0.64 - 1.34	0.7	NA
EIF3H	0.72	0.50 - 1.03	0.07	0.08	0.93	0.65 - 1.33	0.7	NA
EIF3M	0.65	0.45 - 0.93	0.02	**0.04**	0.98	0.68 - 1.40	0.9	NA
RPS7	0.67	0.47 - 0.95	0.02	**0.04**	1.00	0.72 - 1.51	0.8	NA

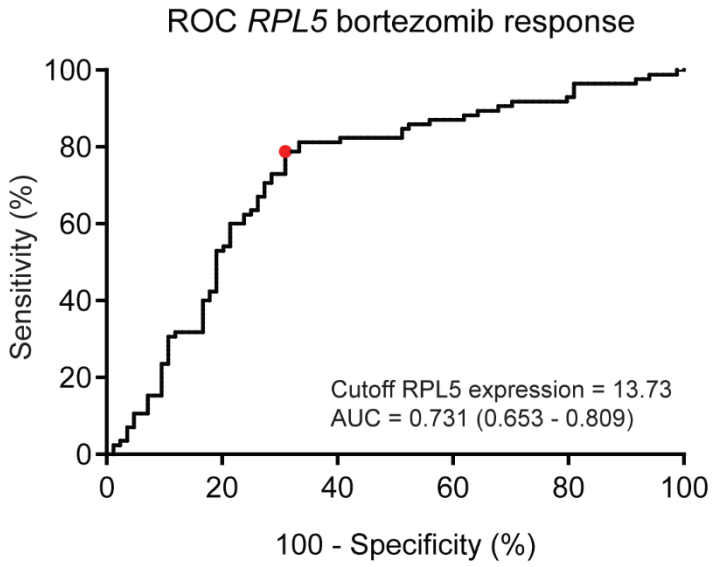
APEX	Low expression				High expression			
	exp(B)	95% CI	p-value	FDR	exp(B)	95% CI	p-value	FDR
RPS21	0.63	0.40 - 0.99	0.05	0.07	0.91	0.57 - 1.44	0.7	NA
RPL5	0.58	0.38 - 0.91	0.02	**0.03**	0.93	0.58 - 1.49	0.8	NA
RPS29	0.56	0.36 - 0.87	0.01	**0.03**	0.96	0.60 - 1.53	0.9	NA
EIF3H	0.79	0.51 - 1.23	0.3	0.3	0.71	0.45 - 1.13	0.2	NA
EIF3M	0.69	0.44 - 1.07	0.1	0.12	0.81	0.51 - 1.28	0.4	NA
RPS7	0.43	0.27 - 0.68	0.0003	**0.002**	1.11	0.70 - 1.75	0.7	NA

C

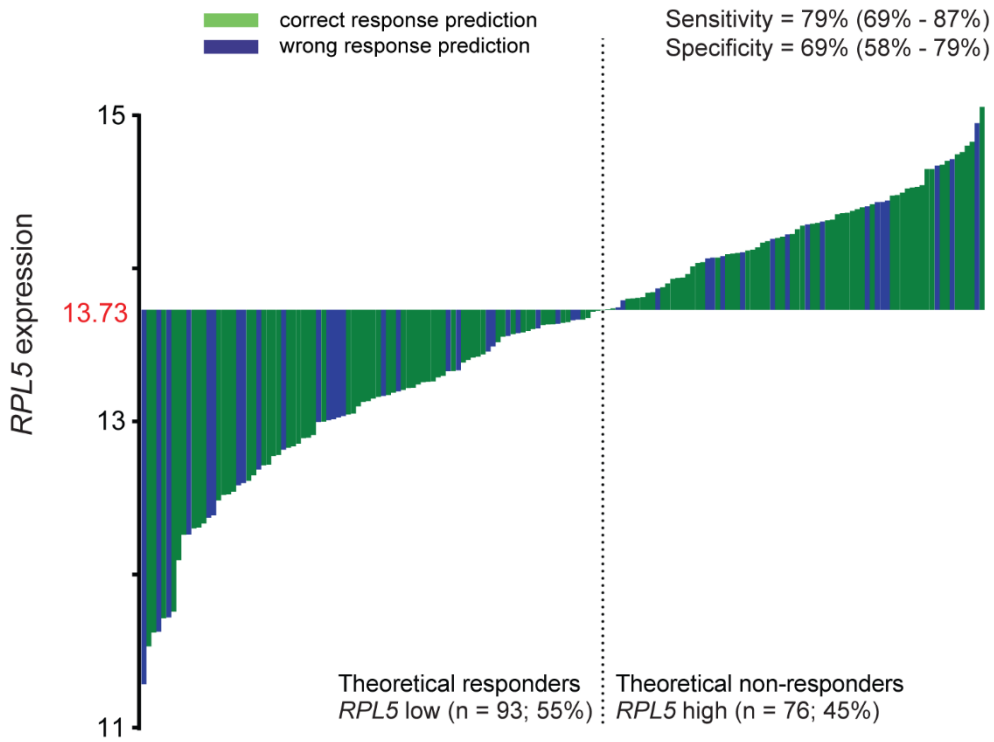


Supplementary Figure 6. The ribosome and other translational components are downregulated in patients responding to bortezomib.
(A) COX regression analysis on top ribosome/translation genes in the GSEA list of differentially expressed genes between bortezomib responders and non-responders revealed that only *RPL5* expression is correlated with significantly different PFS and OS in the HOVON-65 trial. No significant differences on survival are found in the APEX trial. The proportional hazard assumption was assessed by computing the time dependent covariate in SPSS. In the analyses marked with an asterisk, the proportional hazard assumption was not met, and therefore the results of the Cox model are not given. (B) COX regression analysis showing that *RPS7* was the only other ribosome/ translation gene besides *RPL5* for which low expression correlated with bortezomib benefit on PFS in both the HOVON-65 and APEX trial. The proportional hazard assumption was met for all analyses. (C) Kaplan-Meier curves for PFS of patients with low or high expression of RPS7 showing that, similar as for RPL5, patients with low expression do better on bortezomib treatment while patients with high expression fail to benefit from the treatment. Low and high expression are defined here as below and above median.

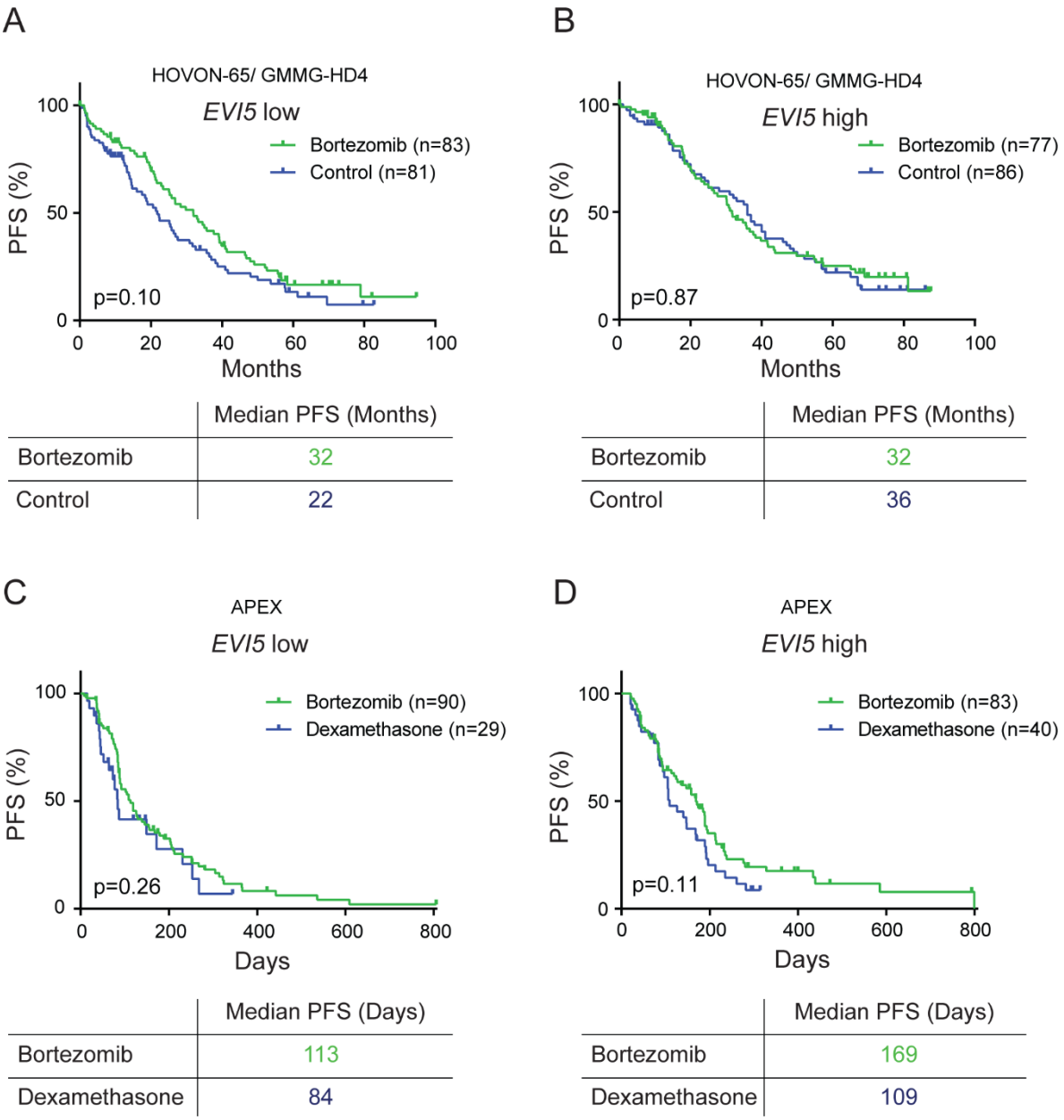
A



B



Supplementary figure 7. Optimal cutoff analysis to determine best threshold of *RPL5* expression to predict response to bortezomib treatment.
(A) ROC analysis determines the optimal cutoff for *RPL5* expression to predict bortezomib response at 13.73 in the APEX trial. (B) Waterfall plot showing prediction of bortezomib response applying the cutoff value determined in (A). Using this threshold, bortezomib response in the APEX cohort was predicted with a sensitivity of 79% and a specificity of 69%



	Median PFS (Months)
Bortezomib	32
Control	22

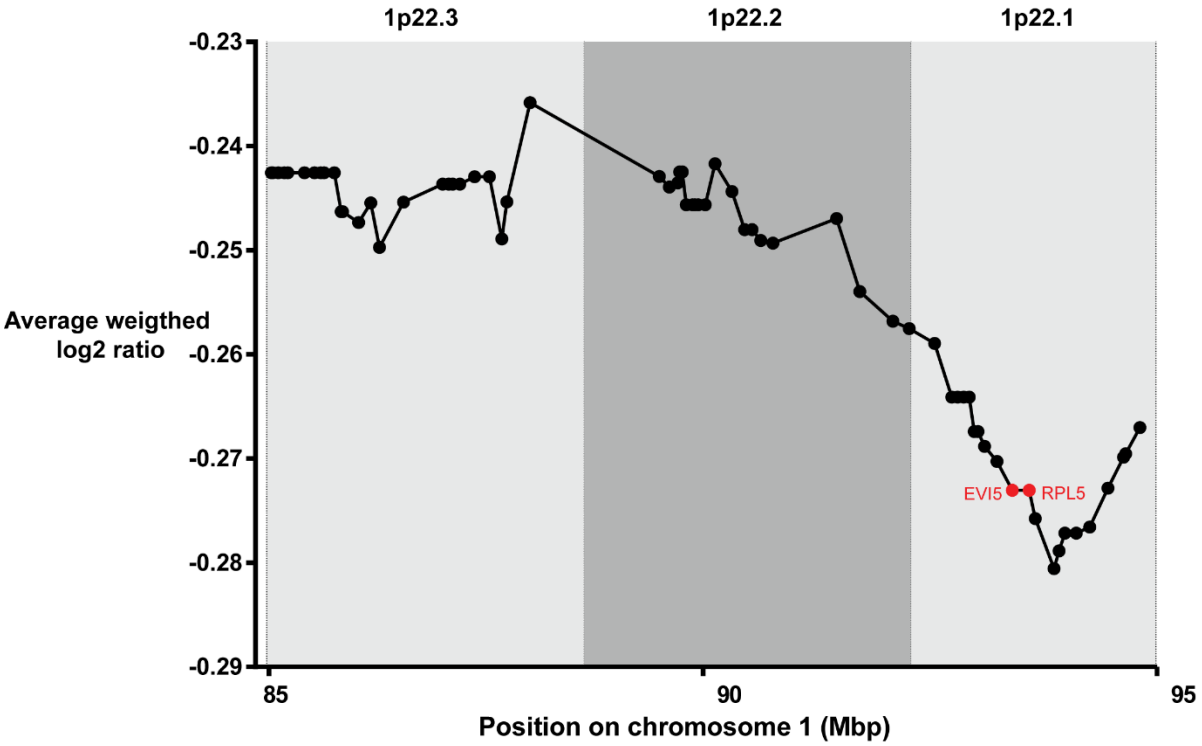
	Median PFS (Months)
Bortezomib	32
Control	36

	Median PFS (Days)
Bortezomib	113
Dexamethasone	84

	Median PFS (Days)
Bortezomib	169
Dexamethasone	109

Supplementary Figure 8. *EVI5* expression is not significantly linked to the benefit of bortezomib on PFS

(A-B) Kaplan-Meier curves comparing PFS of *EVI5* low (A) and high (B) expressing patients for bortezomib versus non-bortezomib arms in the HOVON-65/ GMMG-HD4 trial. (C-D) Kaplan-Meier curves comparing PFS of *EVI5* low (C) and high (D) expressing patients for bortezomib versus dexamethasone arms in the APEX trial. Low and high expression are defined here as below and above median. All p-values were calculated with Log-rank tests.



Supplementary Figure 9. Average weighted log2 array ratio of 1p22 genes in MMRC cohort. Each dot represents a gene on 1p22. Chromosomal location is indicated on the x-axis while the y-axis shows the average weighted log2 ratio, calculated as the average of all weighted log2 ratios of all patients in the public MMRC cohort.

Supplementary Tables

Supplementary table 1. Genetic characteristics of the UZ Leuven patient cohort

Supplementary table 2. 1p22 deletions in UZ Leuven cohort

Supplementary table 3. Calculation of average weighted log2 ratio of 1p22 genes in UZ Leuven cohort

Supplementary table 4. Calculation of mutation score of 1p22.1 genes in MMRC cohort

Supplementary table 5. Calculation of TRansFIC functional impact score of 1p22.1 mutated genes in MMRC cohort

Supplementary table 6. Probes differentially expressed between bortezomib responders and non-responders in the bortezomib arm of the APEX clinical trial

Supplementary table 7. KEGG gene sets significantly downregulated in bortezomib responders versus non-responders.

Supplementary table 8. Positional gene sets significantly downregulated in bortezomib responders versus non-responders.

Supplementary table 1. Genetic characteristics of the UZ Leuven patient cohort

Case	Relevant chromosomal aberrations found by FISH	1p22 loss by aCGH	1p22 loss by FISH
MM01	t(11;14)/IGH-CCND1; del(17p13)/TP53	yes	yes
MM02	del(14q); del(13q14)/RB1	yes	yes
MM03	t(11;14)/IGH-CCND1	no	ND
MM05	t(11;14)/IGH-CCND1; del(13q14)/RB1; del(17p13)/TP53	yes	yes
MM07	gain 1q21; del(13q14)/RB1; HD	yes	yes
MM08	del(13q14)/RB1; del(17p13)/TP53; HD	no	ND
MM09	t(11;14)/IGH-CCND1	no	ND
MM10	t(11;14)/IGH-CCND1	no	ND
MM11	HD	no	ND
MM12	del(13q14)/RB1; HD	yes	yes
MM13	t(11;14)/IGH-CCND1	no	ND
MM14	del(13q14)/RB1; HD	no	ND
MM15	gain 1q21; non IGH-t(8q24/MYC)	yes	ND
MM16	del(13q14)/RB1; t(14;20)/IGH-MAFB; del(17p13)/TP53	yes	yes
MM17	HD	no	ND
MM18	t(6;14)/IGH-CCND3	no	ND
MM19	HD	no	ND
MM20	t(11;14)/IGH-CCND1	no	ND
MM21	non IGH-t(8q24/MYC); del(13q14)/RB1; del(17p13)/TP53	yes	yes
MM22	unknown t(14q32/IGH)	no	ND
MM23	gain 1q21; del(13q14)/RB1; t(14;16)/IGH-CMAF	yes	yes
MM24	HD	no	ND
MM26	gain 1q21; del(13q14)/RB1; t(14;16)/IGH-CMAF	yes	yes
MM27	del(13q14)/RB1; HD	yes	yes
MM28	HD	yes	ND
MM29	gain 1q21; t(4;14)/IGH-FGFR3; non IGH-t(8q24/MYC); del(13q14)/RB1	no	ND
MM30	del(13q14)/RB1; HD	no	ND
MM31	non IGH-t(8q24/MYC); t(11;14)/IGH-CCND1	no	ND
MM32	t(11;14)/IGH-CCND1	no	ND
MM33	HD	no	ND
MM34	HD	yes	ND
MM35	HD	no	ND
MM36	del(13q14)/RB1; HD	yes	yes
MM37	non IGH-t(8q24/MYC); HD	yes	ND
MM38	gain 1q21; t(11;14)/IGH-CCND1; del(13q14)/RB1	no	ND

abbreviations: FISH, fluorescence in situ hybridization; HD, hyperdiploidy; ND, not determined

Supplementary table 2. 1p22 deletions in UZ Leuven cohort

Patient	Chr	Start (bp) hg19	End (bp) hg19	Size (bp)	Weighted log2 ratio
MM01	1	91237660	98040690	6803030	-0.50
MM02	1	92937414	93303113	365699	-0.30
MM05	1	93245520	93549070	303550	-0.60
MM07	1	90061250	93531180	3469930	-0.40
MM12	1	50098180	108935200	58837020	-0.25
MM15	1	46964300	103142700	56178400	-0.15
MM16	1	80333100	119260200	38927100	-0.25
MM21	1	89212340	93651540	4439200	-0.15
MM23	1	84348430	118610600	34262170	-0.40
MM26	1	88055730	118207300	30151570	-0.25
MM27	1	92705820	99739050	7033230	-0.15
MM28	1	36670000	120523042	83853042	-0.20
MM34	1	68577240	157447200	88869960	-0.20
MM36	1	88411940	99879270	11467330	-0.30
MM37	1	0	249250600	249250600	-0.15

Supplementary table 3. Calculation of average weighted log2 ratio of 1p22 genes in UZ Leuven cohort

			Weighted log2 array value																																				
Gene Name	Ensembl Gene ID	Location	MM01	MM02	MM03	MM05	MM07	MM08	MM09	MM10	MM11	MM12	MM13	MM14	MM15	MM16	MM17	MM18	MM19	MM20	MM21	MM22	MM23	MM24	MM26	MM27	MM28	MM29	MM30	MM31	MM32	MM33	MM34	MM35	MM36	MM37	MM38	Average weighted log2 value
RPF1	ENSG00000117133	1p22.3	0	0	0	0	0	0	0	0	0	-0.25	0	0	-0.15	-0.25	0	0	0	0	0	0	-0.4	0	0	0	-0.2	0	0	0	0	0	-0.2	0	0	-0.15	0	**-0.044**
GNG5	ENSG00000174021	1p22.3	0	0	0	0	0	0	0	0	0	-0.25	0	0	-0.15	-0.25	0	0	0	0	0	0	-0.4	0	0	0	-0.2	0	0	0	0	0	-0.2	0	0	-0.15	0	**-0.044**
CTBS	ENSG00000117151	1p22.3	0	0	0	0	0	0	0	0	0	-0.25	0	0	-0.15	-0.25	0	0	0	0	0	0	-0.4	0	0	0	-0.2	0	0	0	0	0	-0.2	0	0	-0.15	0	**-0.044**
C1orf180	ENSG00000180869	1p22.3	0	0	0	0	0	0	0	0	0	-0.25	0	0	-0.15	-0.25	0	0	0	0	0	0	-0.4	0	0	0	-0.2	0	0	0	0	0	-0.2	0	0	-0.15	0	**-0.044**
SSX2IP	ENSG00000117155	1p22.3	0	0	0	0	0	0	0	0	0	-0.25	0	0	-0.15	-0.25	0	0	0	0	0	0	-0.4	0	0	0	-0.2	0	0	0	0	0	-0.2	0	0	-0.15	0	**-0.044**
LPAR3	ENSG00000171517	1p22.3	0	0	0	0	0	0	0	0	0	-0.25	0	0	-0.15	-0.25	0	0	0	0	0	0	-0.4	0	0	0	-0.2	0	0	0	0	0	-0.2	0	0	-0.15	0	**-0.044**
MCOLN2	ENSG00000153898	1p22.3	0	0	0	0	0	0	0	0	0	-0.25	0	0	-0.15	-0.25	0	0	0	0	0	0	-0.4	0	0	0	-0.2	0	0	0	0	0	-0.2	0	0	-0.15	0	**-0.044**
WDR63	ENSG00000162643	1p22.3	0	0	0	0	0	0	0	0	0	-0.25	0	0	-0.15	-0.25	0	0	0	0	0	0	-0.4	0	0	0	-0.2	0	0	0	0	0	-0.2	0	0	-0.15	0	**-0.044**
MCOLN3	ENSG00000055732	1p22.3	0	0	0	0	0	0	0	0	0	-0.25	0	0	-0.15	-0.25	0	0	0	0	0	0	-0.4	0	0	0	-0.2	0	0	0	0	0	-0.2	0	0	-0.15	0	**-0.044**
SYDE2	ENSG00000097096	1p22.3	0	0	0	0	0	0	0	0	0	-0.25	0	0	-0.15	-0.25	0	0	0	0	0	0	-0.4	0	0	0	-0.2	0	0	0	0	0	-0.2	0	0	-0.15	0	**-0.044**
C1orf52	ENSG00000162642	1p22.3	0	0	0	0	0	0	0	0	0	-0.25	0	0	-0.15	-0.25	0	0	0	0	0	0	-0.4	0	0	0	-0.2	0	0	0	0	0	-0.2	0	0	-0.15	0	**-0.044**
BCL10	ENSG00000142867	1p22.3	0	0	0	0	0	0	0	0	0	-0.25	0	0	-0.15	-0.25	0	0	0	0	0	0	-0.4	0	0	0	-0.2	0	0	0	0	0	-0.2	0	0	-0.15	0	**-0.044**
DDAH1	ENSG00000153904	1p22.3	0	0	0	0	0	0	0	0	0	-0.25	0	0	-0.15	-0.25	0	0	0	0	0	0	-0.4	0	0	0	-0.2	0	0	0	0	0	-0.2	0	0	-0.15	0	**-0.044**
CYR61	ENSG00000142871	1p22.3	0	0	0	0	0	0	0	0	0	-0.25	0	0	-0.15	-0.25	0	0	0	0	0	0	-0.4	0	0	0	-0.2	0	0	0	0	0	-0.2	0	0	-0.15	0	**-0.044**
ZNHIT6	ENSG00000117174	1p22.3	0	0	0	0	0	0	0	0	0	-0.25	0	0	-0.15	-0.25	0	0	0	0	0	0	-0.4	0	0	0	-0.2	0	0	0	0	0	-0.2	0	0	-0.15	0	**-0.044**
COL24A1	ENSG00000171502	1p22.3	0	0	0	0	0	0	0	0	0	-0.25	0	0	-0.15	-0.25	0	0	0	0	0	0	-0.4	0	0	0	-0.2	0	0	0	0	0	-0.2	0	0	-0.15	0	**-0.044**
ODF2L	ENSG00000122417	1p22.3	0	0	0	0	0	0	0	0	0	-0.25	0	0	-0.15	-0.25	0	0	0	0	0	0	-0.4	0	0	0	-0.2	0	0	0	0	0	-0.2	0	0	-0.15	0	**-0.044**
CLCA2	ENSG00000137975	1p22.3	0	0	0	0	0	0	0	0	0	-0.25	0	0	-0.15	-0.25	0	0	0	0	0	0	-0.4	0	0	0	-0.2	0	0	0	0	0	-0.2	0	0	-0.15	0	**-0.044**
CLCA1	ENSG00000016490	1p22.3	0	0	0	0	0	0	0	0	0	-0.25	0	0	-0.15	-0.25	0	0	0	0	0	0	-0.4	0	0	0	-0.2	0	0	0	0	0	-0.2	0	0	-0.15	0	**-0.044**
CLCA4	ENSG00000016602	1p22.3	0	0	0	0	0	0	0	0	0	-0.25	0	0	-0.15	-0.25	0	0	0	0	0	0	-0.4	0	0	0	-0.2	0	0	0	0	0	-0.2	0	0	-0.15	0	**-0.044**
SH3GLB1	ENSG00000097033	1p22.3	0	0	0	0	0	0	0	0	0	-0.25	0	0	-0.15	-0.25	0	0	0	0	0	0	-0.4	0	0	0	-0.2	0	0	0	0	0	-0.2	0	0	-0.15	0	**-0.044**
RP4-604K5.1	ENSG00000183291	1p22.3	0	0	0	0	0	0	0	0	0	-0.25	0	0	-0.15	-0.25	0	0	0	0	0	0	-0.4	0	0	0	-0.2	0	0	0	0	0	-0.2	0	0	-0.15	0	**-0.044**
HS2ST1	ENSG00000153936	1p22.3	0	0	0	0	0	0	0	0	0	-0.25	0	0	-0.15	-0.25	0	0	0	0	0	0	-0.4	0	0	0	-0.2	0	0	0	0	0	-0.2	0	0	-0.15	0	**-0.044**
RP5-1052I5.2	ENSG00000267561	1p22.3	0	0	0	0	0	0	0	0	0	-0.25	0	0	-0.15	-0.25	0	0	0	0	0	0	-0.4	0	0	0	-0.2	0	0	0	0	0	-0.2	0	0	-0.15	0	**-0.044**
LMO4	ENSG00000143013	1p22.3	0	0	0	0	0	0	0	0	0	-0.25	0	0	-0.15	-0.25	0	0	0	0	0	0	-0.4	0	0	0	-0.2	0	0	0	0	0	-0.2	0	0	-0.15	0	**-0.044**
PKN2	ENSG00000065243	1p22.2	0	0	0	0	0	0	0	0	0	-0.25	0	0	-0.15	-0.25	0	0	0	0	0	0	-0.4	0	-0.25	0	-0.2	0	0	0	0	0	-0.2	0	-0.3	-0.15	0	**-0.060**
GTF2B	ENSG00000137947	1p22.2	0	0	0	0	0	0	0	0	0	-0.25	0	0	-0.15	-0.25	0	0	0	0	-0.15	0	-0.4	0	-0.25	0	-0.2	0	0	0	0	0	-0.2	0	-0.3	-0.15	0	**-0.064**
CCBL2	ENSG00000137944	1p22.2	0	0	0	0	0	0	0	0	0	-0.25	0	0	-0.15	-0.25	0	0	0	0	-0.15	0	-0.4	0	-0.25	0	-0.2	0	0	0	0	0	-0.2	0	-0.3	-0.15	0	**-0.064**
RBMXL1	ENSG00000213516	1p22.2	0	0	0	0	0	0	0	0	0	-0.25	0	0	-0.15	-0.25	0	0	0	0	-0.15	0	-0.4	0	-0.25	0	-0.2	0	0	0	0	0	-0.2	0	-0.3	-0.15	0	**-0.064**
GBP3	ENSG00000117226	1p22.2	0	0	0	0	0	0	0	0	0	-0.25	0	0	-0.15	-0.25	0	0	0	0	-0.15	0	-0.4	0	-0.25	0	-0.2	0	0	0	0	0	-0.2	0	-0.3	-0.15	0	**-0.064**
GBP1	ENSG00000117228	1p22.2	0	0	0	0	0	0	0	0	0	-0.25	0	0	-0.15	-0.25	0	0	0	0	-0.15	0	-0.4	0	-0.25	0	-0.2	0	0	0	0	0	-0.2	0	-0.3	-0.15	0	**-0.064**
GBP2	ENSG00000162645	1p22.2	0	0	0	0	0	0	0	0	0	-0.25	0	0	-0.15	-0.25	0	0	0	0	-0.15	0	-0.4	0	-0.25	0	-0.2	0	0	0	0	0	-0.2	0	-0.3	-0.15	0	**-0.064**
GBP7	ENSG00000213512	1p22.2	0	0	0	0	0	0	0	0	0	-0.25	0	0	-0.15	-0.25	0	0	0	0	-0.15	0	-0.4	0	-0.25	0	-0.2	0	0	0	0	0	-0.2	0	-0.3	-0.15	0	**-0.064**
GBP4	ENSG00000162654	1p22.2	0	0	0	0	0	0	0	0	0	-0.25	0	0	-0.15	-0.25	0	0	0	0	-0.15	0	-0.4	0	-0.25	0	-0.2	0	0	0	0	0	-0.2	0	-0.3	-0.15	0	**-0.064**
GBP5	ENSG00000154451	1p22.2	0	0	0	0	0	0	0	0	0	-0.25	0	0	-0.15	-0.25	0	0	0	0	-0.15	0	-0.4	0	-0.25	0	-0.2	0	0	0	0	0	-0.2	0	-0.3	-0.15	0	**-0.064**
GBP6	ENSG00000183347	1p22.2	0	0	0	0	0	0	0	0	0	-0.25	0	0	-0.15	-0.25	0	0	0	0	-0.15	0	-0.4	0	-0.25	0	-0.2	0	0	0	0	0	-0.2	0	-0.3	-0.15	0	**-0.064**
LRRC8B	ENSG00000197147	1p22.2	0	0	0	0	0	0	0	0	0	-0.25	0	0	-0.15	-0.25	0	0	0	0	-0.15	0	-0.4	0	-0.25	0	-0.2	0	0	0	0	0	-0.2	0	-0.3	-0.15	0	**-0.064**
LRRC8C	ENSG00000171488	1p22.2	0	0	0	0	-0.4	0	0	0	0	-0.25	0	0	-0.15	-0.25	0	0	0	0	-0.15	0	-0.4	0	-0.25	0	-0.2	0	0	0	0	0	-0.2	0	-0.3	-0.15	0	**-0.075**
RP11-302M6.4	ENSG00000271949	1p22.2	0	0	0	0	-0.4	0	0	0	0	-0.25	0	0	-0.15	-0.25	0	0	0	0	-0.15	0	-0.4	0	-0.25	0	-0.2	0	0	0	0	0	-0.2	0	-0.3	-0.15	0	**-0.075**
LRRC8D	ENSG00000171492	1p22.2	0	0	0	0	-0.4	0	0	0	0	-0.25	0	0	-0.15	-0.25	0	0	0	0	-0.15	0	-0.4	0	-0.25	0	-0.2	0	0	0	0	0	-0.2	0	-0.3	-0.15	0	**-0.075**
ZNF326	ENSG00000162664	1p22.2	0	0	0	0	-0.4	0	0	0	0	-0.25	0	0	-0.15	-0.25	0	0	0	0	-0.15	0	-0.4	0	-0.25	0	-0.2	0	0	0	0	0	-0.2	0	-0.3	-0.15	0	**-0.075**
BARHL2	ENSG00000143032	1p22.2	0	0	0	0	-0.4	0	0	0	0	-0.25	0	0	-0.15	-0.25	0	0	0	0	-0.15	0	-0.4	0	-0.25	0	-0.2	0	0	0	0	0	-0.2	0	-0.3	-0.15	0	**-0.075**
ZNF644	ENSG00000122482	1p22.2	-0.5	0	0	0	-0.4	0	0	0	0	-0.25	0	0	-0.15	-0.25	0	0	0	0	-0.15	0	-0.4	0	-0.25	0	-0.2	0	0	0	0	0	-0.2	0	-0.3	-0.15	0	**-0.089**
HFM1	ENSG00000162669	1p22.2	-0.5	0	0	0	-0.4	0	0	0	0	-0.25	0	0	-0.15	-0.25	0	0	0	0	-0.15	0	-0.4	0	-0.25	0	-0.2	0	0	0	0	0	-0.2	0	-0.3	-0.15	0	**-0.089**

CDC7	ENSG00000097046	1p22.2	-0.5	0	0	0	-0.4	0	0	0	0	-0.25	0	0	-0.15	-0.25	0	0	0	0	-0.15	0	-0.4	0	-0.25	0	-0.2	0	0	0	0	0	-0.2	0	-0.3	-0.15	0	**-0.089**
TGFBR3	ENSG00000069702	1p22.1	-0.5	0	0	0	-0.4	0	0	0	0	-0.25	0	0	-0.15	-0.25	0	0	0	0	-0.15	0	-0.4	0	-0.25	0	-0.2	0	0	0	0	0	-0.2	0	-0.3	-0.15	0	**-0.089**
BRDT	ENSG00000137948	1p22.1	-0.5	0	0	0	-0.4	0	0	0	0	-0.25	0	0	-0.15	-0.25	0	0	0	0	-0.15	0	-0.4	0	-0.25	0	-0.2	0	0	0	0	0	-0.2	0	-0.3	-0.15	0	**-0.089**
EPHX4	ENSG00000172031	1p22.1	-0.5	0	0	0	-0.4	0	0	0	0	-0.25	0	0	-0.15	-0.25	0	0	0	0	-0.15	0	-0.4	0	-0.25	0	-0.2	0	0	0	0	0	-0.2	0	-0.3	-0.15	0	**-0.089**
BTBD8	ENSG00000189195	1p22.1	-0.5	0	0	0	-0.4	0	0	0	0	-0.25	0	0	-0.15	-0.25	0	0	0	0	-0.15	0	-0.4	0	-0.25	0	-0.2	0	0	0	0	0	-0.2	0	-0.3	-0.15	0	**-0.089**
KIAA1107	ENSG00000069712	1p22.1	-0.5	0	0	0	-0.4	0	0	0	0	-0.25	0	0	-0.15	-0.25	0	0	0	0	-0.15	0	-0.4	0	-0.25	-0.15	-0.2	0	0	0	0	0	-0.2	0	-0.3	-0.15	0	**-0.093**
C1orf146	ENSG00000203910	1p22.1	-0.5	0	0	0	-0.4	0	0	0	0	-0.25	0	0	-0.15	-0.25	0	0	0	0	-0.15	0	-0.4	0	-0.25	-0.15	-0.2	0	0	0	0	0	-0.2	0	-0.3	-0.15	0	**-0.093**
GLMN	ENSG00000174842	1p22.1	-0.5	0	0	0	-0.4	0	0	0	0	-0.25	0	0	-0.15	-0.25	0	0	0	0	-0.15	0	-0.4	0	-0.25	-0.15	-0.2	0	0	0	0	0	-0.2	0	-0.3	-0.15	0	**-0.093**
RPAP2	ENSG00000122484	1p22.1	-0.5	0	0	0	-0.4	0	0	0	0	-0.25	0	0	-0.15	-0.25	0	0	0	0	-0.15	0	-0.4	0	-0.25	-0.15	-0.2	0	0	0	0	0	-0.2	0	-0.3	-0.15	0	**-0.093**
GFI1	ENSG00000162676	1p22.1	-0.5	-0.3	0	0	-0.4	0	0	0	0	-0.25	0	0	-0.15	-0.25	0	0	0	0	-0.15	0	-0.4	0	-0.25	-0.15	-0.2	0	0	0	0	0	-0.2	0	-0.3	-0.15	0	**-0.101**
EVI5	ENSG00000067208	1p22.1	-0.5	-0.3	0	-0.6	-0.4	0	0	0	0	-0.25	0	0	-0.15	-0.25	0	0	0	0	-0.15	0	-0.4	0	-0.25	-0.15	-0.2	0	0	0	0	0	-0.2	0	-0.3	-0.15	0	**-0.118**
RPL5	ENSG00000122406	1p22.1	-0.5	-0.3	0	-0.6	-0.4	0	0	0	0	-0.25	0	0	-0.15	-0.25	0	0	0	0	-0.15	0	-0.4	0	-0.25	-0.15	-0.2	0	0	0	0	0	-0.2	0	-0.3	-0.15	0	**-0.118**
FAM69A	ENSG00000154511	1p22.1	-0.5	0	0	-0.6	-0.4	0	0	0	0	-0.25	0	0	-0.15	-0.25	0	0	0	0	-0.15	0	-0.4	0	-0.25	-0.15	-0.2	0	0	0	0	0	-0.2	0	-0.3	-0.15	0	**-0.110**
MTF2	ENSG00000143033	1p22.1	-0.5	0	0	-0.6	0	0	0	0	0	-0.25	0	0	-0.15	-0.25	0	0	0	0	-0.15	0	-0.4	0	-0.25	-0.15	-0.2	0	0	0	0	0	-0.2	0	-0.3	-0.15	0	**-0.099**
TMED5	ENSG00000117500	1p22.1	-0.5	0	0	0	0	0	0	0	0	-0.25	0	0	-0.15	-0.25	0	0	0	0	-0.15	0	-0.4	0	-0.25	-0.15	-0.2	0	0	0	0	0	-0.2	0	-0.3	-0.15	0	**-0.082**
CCDC18	ENSG00000122483	1p22.1	-0.5	0	0	0	0	0	0	0	0	-0.25	0	0	-0.15	-0.25	0	0	0	0	-0.15	0	-0.4	0	-0.25	-0.15	-0.2	0	0	0	0	0	-0.2	0	-0.3	-0.15	0	**-0.082**
DR1	ENSG00000117505	1p22.1	-0.5	0	0	0	0	0	0	0	0	-0.25	0	0	-0.15	-0.25	0	0	0	0	-0.15	0	-0.4	0	-0.25	-0.15	-0.2	0	0	0	0	0	-0.2	0	-0.3	-0.15	0	**-0.082**
FNBP1L	ENSG00000137942	1p22.1	-0.5	0	0	0	0	0	0	0	0	-0.25	0	0	-0.15	-0.25	0	0	0	0	-0.15	0	-0.4	0	-0.25	-0.15	-0.2	0	0	0	0	0	-0.2	0	-0.3	-0.15	0	**-0.082**
BCAR3	ENSG00000137936	1p22.1	-0.5	0	0	0	0	0	0	0	0	-0.25	0	0	-0.15	-0.25	0	0	0	0	0	0	-0.4	0	-0.25	-0.15	-0.2	0	0	0	0	0	-0.2	0	-0.3	-0.15	0	**-0.078**
DNTTIP2	ENSG00000067334	1p22.1	-0.5	0	0	0	0	0	0	0	0	-0.25	0	0	-0.15	-0.25	0	0	0	0	0	0	-0.4	0	-0.25	-0.15	-0.2	0	0	0	0	0	-0.2	0	-0.3	-0.15	0	**-0.078**
GCLM	ENSG00000023909	1p22.1	-0.5	0	0	0	0	0	0	0	0	-0.25	0	0	-0.15	-0.25	0	0	0	0	0	0	-0.4	0	-0.25	-0.15	-0.2	0	0	0	0	0	-0.2	0	-0.3	-0.15	0	**-0.078**
ABCA4	ENSG00000198691	1p22.1	-0.5	0	0	0	0	0	0	0	0	-0.25	0	0	-0.15	-0.25	0	0	0	0	0	0	-0.4	0	-0.25	-0.15	-0.2	0	0	0	0	0	-0.2	0	-0.3	-0.15	0	**-0.078**

Supplementary table 4. Calculation of mutation score of 1p22.1 genes in MMRC cohort

Gene name	# mutations in MMRC cohort	CDS length (bp)	mutation count / 1000 bp CDS	functional score (TRansFIC)	Total mutation score
CDC7	1	1725	0.58	0.38	**0.22**
TGFBR3	1	2556	0.39	0.75	**0.29**
BRDT	0	2844	0.00	0.00	**0.00**
EPHX4	3	1089	2.75	0.25	**0.69**
BTBD8	0	1137	0.00	0.00	**0.00**
KIAA1107	2	4230	0.47	0.75	**0.35**
C1orf146	0	543	0.00	0.00	**0.00**
GLMN	1	1785	0.56	0.375	**0.21**
RPAP2	0	1839	0.00	0,00	**0.00**
GFI1	0	1269	0.00	0,00	**0.00**
EVI5	2	2466	0.81	0.92	**0.74**
RPL5	1	880	1.14	0.75	**0.85**
FAM69A	0	1287	0.00	0.00	**0.00**
MTF2	0	1782	0.00	0.00	**0.00**
TMED5	0	690	0.00	0.00	**0.00**
CCDC18	0	4527	0.00	0.00	**0.00**
DR1	0	531	0.00	0.00	**0.00**
FNBP1L	0	1830	0.00	0.00	**0.00**
BCAR3	2	2478	0.81	0.25	**0.20**
DNTTIP2	1	2271	0.44	0.31	**0.14**
GCLM	0	825	0.00	0.00	**0.00**
ABCA4	1	6822	0.15	0.38	**0.05**

Supplementary table 5. Calculation of TRansFIC functional impact score

Gene	Ensembl Transcript	Ensembl Protein	Location	CDS position	protein position	AA change	siftTransfic impact	pph2TRansfic impact	Average TRansFIC score mutation	Average TRansFIC score gene
TGFBR3	ENST00000212355	ENSP00000212355	1:92184913	1522	508	R/W	medium (0.50)	high (1.00)	0.75	0.75
RPL5	ENST00000370321	ENSP00000359345	1:93298955	13	5	K/E	high (1.00)	medium (0.50)	0.75	0.75
KIAA1107	ENST00000409154	ENSP00000386957	1:92636956	425	142	A/V	medium (0.50)	high (1.00)	0.75	0.75
KIAA1107	ENST00000370378	ENSP00000359404	1:92636956	260	87	A/V	high (1.00)	medium (0.50)	0.75	
KIAA1107	ENST00000409154	ENSP00000386957	1:92647504	3115	1039	E/K	high (1.00)	medium (0.50)	0.75	
KIAA1107	ENST00000370378	ENSP00000359404	1:92647504	2950	984	E/K	high (1.00)	medium (0.50)	0.75	
GLMN	ENST00000534881	ENSP00000440156	1:92730179	1189	397	S/G	low (0.25)	medium (0.50)	0.38	0.38
GLMN	ENST00000370360	ENSP00000359385	1:92730179	1231	411	S/G	low (0.25)	medium (0.50)	0.38	
EVI5	ENST00000540033	ENSP00000440826	1:93163487	827	276	L/P	high (1.00)	high (1.00)	1.00	0.92
EVI5	ENST00000370331	ENSP00000359356	1:93163487	827	276	L/P	high (1.00)	high (1.00)	1.00	
EVI5	ENST00000543509	ENSP00000445019	1:93163487	827	276	L/P	high (1.00)	medium (0.50)	0.75	
EPHX4	ENST00000370383	ENSP00000359410	1:92528827	1073	358	T/K	low (0.25)	low (0.25)	0.25	0.25
EPHX4	ENST00000370383	ENSP00000359410	1:92528830	1076	359	R/K	low (0.25)	low (0.25)	0.25	
EPHX4	ENST00000370383	ENSP00000359410	1:92508530	468	156	D/E	low (0.25)	low (0.25)	0.25	
DNTTIP2	ENST00000436063	ENSP00000411010	1:94342244	1247	416	G/V	medium (0.50)	low (0.25)	0.38	0.31
DNTTIP2	ENST00000359208	ENSP00000352137	1:94342244	1247	416	G/V	low (0.25)	low (0.25)	0.25	
CDC7	ENST00000234626	ENSP00000234626	1:91978851	809	270	G/E	low (0.25)	medium (0.50)	0.38	0.38
CDC7	ENST00000428239	ENSP00000393139	1:91978851	809	270	G/E	low (0.25)	medium (0.50)	0.38	
CDC7	ENST00000430031	ENSP00000407477	1:91978851	725	242	G/E	low (0.25)	medium (0.50)	0.38	
BCAR3	ENST00000370244	ENSP00000359264	1:94140311	176	59	P/L	low (0.25)	low (0.25)	0.25	0.25
BCAR3	ENST00000370243	ENSP00000359263	1:94140311	176	59	P/L	low (0.25)	low (0.25)	0.25	
BCAR3	ENST00000260502	ENSP00000260502	1:94140311	176	59	P/L	low (0.25)	low (0.25)	0.25	
BCAR3	ENST00000370247	ENSP00000359267	1:94033381	1729	577	A/T	low (0.25)	low (0.25)	0.25	
BCAR3	ENST00000370244	ENSP00000359264	1:94033381	2002	668	A/T	low (0.25)	low (0.25)	0.25	
BCAR3	ENST00000539242	ENSP00000441343	1:94033381	1030	344	A/T	low (0.25)	low (0.25)	0.25	
BCAR3	ENST00000260502	ENSP00000260502	1:94033381	2002	668	A/T	low (0.25)	low (0.25)	0.25	
BCAR3	ENST00000370243	ENSP00000359263	1:94033381	2002	668	A/T	low (0.25)	low (0.25)	0.25	
ABCA4	ENST00000370225	ENSP00000359245	1:94546141	992	331	G/A	low (0.25)	medium (0.50)	0.38	0.38
ABCA4	ENST00000535735	ENSP00000437682	1:94546141	992	331	G/A	medium (0.50)	low (0.25)	0.38	

Supplementary table 6. Probesets differentially expressed between bortezomib responders and non-responders

Rank #	Probe	Gene	log2FC	P adj.
1	210532_s_at	*C14orf2*	-0,408	0,002
2	225335_at	*ZNF496*	-0,540	0,002
3	217988_at	*CCNB1IP1*	-0,590	0,002
4	229586_at	*CHD9*	0,424	0,008
5	224985_at	*NRAS*	-0,470	0,008
6	224616_at	*DYNC1LI2*	0,459	0,014
7	213941_x_at	*RPS7*	-0,340	0,014
8	**200937_s_at**	***RPL5 ; SNORD21***	**-0,553**	**0,014**
9	206790_s_at	*NDUFB1*	-0,388	0,019
10	200834_s_at	*RPS21*	-0,431	0,019
11	202232_s_at	*EIF3M*	-0,521	0,019
12	224841_x_at	*GAS5 ; SNORD44 ; SNORD47 ; SNORD74 ; SNORD76 ; SNORD77 ; SNORD79 ; SNORD80 ; SNORD81*	-0,854	0,019
13	224741_x_at	*GAS5 ; SNORD44 ; SNORD47 ; SNORD74 ; SNORD76 ; SNORD77 ; SNORD79 ; SNORD80 ; SNORD81*	-0,879	0,019
14	221180_at	*MAP3K19*	0,580	0,019
15	208752_x_at	*NAP1L1*	-0,406	0,019
16	213846_at	*COX7C*	-0,394	0,019
17	238025_at	*MLKL*	0,607	0,019
18	200921_s_at	*BTG1*	-0,666	0,019
19	201094_at	*RPS29*	-0,419	0,019
20	201592_at	*EIF3H*	-0,383	0,020
21	228539_at	*RP11-258C19.7*	0,730	0,021
22	200624_s_at	*MATR3 ; SNHG4*	-0,385	0,021
23	217719_at	*EIF3L*	-0,382	0,023
24	208796_s_at	*CCNG1*	-0,470	0,024
25	200903_s_at	*AHCY*	-0,480	0,024
26	220755_s_at	*C6orf48*	-0,581	0,024
27	225698_at	*EPB41L4A-AS1*	-0,674	0,024
28	235765_at	*TLE4*	0,845	0,025
29	213890_x_at	*RPS16*	-0,340	0,025
30	211939_x_at	*BTF3*	-0,386	0,025
31	208517_x_at	*BTF3*	-0,456	0,025
32	211938_at	*EIF4B*	-0,390	0,025
33	217491_x_at	*COX7C*	-0,423	0,025
34	239645_at	---	0,636	0,026
35	202255_s_at	*SIPA1L1*	-0,858	0,027
36	206621_s_at	*EIF4H*	-0,273	0,029
37	212136_at	*ATP2B4*	0,594	0,029
38	202605_at	*GUSB*	-0,433	0,030
39	204122_at	*TYROBP*	0,605	0,031
40	242921_at	*SGSM1*	-0,384	0,034
41	227787_s_at	*MED30*	-0,521	0,035
42	230769_at	*DENND2C*	-0,537	0,037
43	219939_s_at	*CSDE1*	-0,405	0,037
44	219396_s_at	*MIR631 ; NEIL1*	0,619	0,037
45	212787_at	*YLPM1*	-0,260	0,037
46	212328_at	*LIMCH1*	0,681	0,037
47	207542_s_at	*AQP1*	0,774	0,037
48	221745_at	*DCAF7*	0,327	0,037
49	201705_at	*PSMD7*	0,318	0,037
50	209472_at	*CCBL2*	-0,375	0,037
51	236245_at	*ODF3L1*	-0,807	0,037
52	218601_at	*URGCP*	-0,600	0,037
53	201653_at	*CNIH1*	-0,497	0,037
54	231605_at	---	0,672	0,037
55	202010_s_at	*PTGR2 ; ZNF410*	-0,274	0,037
56	200626_s_at	*MATR3 ; SNHG4*	-0,316	0,037
57	200941_at	*HSBP1*	0,269	0,037
58	201520_s_at	*GRSF1*	-0,374	0,037
59	221434_s_at	*SLIRP*	-0,380	0,037
60	213041_s_at	*ATP5D*	-0,456	0,037
61	202023_at	*EFNA1*	0,443	0,037
62	208536_s_at	*BCL2L11*	-0,480	0,037
63	203542_s_at	*KLF9*	0,588	0,037
64	213376_at	*ZBTB1*	-0,391	0,037
65	219217_at	*NARS2*	-0,307	0,037
66	226835_s_at	*ZFAS1*	-0,547	0,037

67	215011_at	*SNHG3 ; SNORA73A*	0,400	0,037
68	225951_s_at	*LOC100507217*	-0,387	0,037
69	205404_at	*HSD11B1*	0,560	0,037
70	224874_at	*POLR1D*	-0,386	0,037
71	214714_at	*ZNF394*	-0,326	0,037
72	208764_s_at	*ATP5G2*	-0,357	0,037
73	225794_s_at	*SMDT1*	-0,394	0,037
74	200909_s_at	*RPLP2 ; SNORA52*	-0,387	0,039
75	229146_at	*C7orf31*	-0,629	0,039
76	217969_at	*VPS51*	-0,486	0,040
77	201258_at	*RPS16*	-0,412	0,040
78	205641_s_at	*TRADD*	0,554	0,040
79	213099_at	*ANGEL1*	-0,705	0,040
80	238656_at	*RAD50*	0,293	0,040
81	219233_s_at	*GSDMB*	0,729	0,041
82	224915_x_at	*ZFAS1*	-0,581	0,041
83	222968_at	---	-0,973	0,041
84	202929_s_at	*DDT ; DDTL*	-0,391	0,042
85	221475_s_at	*RPL15*	-0,435	0,044
86	203590_at	*DYNC1LI2*	0,610	0,045
87	205744_at	*DOC2A*	0,599	0,046
88	219261_at	*C7orf26*	-0,662	0,046
89	219065_s_at	*DPY30 ; MEMO1*	-0,251	0,046
90	225349_at	*ZNF496*	-0,769	0,046
91	222783_s_at	*SMOC1*	-0,761	0,047
92	216069_at	*PRMT2*	0,610	0,048
93	202248_at	*E2F4*	0,567	0,048
94	225710_at	*GNB4*	1,104	0,049
95	225333_at	*ZNF496*	-0,640	0,049
96	225230_at	*DRAM2*	-0,488	0,049
97	206874_s_at	*SLK*	0,290	0,051
98	209576_at	*GNAI1*	0,513	0,051
99	212826_s_at	*SLC25A6*	-0,504	0,051
100	227640_s_at	*RP9 ; RP9P*	-0,316	0,051
101	235505_s_at	*LRPAP1*	0,677	0,051
102	226645_at	---	0,598	0,051
103	208540_x_at	*S100A11P1 ; S100A11P1*	0,368	0,051
104	220575_at	*FAM106A*	0,579	0,051
105	217897_at	*FXYD6*	0,613	0,051
106	208697_s_at	*EIF3E*	-0,368	0,051
107	200907_s_at	*PALLD*	0,674	0,051
108	223245_at	*STRBP*	-0,279	0,051
109	218101_s_at	*NDUFC2 ; NDUFC2-KCTD14*	-0,272	0,051
110	41858_at	*PGAP2*	-0,305	0,051
111	214709_s_at	*KTN1*	-0,347	0,051
112	213311_s_at	*TCF25*	0,437	0,051
113	221124_s_at	*VSX1*	0,321	0,051
114	200936_at	*RPL8*	-0,348	0,051
115	221978_at	*HLA-F*	0,326	0,051
116	212681_at	*EPB41L3*	0,349	0,053
117	226227_x_at	*ZFAS1*	-0,533	0,054
118	202647_s_at	*NRAS*	-0,425	0,054
119	200981_x_at	*GNAS*	-0,380	0,055
120	215385_at	---	0,603	0,056
121	201840_at	*NEDD8*	-0,288	0,056
122	207573_x_at	*ATP5L*	-0,381	0,056
123	226169_at	*SBF2*	-0,523	0,056
124	238662_at	*DPH6*	-0,508	0,056
125	213256_at	*37681*	0,471	0,056
126	221680_s_at	*ETV7*	0,423	0,057
127	239792_at	*UBL7-AS1*	-0,478	0,057
128	210564_x_at	*CFLAR*	0,349	0,057
129	1729_at	*TRADD*	0,580	0,057
130	202011_at	*TJP1*	0,755	0,057
131	200860_s_at	*CNOT1*	0,234	0,057
132	211904_x_at	*RAD52*	0,610	0,057
133	204351_at	*S100P*	0,622	0,058
134	207862_at	*UPK2*	0,568	0,058
135	210006_at	*ABHD14A ; ACY1*	-0,414	0,058

136	208746_x_at	*ATP5L*	-0,366	0,058
137	223714_at	*ZNF256*	-0,566	0,058
138	218869_at	*MLYCD*	0,463	0,058
139	223025_s_at	*AP1M1*	-0,391	0,058
140	212893_at	*ZZZ3*	-0,273	0,058
141	207855_s_at	*CLCC1*	-0,402	0,058
142	203568_s_at	*TRIM38*	0,343	0,058
143	215210_s_at	*DLST*	-0,311	0,058
144	213687_s_at	*RPL35A*	-0,372	0,058
145	212332_at	*RBL2*	0,474	0,058
146	225190_x_at	*RPL35A*	-0,375	0,059
147	201134_x_at	*COX7C*	-0,374	0,060
148	205457_at	*C6orf106*	0,340	0,060
149	226131_s_at	*RPS16*	-0,272	0,062
150	222893_s_at	*RPAP2*	-0,381	0,063
151	211567_at	---	0,431	0,065
152	205196_s_at	*AP1S1*	-0,473	0,065
153	216570_x_at	*RP4-595K12.1*	-0,349	0,065
154	200949_x_at	*RPS20 ; SNORD54*	-0,267	0,065
155	215538_at	---	0,377	0,065
156	201486_at	*RCN2*	-0,438	0,065
157	218684_at	*LRRC8D*	-0,319	0,065
158	207040_s_at	*ST13*	-0,279	0,066
159	234926_s_at	*RTFDC1*	-0,225	0,067
160	223847_s_at	*ERGIC1*	-0,331	0,067
161	235204_at	*ENTPD7*	0,282	0,067
162	233268_s_at	*CHURC1*	-0,357	0,067
163	219666_at	*MS4A6A*	0,606	0,067
164	203113_s_at	*EEF1D*	-0,396	0,067
165	200826_at	*SNRPD2*	-0,293	0,068
166	200920_s_at	*BTG1*	-0,544	0,069
167	211813_x_at	*DCN*	0,478	0,069
168	209475_at	*MIR6125 ; USP15*	0,297	0,069
169	204389_at	*MAOA*	0,443	0,069
170	231226_at	*MED14OS*	0,549	0,070
171	228658_at	*MIAT*	0,697	0,070
172	217433_at	*TACC1*	0,144	0,070
173	231047_at	---	0,492	0,070
174	211755_s_at	*ATP5F1*	-0,312	0,071
175	227228_s_at	*CCDC88C*	-0,401	0,073
176	213071_at	*DPT*	0,437	0,073
177	238523_at	*KLHL36*	0,729	0,073
178	212344_at	*SULF1*	0,558	0,073
179	224862_at	*GNAQ*	0,734	0,073
180	212085_at	*SLC25A6*	-0,514	0,073
181	203190_at	*MIR4691 ; MIR7113 ; NDUFS8*	-0,215	0,073
182	200869_at	*RPL18A ; SNORA68*	-0,384	0,074
183	228175_at	*SLC4A8*	-0,471	0,074
184	211747_s_at	*LSM5*	-0,299	0,074
185	211666_x_at	*RNU86 ; RPL3 ; SNORD83B*	-0,426	0,075
186	225714_s_at	---	-0,346	0,075
187	210139_s_at	*PMP22*	0,632	0,075
188	213275_x_at	*CTSB*	0,477	0,075
189	207585_s_at	*RPL36AL*	-0,356	0,075
190	212135_s_at	*ATP2B4*	0,445	0,076
191	225547_at	*SNHG6 ; SNORD87*	-0,426	0,076
192	213995_at	*ATP5S*	-0,366	0,076
193	202231_at	*EIF3M*	-0,308	0,080
194	229388_at	*LOC101929112*	0,572	0,080
195	219577_s_at	*ABCA7*	0,410	0,080
196	214776_x_at	*XYLB*	0,308	0,081
197	224182_x_at	*SEMA6B*	0,578	0,081
198	53987_at	*RANBP10*	0,323	0,081
199	219429_at	*FA2H*	0,629	0,084
200	225315_at	*MRPL21*	-0,261	0,084
201	236428_at	---	0,690	0,085
202	211711_s_at	*PTEN*	-0,325	0,085
203	202725_at	*POLR2A*	0,401	0,085
204	205119_s_at	*FPR1*	0,405	0,085

205	222465_at	*RSL24D1*	-0,425	0,085
206	217702_at	*IL27RA*	0,543	0,085
207	228489_at	*TM4SF18*	0,683	0,086
208	214800_x_at	*BTF3*	-0,305	0,086
209	56821_at	*SLC38A7*	0,468	0,087
210	37986_at	*EPOR*	0,590	0,087
211	217729_s_at	*AES*	-0,334	0,087
212	227174_at	*WDR72*	-0,700	0,087
213	243692_at	*GATA4*	0,586	0,087
214	211653_x_at	*AKR1C2 ; LOC101930400*	0,432	0,087
215	230131_x_at	*ARSD*	0,322	0,088
216	228726_at	*SERPINB1*	0,615	0,088
217	226296_s_at	*MRPS15*	-0,427	0,088
218	212273_x_at	*GNAS*	-0,350	0,088
219	215265_at	---	0,624	0,088
220	200660_at	*S100A11*	0,815	0,088
221	217980_s_at	*MRPL16*	-0,234	0,088
222	200963_x_at	*RPL31*	-0,315	0,088
223	211374_x_at	---	0,573	0,088
224	239092_at	*ITGA8*	-0,602	0,088
225	200823_x_at	*RPL29*	-0,466	0,088
226	214179_s_at	*NFE2L1*	0,384	0,088
227	236840_at	*C12orf56*	-0,544	0,089
228	232075_at	*WDR61*	-0,261	0,089
229	224439_x_at	*RNF7*	-0,340	0,090
230	224196_x_at	*DPH5*	-0,274	0,090
231	226474_at	*NLRC5*	0,401	0,090
232	210453_x_at	*ATP5L*	-0,324	0,090
233	218927_s_at	*CHST12*	-0,397	0,090
234	223671_x_at	*DPH5*	-0,258	0,090
235	213362_at	*PTPRD*	0,526	0,090
236	202467_s_at	*COPS2*	-0,387	0,090
237	225054_x_at	*LINC00674*	0,561	0,090
238	241017_at	*RPL31 ; TBC1D8*	-0,346	0,090
239	212240_s_at	*PIK3R1*	0,298	0,091
240	200811_at	*CIRBP*	-0,337	0,091
241	202202_s_at	*LAMA4*	0,469	0,091
242	209397_at	*ME2*	-0,412	0,092
243	211316_x_at	*CFLAR*	0,341	0,092
244	201773_at	*ADNP*	-0,288	0,092
245	214411_x_at	*CTRB2*	0,367	0,092
246	211942_x_at	*RPL13A ; RPL13AP5 ; RPL13AP6 ; SNORD32A ; SNORD33 ; SNORD34 ; SNORD35A*	-0,408	0,092
247	232829_at	*OR52K3P*	0,677	0,092
248	222368_at	---	0,335	0,092
249	214388_at	---	0,472	0,092
250	224345_x_at	*FAM162A*	-0,429	0,092
251	219590_x_at	*DPH5*	-0,222	0,094
252	218286_s_at	*RNF7*	-0,269	0,094
253	225063_at	*UBL7*	-0,469	0,094
254	219762_s_at	*RPL36*	-0,419	0,094
255	241929_at	---	0,640	0,094
256	201812_s_at	*C4orf46 ; TOMM7*	-0,317	0,094
257	223165_s_at	*IP6K2*	-0,345	0,094
258	215542_at	---	0,368	0,094
259	209473_at	*ENTPD1*	0,478	0,094
260	211662_s_at	*VDAC2*	-0,242	0,094
261	242715_at	*ZNF536*	-0,662	0,094
262	218495_at	*UXT*	-0,326	0,094
263	225706_at	*GLCCI1*	-0,485	0,094
264	214649_s_at	*MTMR2*	-0,537	0,094
265	211506_s_at	*CXCL8*	0,540	0,094
266	243771_at	---	-0,640	0,094
267	237176_at	---	0,247	0,094
268	205220_at	*HCAR3*	0,509	0,094
269	208635_x_at	*NACA*	-0,335	0,094
270	200781_s_at	*RPS15A*	-0,310	0,094
271	222975_s_at	*CSDE1*	-0,383	0,094
272	221809_at	*RANBP10*	0,675	0,094
273	202783_at	*NNT*	-0,465	0,094

274	209387_s_at	*TM4SF1*	0,448	0,094
275	212488_at	*COL5A1*	0,589	0,094
276	216418_at	*ABCD1P2 ; ABCD1P2*	0,338	0,094
277	209939_x_at	*CFLAR*	0,558	0,095
278	223015_at	*EIF2A*	-0,319	0,095
279	216022_at	---	0,565	0,095
280	228950_s_at	*WLS*	-0,751	0,095
281	208308_s_at	*GPI*	-0,306	0,096
282	218314_s_at	*C11orf57*	-0,245	0,096
283	228944_at	*RP4-773N10.4*	-0,393	0,096
284	218038_at	*ATP5SL*	-0,488	0,096
285	205043_at	*CFTR*	0,306	0,096
286	209012_at	*TRIO*	0,599	0,096
287	208323_s_at	*ANXA13*	-0,562	0,096
288	213112_s_at	*SQSTM1*	0,418	0,098
289	225373_at	*C10orf54*	0,406	0,098
290	214484_s_at	*SIGMAR1*	-0,554	0,098
291	225065_x_at	*LRRC75A-AS1 ; SNORD49A ; SNORD49B ; SNORD65*	-0,515	0,098
292	202344_at	*HSF1*	-0,502	0,098
293	217673_x_at	*GNAS*	-0,326	0,098
294	202803_s_at	*ITGB2*	0,456	0,098
295	235005_at	*DIS3L*	-0,282	0,098
296	225700_at	*GLCCI1*	-0,559	0,098
297	221934_s_at	*DALRD3*	-0,315	0,098
298	238436_s_at	*ZNF805*	0,201	0,098
299	206350_at	*APCS*	0,455	0,098
300	203384_s_at	*GOLGA1*	0,307	0,098
301	211937_at	*EIF4B*	-0,350	0,098
302	225614_at	*SAAL1*	-0,219	0,098
303	220942_x_at	*FAM162A*	-0,321	0,098
304	217915_s_at	*RSL24D1*	-0,360	0,098
305	202961_s_at	*ARMC2-AS1 ; ATP5J2*	-0,310	0,098
306	204944_at	*PTPRG*	-0,860	0,098
307	231914_at	*NUDT14*	-0,492	0,098
308	209151_x_at	*TCF3*	-0,560	0,098
309	214756_x_at	*PMS2P1*	-0,211	0,098
310	221495_s_at	*TCF25*	0,278	0,099
311	226236_at	*LINC00493*	-0,382	0,099
312	221667_s_at	*HSPB8*	0,557	0,100
313	234875_at	*RPL7AP10 ; RPL7AP10*	-0,375	0,100
314	212768_s_at	*OLFM4*	0,342	0,100
315	229399_at	*CCDC186*	0,308	0,100
316	208359_s_at	*KCNJ4*	0,572	0,100
317	234932_s_at	*CDCP1*	0,423	0,100
318	35160_at	*LDB1*	0,340	0,100
319	205429_s_at	*MPP6*	-0,589	0,100
320	224859_at	*CD276*	0,236	0,100
321	213356_x_at	*HNRNPA1 ; HNRNPA1L2 ; HNRNPA1P10 ; HNRNPA1P33*	-0,320	0,100
322	203973_s_at	*CEBPD*	0,620	0,100
323	217145_at	*IGK ; IGKC*	0,600	0,102
324	227650_at	*HSPA14*	-0,293	0,102
325	200906_s_at	*PALLD*	0,519	0,102
326	202649_x_at	*RPS19*	-0,351	0,102
327	200858_s_at	*RPS8 ; SNORD38B ; SNORD55*	-0,323	0,102
328	201119_s_at	*COX8A*	-0,296	0,103
329	208178_x_at	*TRIO*	0,770	0,103
330	212018_s_at	*RSL1D1*	-0,294	0,103
331	200868_s_at	*RNF114*	-0,207	0,103
332	202012_s_at	*EXT2*	-0,281	0,104
333	202026_at	*SDHD*	-0,320	0,104
334	200651_at	*GNB2L1 ; SNORD95 ; SNORD96A*	-0,428	0,104
335	233909_at	---	0,504	0,105
336	228418_at	*EXOC5*	-0,546	0,105
337	215641_at	*SEC24D*	0,473	0,106
338	227333_at	*DCUN1D3*	-0,422	0,106
339	223193_x_at	*FAM162A*	-0,422	0,106
340	225080_at	*MYO1C*	0,252	0,106
341	202615_at	*GNAQ*	0,656	0,106
342	209187_at	*DR1*	-0,319	0,106

343	224935_at	*EIF2S3*	-0,283	0,106
344	201144_s_at	*EIF2S1*	-0,263	0,106
345	227168_at	*MIAT*	1,129	0,106
346	203720_s_at	*ERCC1*	-0,638	0,106
347	236157_at	*RBM14-RBM4 ; RBM4*	-0,537	0,106
348	231846_at	*FOXRED2*	-0,623	0,106
349	37145_at	*GNLY*	0,592	0,106
350	213059_at	*CREB3L1*	0,528	0,107
351	202096_s_at	*TSPO*	0,385	0,107
352	229863_s_at	*ELP6*	-0,449	0,107
353	241320_at	---	0,522	0,107
354	228095_at	*PHF14*	-0,345	0,107
355	217768_at	*C14orf166*	-0,278	0,107
356	201637_s_at	*FXR1*	-0,341	0,107
357	209689_at	*CCDC93*	0,490	0,107
358	211967_at	*TMEM123*	-0,516	0,108
359	215054_at	*EPOR ; RGL3*	0,696	0,108
360	203186_s_at	*S100A4*	0,933	0,108
361	202588_at	*AK1*	0,456	0,108
362	217816_s_at	*PCNP*	-0,263	0,108
363	227718_at	*MIR4657 ; PURB*	-0,353	0,108
364	205667_at	*WRN*	0,376	0,108
365	238459_x_at	*SPATA6*	0,444	0,108
366	233824_at	---	0,470	0,108
367	208645_s_at	*RPS14*	-0,307	0,108
368	213821_s_at	*IDS*	0,568	0,108
369	204282_s_at	*FARS2*	0,219	0,109
370	214080_x_at	*PRKCSH*	-0,190	0,109
371	201024_x_at	*EIF5B*	0,311	0,109
372	201066_at	*CYC1*	-0,319	0,109
373	214673_s_at	*HUWE1*	0,467	0,109
374	229013_at	*LOC145783 ; ZNF280D*	-0,383	0,109
375	202591_s_at	*SSBP1*	-0,311	0,109
376	209160_at	*AKR1C3*	0,802	0,109
377	200595_s_at	*EIF3A*	-0,215	0,110
378	209018_s_at	*PINK1*	0,249	0,110
379	214687_x_at	*ALDOA*	-0,282	0,110
380	212007_at	*UBXN4*	0,270	0,110
381	224931_at	*SLC41A3*	-0,359	0,110
382	201405_s_at	*COPS6*	-0,194	0,111
383	204661_at	*CD52*	0,965	0,111
384	211581_x_at	*LST1*	0,652	0,111
385	223157_at	*NOA1*	-0,363	0,111
386	209330_s_at	*HNRNPD*	-0,254	0,111
387	**213080_x_at**	***RPL5 ; SNORD21***	**-0,340**	**0,112**
388	225846_at	*ESRP1*	0,874	0,112
389	243005_at	---	0,553	0,112
390	219291_at	*DTWD1*	-0,375	0,112
391	227525_at	*GLCCI1*	-0,530	0,112
392	203530_s_at	*STX4*	0,261	0,112
393	238507_at	---	-0,258	0,112
394	229344_x_at	*RIMKLB*	0,323	0,112
395	207643_s_at	*TNFRSF1A*	0,502	0,112
396	200846_s_at	*PPP1CA*	-0,283	0,112
397	213539_at	*CD3D*	0,576	0,112
398	213414_s_at	*RPS19*	-0,305	0,112
399	216072_at	*DSTNP1 ; DSTNP1*	0,487	0,112
400	201825_s_at	*SCCPDH*	-0,693	0,112
401	205226_at	*PDGFRL*	0,525	0,113
402	220534_at	*LOC101930235 ; TRIM48 ; TRIM49D1 ; TRIM49D2P*	0,431	0,113
403	208699_x_at	*TKT*	-0,377	0,113
404	47083_at	*C7orf26*	-0,192	0,113
405	200726_at	*PPP1CC*	-0,238	0,113
406	209136_s_at	*USP10*	0,323	0,113
407	231186_at	*LINC00643*	-0,675	0,113
408	201532_at	*PSMA3*	-0,387	0,113
409	224768_at	*IWS1*	0,186	0,113
410	212315_s_at	*NUP210*	-0,500	0,113
411	234102_at	*RASL11B*	0,516	0,113

412	206174_s_at	*PPP6C*	-0,264	0,113
413	210357_s_at	*SMOX*	0,633	0,113
414	208854_s_at	*STK24*	-0,278	0,113
415	219607_s_at	*MS4A4A*	0,437	0,113
416	208717_at	*OXA1L*	-0,358	0,114
417	225040_s_at	*RPE*	-0,579	0,115
418	230306_at	*VPS26B*	-0,342	0,115
419	221691_x_at	*NPM1*	-0,428	0,115
420	204317_at	*GTSE1 ; TRMU*	0,446	0,115
421	200735_x_at	*NACA*	-0,306	0,115
422	201682_at	*PMPCB*	-0,278	0,115
423	219526_at	*C14orf169*	-0,208	0,115
424	233931_at	---	0,597	0,115
425	201893_x_at	*DCN*	0,367	0,115
426	213864_s_at	*NAP1L1*	-0,361	0,115
427	234980_at	*TMEM56*	0,650	0,115
428	217485_x_at	*PMS2P1*	-0,215	0,116
429	214880_x_at	*CALD1*	0,456	0,116
430	202920_at	*ANK2*	0,449	0,116
431	238461_at	*EIF4E3*	-0,469	0,116
432	204005_s_at	*PAWR*	-0,373	0,116
433	222997_s_at	*MRPS21*	-0,388	0,116
434	201154_x_at	*RPL4 ; SNORD16 ; SNORD18A ; SNORD18B ; SNORD18C*	-0,377	0,116
435	210666_at	*IDS*	0,816	0,116
436	223191_at	*COX16*	-0,257	0,116
437	202991_at	*STARD3*	0,403	0,116
438	206358_at	*PRM1*	0,314	0,116
439	211993_at	*WNK1*	0,518	0,117
440	218316_at	*TIMM9*	-0,202	0,117
441	208742_s_at	*SAP18*	-0,270	0,117
442	230032_at	*OSGEPL1*	-0,264	0,117
443	216342_x_at	*RPS4XP2 ; RPS4XP2*	-0,293	0,117
444	213274_s_at	*CTSB*	0,275	0,117
445	226448_at	*FAM89A ; MIR1182*	0,278	0,117
446	224936_at	*EIF2S3*	-0,278	0,117
447	219483_s_at	*PORCN*	-0,196	0,117
448	206860_s_at	*MIOS*	-0,193	0,117
449	204433_s_at	*SPATA2*	-0,490	0,117
450	208438_s_at	*FGR*	0,696	0,117
451	213193_x_at	*TRBC1*	0,374	0,117
452	213762_x_at	*LOC101928747 ; RBMX ; SNORD61*	-0,249	0,117
453	226231_at	*PAWR*	-0,520	0,117
454	212750_at	*PPP1R16B*	-0,826	0,117
455	219543_at	*PBLD*	0,428	0,117
456	213860_x_at	*CSNK1A1*	-0,208	0,117
457	203325_s_at	*COL5A1*	0,528	0,117
458	212041_at	*ATP6V0D1*	0,266	0,117
459	219332_at	*MICALL2*	0,623	0,117
460	244379_at	*LOC101927507*	0,619	0,117
461	203258_at	*DRAP1*	-0,313	0,117
462	217926_at	*C19orf53*	-0,293	0,117
463	228159_at	*WDFY2*	0,501	0,117
464	239265_at	*SLC35G1*	-0,556	0,117
465	228765_at	*GTF2IRD2*	-0,227	0,117
466	226505_x_at	*USP32*	0,438	0,117
467	220774_at	*DYM*	0,395	0,117
468	213382_at	*MST1L*	0,405	0,117
469	217747_s_at	*RPS9*	-0,358	0,117
470	203489_at	*SIVA1*	-0,311	0,117
471	226100_at	*KMT2E*	-0,293	0,117
472	219535_at	*HUNK*	0,337	0,117
473	212982_at	*ZDHHC17*	0,305	0,117
474	208247_at	*ERC2-IT1*	0,558	0,118
475	223029_s_at	*TRAF7*	-0,466	0,119
476	228389_at	---	0,544	0,119
477	223296_at	*SLC25A33*	-0,401	0,120
478	209508_x_at	*CFLAR*	0,333	0,120
479	200705_s_at	*EEF1B2 ; SNORA41*	-0,335	0,120
480	210153_s_at	*ME2*	-0,445	0,120

481	235705_at	---	0,729	0,120
482	223279_s_at	*UACA*	0,700	0,120
483	209878_s_at	*RELA*	-0,358	0,120
484	212967_x_at	*NAP1L1*	-0,332	0,120
485	203829_at	*ELP4*	-0,279	0,120
486	209063_x_at	*PAIP1*	-0,256	0,121
487	227197_at	*ARHGEF26*	0,431	0,121
488	205022_s_at	*FOXN3*	-0,349	0,121
489	213969_x_at	*RPL29*	-0,359	0,121
490	226058_at	*B3GNT9*	0,261	0,121
491	201420_s_at	*WDR77*	-0,457	0,121
492	210205_at	*B3GALT4*	0,553	0,121
493	226246_at	*KCTD1*	-0,541	0,121
494	207818_s_at	*HTR7*	0,272	0,121
495	218398_at	*MRPS30*	-0,256	0,121
496	232962_x_at	---	0,515	0,121
497	202041_s_at	*FIBP*	-0,262	0,121
498	209625_at	*PIGH*	-0,550	0,122
499	226014_at	---	-0,503	0,122
500	201554_x_at	*GYG1*	-0,454	0,122
501	204555_s_at	*PPP1R3D*	0,580	0,122
502	226289_at	*CAPRIN1*	-0,591	0,122
503	227825_at	*NAIF1*	-0,222	0,122
504	243198_at	*TEX9*	0,802	0,122
505	210949_s_at	*EIF3C ; EIF3CL*	-0,265	0,122
506	200818_at	*ATP5O*	-0,313	0,122
507	218258_at	*POLR1D*	-0,314	0,123
508	240656_at	---	-0,542	0,123
509	208887_at	*EIF3G*	-0,324	0,123
510	217878_s_at	*CDC27*	0,239	0,123
511	202948_at	*IL1R1*	0,504	0,123
512	214688_at	*TLE4*	0,343	0,123
513	202771_at	*PIEZO1*	0,580	0,123
514	232445_at	*SYT9*	0,565	0,123
515	229938_at	*TMEM238*	-0,591	0,123
516	209607_x_at	*LOC101929857 ; SLX1A-SULT1A3 ; SLX1B-SULT1A4 ; SULT1A3 ; SULT1A4*	0,319	0,123
517	205315_s_at	*SNTB2*	0,508	0,123
518	224857_s_at	*POLR1D*	-0,679	0,123
519	201892_s_at	*IMPDH2*	-0,449	0,123
520	210314_x_at	*TNFSF13*	0,693	0,123
521	235415_at	*RPRD2*	-0,245	0,123
522	211927_x_at	*EEF1G ; MIR3654*	-0,270	0,123
523	221437_s_at	*MRPS15*	-0,529	0,123
524	215602_at	*FGD2*	0,387	0,123
525	234339_s_at	*GLTSCR2 ; SNORD23*	-0,426	0,123
526	228851_s_at	*ENSA*	-0,855	0,123
527	208669_s_at	*EID1*	-0,427	0,123
528	221571_at	*TRAF3*	-0,451	0,123
529	1316_at	*THRA*	0,284	0,123
530	203567_s_at	*TRIM38*	0,282	0,123
531	209286_at	*CDC42EP3*	-0,450	0,123
532	216348_at	*RPS17P5 ; RPS17P5*	-0,405	0,123
533	209382_at	*POLR3C*	-0,264	0,124
534	218729_at	*LXN*	0,528	0,124
535	224863_at	*GNAQ*	0,510	0,124
536	201106_at	*GPX4*	-0,275	0,124
537	211428_at	*SERPINA1*	0,420	0,124
538	235214_at	*LURAP1*	-0,504	0,124
539	234438_at	---	0,352	0,125
540	203849_s_at	*KIF1A*	0,566	0,125
541	240986_at	*LOC101928943*	0,535	0,125
542	226574_at	*PSPC1*	-0,268	0,125
543	219033_at	*PARP8*	-0,259	0,125
544	227281_at	*SLC29A4*	-0,443	0,125
545	243954_at	*LINC00877*	0,681	0,125
546	223474_at	*IRF2BPL*	-0,398	0,126
547	224825_at	*DNTTIP1*	-0,549	0,126
548	212425_at	*SCAMP1*	0,281	0,126
549	230166_at	*KIAA1958*	-0,454	0,126

550	243901_at	*ALDOB*	-0,422	0,127
551	230582_at	*HECA*	0,482	0,127
552	244623_at	*KCNQ5*	-0,414	0,127
553	212790_x_at	*RPL13A ; RPL13AP5 ; SNORD32A ; SNORD33 ; SNORD34 ; SNORD35A*	-0,295	0,127
554	34210_at	*CD52*	0,853	0,127
555	201043_s_at	*ANP32A*	-0,427	0,129
556	204976_s_at	*AMMECR1*	0,358	0,129
557	205797_s_at	*TCP11L1*	-0,451	0,129
558	217503_at	*STK17B*	-0,327	0,129
559	200635_s_at	*PTPRF*	0,545	0,130
560	204031_s_at	*PCBP2*	-0,294	0,130
561	219181_at	*LIPG*	0,407	0,130
562	217034_at	*LOC101928457*	0,413	0,130
563	212680_x_at	*PPP1R14B*	-0,364	0,130
564	226165_at	*C8orf59*	-0,254	0,131
565	202233_s_at	*UQCRH ; UQCRHL*	-0,294	0,131
566	211896_s_at	*DCN*	0,411	0,132
567	217761_at	*ADI1*	0,310	0,132
568	207926_at	*GP5*	0,451	0,132
569	201732_s_at	*CLCN3*	0,306	0,132
570	217728_at	*S100A6*	0,705	0,132
571	213319_s_at	*YBX3*	0,456	0,132
572	231182_at	*WIPF1*	-0,323	0,132
573	208131_s_at	*PTGIS*	0,512	0,132
574	232279_at	*JADE2*	0,426	0,132
575	226894_at	*SLC35A3*	-0,292	0,132
576	219293_s_at	*OLA1*	-0,248	0,132
577	223260_s_at	*POLK*	-0,344	0,132
578	225237_s_at	*MSI2*	-0,422	0,132
579	216089_at	*MCFD2P1 ; MCFD2P1*	0,364	0,132
580	222513_s_at	*SORBS1*	0,424	0,132
581	211771_s_at	*POU2F2*	0,527	0,132
582	204006_s_at	*FCGR3A ; FCGR3B*	0,554	0,132
583	240009_at	*LINC00334*	-0,297	0,132
584	212599_at	*AUTS2*	0,546	0,132
585	211553_x_at	*APAF1*	0,414	0,132
586	218561_s_at	*LYRM4*	-0,338	0,132
587	242325_at	*YWHAH*	0,355	0,133
588	202469_s_at	*CPSF6*	-0,197	0,133
589	222502_s_at	*UFM1*	-0,339	0,133
590	217617_at	---	0,527	0,133
591	222762_x_at	*LIMD1*	-0,411	0,133
592	222497_x_at	*NMD3*	-0,337	0,133
593	201117_s_at	*CPE*	0,263	0,133
594	211455_at	---	-0,495	0,133
595	201016_at	*EIF1AX*	-0,274	0,133
596	203832_at	*SNRPF*	-0,351	0,133
597	220994_s_at	*STXBP6*	-0,747	0,133
598	228013_at	*PPP2R2A*	0,261	0,133
599	215067_x_at	*PRDX2*	0,618	0,134
600	214408_s_at	*RFPL1S ; RFPL3S*	0,319	0,135
601	241784_x_at	*HELQ*	0,606	0,135
602	219658_at	*PTCD2*	0,357	0,135
603	212503_s_at	*DIP2C*	0,372	0,135
604	215630_at	---	0,508	0,137
605	231005_at	---	0,524	0,137
606	204256_at	*ELOVL6*	0,429	0,137
607	208289_s_at	*EI24*	-0,244	0,137
608	215395_x_at	*PRSS3P2*	0,591	0,137
609	238729_x_at	*SAV1*	-0,571	0,137
610	204362_at	*SKAP2*	0,527	0,137
611	213601_at	*SLIT1*	0,310	0,137
612	243184_at	---	0,703	0,137
613	236741_at	*WDR72*	-0,561	0,138
614	219946_x_at	*MYH14*	0,297	0,138
615	209036_s_at	*MDH2*	-0,287	0,139
616	201406_at	*RPL36A ; RPL36A-HNRNPH2*	-0,328	0,139
617	214486_x_at	*CFLAR*	0,251	0,139
618	234000_s_at	*PTPLAD1*	-0,291	0,139

619	213729_at	*PRPF40A*	0,162	0,140
620	208428_at	*TAP2*	0,473	0,140
621	209591_s_at	*BMP7*	0,554	0,140
622	208756_at	*EIF3I*	-0,156	0,140
623	211987_at	*TOP2B*	-0,222	0,140
624	225312_at	*COMMD6*	-0,331	0,141
625	210563_x_at	*CFLAR*	0,476	0,141
626	239304_at	*MFSD4*	-0,480	0,141
627	230379_x_at	*NDUFAF7*	0,358	0,141
628	215556_at	---	0,274	0,141
629	231530_s_at	*C11orf1*	-0,439	0,141
630	233252_s_at	*STRBP*	-0,302	0,141
631	220424_at	*NPHS2*	0,471	0,141
632	208128_x_at	*KIF25*	0,429	0,141
633	200674_s_at	*RPL32*	-0,243	0,141
634	212716_s_at	*EIF3K*	-0,274	0,141
635	207644_at	*FOXH1*	0,537	0,141
636	221369_at	*MTNR1A*	0,445	0,141
637	243255_at	---	0,651	0,141
638	227194_at	*FAM3B*	-0,796	0,142
639	204563_at	*SELL*	0,696	0,143
640	236719_at	*LOC100506299*	0,502	0,144
641	221744_at	*DCAF7*	0,194	0,144
642	240250_at	---	-0,494	0,144
643	207654_x_at	*DR1*	-0,305	0,145
644	217972_at	*CHCHD3*	-0,248	0,145
645	206027_at	*S100A3*	0,495	0,146
646	204118_at	*CD48*	-0,587	0,146
647	200780_x_at	*GNAS*	-0,261	0,146
648	205640_at	*ALDH3B1*	0,483	0,146
649	202577_s_at	*DDX19A*	0,240	0,146
650	222035_s_at	*PAPOLA*	-0,314	0,146
651	221446_at	*ADAM30*	0,405	0,147
652	32128_at	*CCL18*	0,480	0,147
653	210470_x_at	*NONO*	-0,348	0,148
654	204980_at	*CLOCK*	0,235	0,148
655	202752_x_at	*SLC7A8*	0,383	0,148
656	223389_s_at	*ZNF581*	-0,458	0,148
657	217069_at	*KMT2B*	0,378	0,148
658	207824_s_at	*MAZ*	-0,401	0,148
659	209388_at	*PAPOLA*	-0,316	0,148
660	218675_at	*SLC22A17*	0,783	0,148
661	225795_at	*SMDT1*	-0,659	0,148
662	222445_at	*SLC39A9*	-0,243	0,148
663	41577_at	*PPP1R16B*	-0,773	0,148
664	212433_x_at	*RPS2 ; SNORA64*	-0,407	0,148
665	236190_at	*LOC102723692*	-0,453	0,149
666	225724_at	*FLJ31306*	-0,332	0,149
667	217174_s_at	*APC2*	0,227	0,150
668	205590_at	*RASGRP1*	0,864	0,150
669	220872_at	*PRO2964*	0,432	0,150
670	210809_s_at	*POSTN*	0,522	0,150
671	219393_s_at	*AKT3*	0,316	0,150
672	218253_s_at	*EIF2D*	-0,243	0,150
673	221167_s_at	*CCDC70*	0,442	0,150
674	243766_s_at	*TEAD2*	0,349	0,150
675	218141_at	*UBE2O*	0,658	0,150
676	213415_at	*CLIC2*	0,811	0,150
677	226715_at	*FOXK1*	-0,216	0,150
678	203998_s_at	*SYT1*	-0,594	0,150
679	218983_at	*C1RL*	0,359	0,151
680	241189_at	---	0,369	0,151
681	200765_x_at	*CTNNA1*	0,235	0,151
682	225502_at	*DOCK8*	-0,343	0,151
683	226594_at	*ENTPD5*	-0,250	0,151
684	215499_at	*LOC100996792 ; MAP2K3*	0,397	0,152
685	227572_at	*USP30*	-0,399	0,152
686	215633_x_at	*LST1*	0,668	0,152
687	220829_s_at	*B3GALT1*	0,241	0,152

688	209500_x_at	*TNFSF12-TNFSF13 ; TNFSF13*	0,424	0,152
689	202236_s_at	*SLC16A1*	-0,270	0,152
690	209150_s_at	*IPO4 ; TM9SF1*	-0,253	0,152
691	205050_s_at	*MAPK8IP2*	0,344	0,152
692	213803_at	*KPNB1*	0,254	0,152
693	224060_s_at	*DPH5*	-0,365	0,152
694	210580_x_at	*LOC101929857 ; SLX1A-SULT1A3 ; SLX1B-SULT1A4 ; SULT1A3 ; SULT1A4*	0,346	0,152
695	236215_at	---	0,609	0,152
696	214436_at	*FBXL2*	0,450	0,152
697	224689_at	*MANBAL*	-0,283	0,152
698	212807_s_at	*SORT1*	-0,518	0,152
699	212341_at	*YIPF6*	0,221	0,152
700	231228_at	*BCL2L1*	0,392	0,152
701	232834_at	---	0,256	0,152
702	223100_s_at	*NUDT5*	-0,277	0,152
703	227672_at	*MROH6*	0,290	0,152
704	229578_at	*JPH2*	0,488	0,152
705	225606_at	*BCL2L11*	-0,344	0,152
706	208254_at	---	0,285	0,152
707	209280_at	*MRC2*	0,326	0,152
708	201218_at	*CTBP2*	0,545	0,152
709	217175_at	---	0,322	0,152
710	208822_s_at	*DAP3*	-0,309	0,152
711	225994_at	*CPSF2*	-0,312	0,152
712	203628_at	*IGF1R*	0,598	0,152
713	213418_at	*HSPA6*	0,718	0,152
714	206958_s_at	*UPF3A*	-0,302	0,152
715	214548_x_at	*GNAS*	-0,278	0,152
716	236934_at	---	0,425	0,152
717	52837_at	*KIAA1644*	0,453	0,152
718	202480_s_at	*DEDD*	-0,368	0,152
719	202516_s_at	*DLG1*	-0,311	0,152
720	211678_s_at	*RNF114*	-0,213	0,152
721	240274_at	---	0,332	0,152
722	211270_x_at	*PTBP1*	-0,176	0,152
723	222453_at	*CYBRD1*	0,718	0,152
724	236368_at	*KIAA0368*	0,272	0,152
725	223908_at	*HDAC8*	-0,484	0,152
726	201615_x_at	*CALD1*	0,483	0,152
727	202299_s_at	*LAMTOR5*	-0,199	0,152
728	225117_at	*KANSL1*	-0,222	0,152
729	216383_at	*RPL18AP16 ; RPL18AP16*	-0,388	0,152
730	224304_x_at	*NIN*	-0,407	0,152
731	222290_at	*OR2A20P ; OR2A9P*	0,513	0,152
732	200990_at	*TRIM28*	-0,252	0,153
733	1861_at	*BAD*	-0,233	0,153
734	211181_x_at	*LOC100506403 ; LOC101928269 ; RUNX1*	-0,534	0,153
735	224248_x_at	*FAM192A*	0,252	0,153
736	242311_x_at	---	0,378	0,153
737	49306_at	*RASSF4*	0,534	0,154
738	207220_at	*ART4*	0,481	0,154
739	209073_s_at	*LOC101928143 ; LOC101930388 ; NUMB*	-0,393	0,154
740	220606_s_at	*ADPRM*	-0,476	0,154
741	222360_at	*DPH5*	-0,373	0,154
742	238616_at	*QDPR*	-0,400	0,154
743	231008_at	*UNC5CL*	0,228	0,154
744	201517_at	*NCBP2*	-0,223	0,154
745	217596_at	*UPF3A*	-0,406	0,154
746	219922_s_at	*LTBP3*	-0,612	0,154
747	224589_at	*XIST*	-0,917	0,154
748	227711_at	*GTSF1*	-0,494	0,155
749	200715_x_at	*RPL13A ; SNORD32A ; SNORD33 ; SNORD34 ; SNORD35A*	-0,494	0,155
750	209013_x_at	*TRIO*	0,613	0,155
751	220859_at	---	0,460	0,155
752	232904_at	*SLC7A14*	0,383	0,155
753	234646_at	---	0,423	0,155
754	215963_x_at	*RPL3*	-0,367	0,156
755	209059_s_at	*EDF1*	-0,359	0,156
756	222580_at	*ZNF644*	-0,290	0,156

757	210546_x_at	*CTAG1A ; CTAG1B*	-1,066	0,156
758	211582_x_at	*LST1*	0,614	0,156
759	203310_at	*STXBP3*	-0,263	0,156
760	212994_at	*THOC2*	0,221	0,156
761	205203_at	*PLD1*	-0,311	0,156
762	217466_x_at	*RPS2 ; SNORA64*	-0,482	0,156
763	213574_s_at	*KPNB1*	0,297	0,156
764	205131_x_at	*CLEC11A*	0,567	0,156
765	240524_x_at	---	0,596	0,156
766	217152_at	---	0,516	0,156
767	226245_at	*KCTD1*	-0,232	0,156
768	219030_at	*TPRKB*	-0,230	0,156
769	202764_at	*STIM1*	-0,221	0,156
770	201256_at	*COX7A2L*	-0,179	0,156
771	202262_x_at	*DDAH2*	0,524	0,156
772	235721_at	*DTX3*	-0,454	0,156
773	200647_x_at	*EIF3C ; EIF3CL*	-0,293	0,156
774	212448_at	*NEDD4L*	0,525	0,156
775	201575_at	*SNW1*	-0,191	0,157
776	233337_s_at	*SEZ6L2*	0,713	0,157
777	205683_x_at	*TPSAB1*	0,405	0,157
778	242036_x_at	*ATP2B3*	0,543	0,157
779	219751_at	*SETD6*	0,336	0,158
780	212658_at	*LHFPL2*	0,344	0,158
781	236807_at	---	0,513	0,158
782	214531_s_at	*SNX1*	-0,595	0,158
783	209118_s_at	*TUBA1A*	0,475	0,158
784	204795_at	*PRR3*	-0,509	0,158
785	226787_at	*ZNF18*	0,320	0,158
786	235427_at	*CFLAR*	0,395	0,158
787	236072_at	---	0,411	0,158
788	229004_at	*ADAMTS15*	-0,849	0,158
789	233849_s_at	*ARHGAP5*	-0,391	0,158
790	207201_s_at	*SLC22A1*	0,365	0,158
791	242121_at	---	0,363	0,158
792	237402_at	---	0,451	0,158
793	231111_at	*SCYL3*	0,406	0,158
794	225697_at	*CDK12*	0,315	0,158
795	211261_at	*NUP214*	0,540	0,158
796	211858_x_at	*GNAS*	-0,405	0,158
797	203749_s_at	*RARA*	-0,383	0,159
798	239762_at	*LOC286437*	0,547	0,159
799	213527_s_at	*ZNF688*	0,313	0,159
800	218247_s_at	*MEX3C*	-0,399	0,159
801	210835_s_at	*CTBP2*	0,438	0,159
802	233448_s_at	---	0,371	0,159
803	211558_s_at	*DHPS*	-0,328	0,160
804	215164_at	---	0,470	0,160
805	225921_at	*NIN*	-0,314	0,160
806	217790_s_at	*SSR3*	-0,428	0,160
807	237845_at	*LOC101927552*	0,549	0,160
808	209329_x_at	*HIGD2A*	-0,300	0,160
809	225261_x_at	*NELFCD*	-0,279	0,161
810	210708_x_at	*CASP10*	0,240	0,161
811	241996_at	---	0,254	0,161
812	212364_at	*MYO1B*	0,496	0,161
813	227638_at	*EPG5*	0,199	0,161
814	203299_s_at	*AP1S2*	0,419	0,161
815	200808_s_at	*ZYX*	0,400	0,162
816	207352_s_at	*GABRB2*	0,455	0,162
817	233080_s_at	*PRPF40A*	0,210	0,162
818	211271_x_at	*MIR4745 ; PTBP1*	-0,207	0,162
819	203794_at	*CDC42BPA*	0,548	0,162
820	226647_at	*TMEM25*	-0,418	0,162
821	201113_at	*TUFM*	-0,278	0,162
822	215541_s_at	*DIAPH1*	0,288	0,162
823	239831_at	*TMEM106C*	0,385	0,162
824	200657_at	*SLC25A5*	-0,300	0,162
825	224579_at	*SLC38A1*	-0,422	0,162

826	212952_at	*CTC-425F1.4*	0,276	0,162
827	207374_at	*PLSCR2*	0,434	0,162
828	211710_x_at	*RPL4 ; SNORD16 ; SNORD18A ; SNORD18B ; SNORD18C*	-0,320	0,162
829	237396_at	---	0,467	0,162
830	207170_s_at	*LETMD1*	-0,255	0,162
831	241694_at	*PKHD1*	-0,305	0,162
832	217202_s_at	*GLUL*	0,576	0,162
833	225678_at	*POLR3H*	-0,224	0,162
834	226243_at	*PTRHD1*	-0,391	0,162
835	223457_at	*COPG2*	-0,484	0,162
836	234487_at	---	0,276	0,162
837	233424_at	---	0,516	0,162
838	217606_at	---	0,465	0,162
839	209949_at	*NCF2*	0,532	0,162
840	239861_at	---	0,396	0,162
841	209091_s_at	*SH3GLB1*	-0,362	0,162
842	223335_at	*TMEM69*	-0,293	0,162
843	222444_at	*ARMCX3*	0,296	0,162
844	236004_at	*AP5M1*	-0,311	0,162
845	236923_x_at	---	0,272	0,162
846	230227_at	*RP11-333I13.1*	-0,555	0,162
847	221500_s_at	*STX16*	-0,236	0,162
848	218281_at	*MRPL48*	-0,188	0,163
849	223344_s_at	*MS4A7*	0,445	0,163
850	202562_s_at	*C14orf1*	-0,347	0,163
851	218223_s_at	*PLEKHO1*	0,758	0,164
852	224670_at	*SYS1*	-0,267	0,164
853	214726_x_at	*ADD1*	0,230	0,164
854	226146_at	*HEIH*	-0,288	0,164
855	212266_s_at	*SRSF5*	-0,267	0,164
856	204472_at	*GEM*	0,419	0,164
857	224577_at	*ERGIC1*	-0,392	0,166
858	214902_x_at	*LPP*	0,401	0,166
859	217451_at	*RP11-665C16.8*	0,187	0,166
860	214167_s_at	*RPLP0*	-0,312	0,167
861	209715_at	*CBX5*	0,340	0,167
862	207364_at	*TEX28*	0,155	0,167
863	222229_x_at	*RP13-258O15.1 ; RPL26P37 ; RPL26P37*	-0,289	0,167
864	242593_at	---	0,442	0,167
865	202279_at	*C14orf2*	-0,231	0,167
866	221002_s_at	*TSPAN14*	0,232	0,167
867	216177_at	*RPL29P7 ; RPL29P7*	-0,351	0,167
868	227072_at	*RTTN*	0,241	0,167
869	216140_at	---	0,507	0,167
870	240234_at	---	0,421	0,167
871	200897_s_at	*PALLD*	0,563	0,167
872	215811_at	---	0,425	0,167
873	214173_x_at	*URI1*	-0,253	0,167
874	211971_s_at	*LRPPRC*	-0,193	0,167
875	221428_s_at	*TBL1XR1*	-0,365	0,167
876	221476_s_at	*RPL15*	-0,273	0,167
877	218088_s_at	*RRAGC*	0,192	0,167
878	220713_at	*DENND6B*	0,324	0,167
879	224872_at	*DIP2B*	-0,205	0,168
880	214198_s_at	*DGCR2*	-0,291	0,168
881	214888_at	*CAPN2*	0,303	0,168
882	214186_s_at	*HCG26*	0,483	0,168
883	204528_s_at	*NAP1L1*	-0,278	0,169
884	204334_at	*KLF7*	0,275	0,169
885	225299_at	*MYO5B*	0,281	0,169
886	208855_s_at	*STK24*	-0,214	0,170
887	201622_at	*SND1*	-0,206	0,170
888	238601_at	*PHKB*	0,402	0,170
889	221149_at	*C5AR2*	0,418	0,170
890	211727_s_at	*COX11*	-0,233	0,170
891	228889_at	*ARHGAP5-AS1*	-0,321	0,170
892	222649_at	*XPO4*	-0,231	0,170
893	223007_s_at	*TMEM245*	0,222	0,170
894	217846_at	*MIR6890 ; QARS*	-0,251	0,170

895	63825_at	*ABHD2*	0,344	0,170
896	203196_at	*ABCC4*	0,519	0,171
897	212791_at	*C1orf216*	0,201	0,171
898	215311_at	*NTRK3*	0,498	0,171
899	235575_at	---	0,675	0,171
900	206435_at	*B4GALNT1*	0,427	0,171
901	220647_s_at	*COA4*	-0,258	0,171
902	206761_at	*CD96*	0,439	0,171
903	211487_x_at	*RPS17*	-0,274	0,171
904	209742_s_at	*MYL2*	0,433	0,171
905	203123_s_at	*SLC11A2*	0,280	0,171
906	218825_at	*EGFL7*	0,434	0,171
907	229334_at	*RUFY3*	-0,324	0,172
908	234048_s_at	*EPG5*	0,389	0,172
909	213160_at	*DOCK2*	-0,237	0,172
910	232548_at	*GALNT16*	0,386	0,172
911	225496_s_at	*SYTL2*	0,522	0,172
912	202189_x_at	*MIR4745 ; PTBP1*	-0,194	0,172
913	212851_at	*DCUN1D4*	0,260	0,172
914	214586_at	*GPR37*	0,248	0,172
915	201781_s_at	*AIP*	-0,252	0,172
916	230212_at	*SPRY1*	-0,351	0,172
917	212568_s_at	*DLAT*	-0,261	0,172
918	223526_at	*C18orf21*	-0,216	0,172
919	229060_at	*YPEL2*	0,393	0,172
920	217774_s_at	*TRMT112*	-0,211	0,172
921	219450_at	*C4orf19*	0,377	0,173
922	202514_at	*DLG1*	-0,359	0,173
923	243442_x_at	---	0,296	0,173
924	237795_s_at	*SP2*	0,501	0,173
925	218505_at	*WDR59*	0,257	0,173
926	209132_s_at	*COMMD4*	-0,229	0,173
927	215078_at	*LOC100129518 ; SOD2*	0,405	0,173
928	227328_at	*CAMTA1*	-0,615	0,173
929	202921_s_at	*ANK2*	0,319	0,173
930	210250_x_at	*ADSL*	-0,218	0,173
931	227413_at	*UBLCP1*	-0,394	0,173
932	226430_at	*RELL1*	0,398	0,173
933	209785_s_at	*PLA2G4C*	0,590	0,173
934	206402_s_at	*NPFF*	0,270	0,174
935	200819_s_at	*RPS15*	-0,274	0,174
936	237194_at	---	0,614	0,174
937	233104_at	*PABPC1L*	-0,465	0,174
938	210933_s_at	*FSCN1*	0,413	0,174
939	235041_at	*GOSR2*	0,280	0,174
940	208826_x_at	*HINT1*	-0,274	0,174
941	203386_at	*TBC1D4*	0,423	0,174
942	219699_at	*LGI2*	0,323	0,174
943	211934_x_at	*GANAB*	-0,227	0,174
944	216035_x_at	*TCF7L2*	0,533	0,174
945	234601_x_at	---	0,326	0,174
946	230047_at	*ARHGAP42*	-0,663	0,174
947	200902_at	*42248*	-0,353	0,174
948	201056_at	*GOLGB1*	0,243	0,174
949	219348_at	*USE1*	-0,476	0,174
950	228281_at	*DDIAS*	-0,358	0,174
951	220768_s_at	*CSNK1G3*	-0,346	0,174
952	217757_at	*A2M*	0,652	0,174
953	221173_at	*USH1C*	0,418	0,174
954	203719_at	*ERCC1*	-0,219	0,174
955	203910_at	*ARHGAP29*	0,374	0,174
956	229050_s_at	*SNHG7 ; SNORA17 ; SNORA43*	-0,431	0,174
957	206109_at	*FUT1*	0,408	0,174
958	219739_at	*RNF186*	0,399	0,174
959	217634_at	*SVIL*	0,527	0,174
960	237901_at	---	0,542	0,174
961	202404_s_at	*COL1A2*	0,618	0,174
962	208833_s_at	*ATXN10*	-0,210	0,174
963	226048_at	*MAPK8*	0,251	0,174

964	232241_at	*LINC00894*	-0,532	0,174
965	221524_s_at	*RRAGD*	-0,471	0,175
966	212487_at	*GPATCH8*	0,226	0,175
967	226056_at	*ARHGAP31*	0,397	0,176
968	216894_x_at	*CDKN1C*	0,590	0,176
969	216581_at	*KRT18P38 ; KRT18P38*	0,384	0,176
970	229840_at	*IQSEC2*	0,382	0,176
971	202785_at	*NDUFA7*	-0,380	0,176
972	217866_at	*CPSF7*	-0,185	0,176
973	213321_at	*BCKDHB*	0,383	0,176
974	212109_at	*HN1L*	0,469	0,176
975	200929_at	*TMED10*	-0,335	0,176
976	209058_at	*EDF1*	-0,292	0,176
977	240998_at	---	0,448	0,176
978	227749_at	*POU2F2*	0,302	0,176
979	238692_at	*BTBD11*	-0,469	0,176
980	237549_at	---	0,464	0,176
981	209485_s_at	*OSBPL1A*	0,713	0,176
982	236766_at	---	0,357	0,177
983	203739_at	*ZNF217*	-0,442	0,177
984	215390_at	---	0,418	0,177
985	204144_s_at	*PIGQ*	0,308	0,177
986	201784_s_at	*C11orf58*	-0,237	0,177
987	222810_s_at	*RASAL2*	0,526	0,177
988	213481_at	*S100A13*	0,328	0,177
989	217530_at	*SLC34A1*	0,452	0,177
990	212449_s_at	*LYPLA1*	-0,272	0,177
991	241505_at	---	0,616	0,177
992	243446_at	*AJUBA*	0,566	0,177
993	204129_at	*BCL9*	-0,309	0,177
994	201600_at	*PHB2*	-0,232	0,177
995	213490_s_at	*MAP2K2*	-0,467	0,177
996	216665_s_at	*LOC101929148*	0,324	0,177
997	31874_at	*GAS2L1*	0,435	0,177
998	208003_s_at	*NFAT5*	0,294	0,177
999	203241_at	*UVRAG*	-0,252	0,177
1000	206782_s_at	*DNAJC4*	-0,243	0,177
1001	218774_at	*DCPS*	-0,298	0,177
1002	209009_at	*ESD*	-0,231	0,177
1003	240354_at	*C12orf54*	0,457	0,177
1004	236718_at	*MYO10*	0,461	0,177
1005	219290_x_at	*DAPP1*	0,285	0,178
1006	239859_x_at	*ATP5S*	-0,456	0,178
1007	206206_at	*CD180*	0,685	0,178
1008	219448_at	*TMEM70*	-0,488	0,178
1009	209965_s_at	*RAD51D*	0,261	0,178
1010	203508_at	*TNFRSF1B*	0,550	0,178
1011	215930_s_at	*CTAGE5*	0,287	0,178
1012	204549_at	*IKBKE*	0,240	0,179
1013	224036_s_at	*LMBR1*	-0,406	0,179
1014	206377_at	*FOXF2*	0,298	0,179
1015	237377_at	---	0,466	0,179
1016	230076_at	*PITPNM3*	0,376	0,179
1017	209636_at	*NFKB2*	0,671	0,179
1018	222986_s_at	*SHISA5*	-0,302	0,179
1019	212038_s_at	*VDAC1*	-0,250	0,179
1020	213397_x_at	*RNASE4*	0,527	0,179
1021	211052_s_at	*TBCD*	0,567	0,179
1022	209066_x_at	*UQCRB*	-0,246	0,179
1023	204743_at	*TAGLN3*	0,329	0,179
1024	204546_at	*KIAA0513*	0,635	0,179
1025	220991_s_at	*RNF32*	0,324	0,179
1026	204910_s_at	*TRIM3*	0,276	0,180
1027	233083_at	*MTHFD2L*	0,396	0,180
1028	232247_at	*ZNF502*	-0,305	0,180
1029	216644_at	---	0,450	0,180
1030	226208_at	*ZSWIM6*	-0,319	0,180
1031	216625_at	---	0,366	0,180
1032	201922_at	*NSA2*	-0,285	0,180

1033	202709_at	*FMOD*	0,205	0,180
1034	217773_s_at	*NDUFA4*	-0,287	0,180
1035	210102_at	*VWA5A*	0,428	0,180
1036	216775_at	*USP53*	0,267	0,180
1037	223290_at	*PDXP ; SH3BP1*	-0,377	0,180
1038	224141_at	*FLJ38668*	0,230	0,180
1039	236217_at	*SLC31A1*	0,524	0,180
1040	201919_at	*SLC25A36*	-0,152	0,180
1041	217256_x_at	*RP3-507I15.1*	-0,290	0,180
1042	204232_at	*FCER1G*	0,342	0,180
1043	36865_at	*ANGEL1*	-0,283	0,180
1044	224917_at	*MIR21 ; VMP1*	0,512	0,180
1045	204249_s_at	*LMO2*	0,613	0,180
1046	226313_at	*C10orf35*	0,544	0,180
1047	241584_at	---	0,227	0,180
1048	207476_at	*LOC100507630*	0,192	0,180
1049	242239_at	*NSUN6*	0,290	0,180
1050	210092_at	*MAGOH ; MAGOHB*	-0,296	0,180
1051	225147_at	*CYTH3*	0,566	0,180
1052	211310_at	*EZH1*	0,399	0,182
1053	201516_at	*SRM*	-0,283	0,182
1054	216471_x_at	*SSX2 ; SSX2B*	-0,747	0,183
1055	203197_s_at	*C1orf123*	-0,479	0,183
1056	230611_at	*SYPL2*	0,215	0,183
1057	217983_s_at	*RNASET2*	-0,539	0,183
1058	221973_at	*LOC100506076 ; LOC100506123*	0,414	0,183
1059	222785_x_at	*C11orf1*	-0,370	0,183
1060	201504_s_at	*TSN*	-0,550	0,183
1061	202008_s_at	*NID1*	0,340	0,184
1062	206849_at	*GABRG2*	-0,458	0,184
1063	218972_at	*TTC17*	-0,197	0,184
1064	201828_x_at	*FAM127A*	0,172	0,184
1065	200707_at	*PRKCSH*	-0,297	0,184
1066	203034_s_at	*RPL27A ; SNORA45A*	-0,207	0,184
1067	200799_at	*HSPA1A ; HSPA1B*	0,584	0,184
1068	207721_x_at	*HINT1*	-0,315	0,184
1069	209197_at	*SYT11*	0,403	0,184
1070	205479_s_at	*PLAU*	0,385	0,184
1071	37170_at	*BMP2K*	0,479	0,184
1072	220592_at	*CCDC40*	0,292	0,184
1073	203897_at	*LYRM1*	-0,230	0,184
1074	215830_at	*BC127192 ; SHANK2*	0,342	0,184
1075	228328_at	*KLHL28*	-0,360	0,184
1076	225222_at	*HIAT1*	-0,321	0,185
1077	203561_at	*FCGR2A*	0,478	0,185
1078	222209_s_at	*TMEM135*	-0,436	0,185
1079	211587_x_at	*CHRNA3*	0,352	0,185
1080	208018_s_at	*HCK*	0,482	0,185
1081	221765_at	*UGCG*	0,362	0,185
1082	215588_x_at	*RIOK3*	0,366	0,185
1083	211991_s_at	*HLA-DPA1*	0,743	0,185
1084	222235_s_at	*CSGALNACT2*	-0,372	0,185
1085	201069_at	*MMP2*	0,437	0,185
1086	213947_s_at	*NUP210*	-0,288	0,186
1087	32069_at	*N4BP1*	0,319	0,186
1088	220646_s_at	*KLRF1*	0,444	0,187
1089	229563_s_at	*RPL10A*	-0,267	0,187
1090	227200_at	*ETV3*	-0,290	0,187
1091	242540_at	*DNHD1*	0,394	0,187
1092	213572_s_at	*SERPINB1*	0,279	0,187
1093	212241_at	*GCOM1 ; MYZAP ; POLR2M*	-0,227	0,188
1094	207912_s_at	*DAZ1 ; DAZ2 ; DAZ3 ; DAZ4*	-0,472	0,188
1095	222646_s_at	*ERO1L*	-0,344	0,188
1096	202587_s_at	*AK1*	0,354	0,189
1097	220940_at	*ANKRD36B*	0,501	0,189
1098	213222_at	*PLCB1*	-0,500	0,189
1099	210340_s_at	*CSF2RA*	0,354	0,189
1100	214574_x_at	*LST1*	0,560	0,189
1101	210646_x_at	*RPL13A ; RPL13AP5 ; SNORD32A ; SNORD33 ; SNORD34 ; SNORD35A*	-0,251	0,189

1102	219319_at	*HIF3A*	0,329	0,189
1103	222780_s_at	*BAALC*	-0,224	0,189
1104	212977_at	*ACKR3*	0,488	0,190
1105	205488_at	*GZMA*	0,455	0,190
1106	216515_x_at	*MIR1244-3*	-0,283	0,190
1107	212343_at	*YIPF6*	0,503	0,191
1108	218826_at	*SLC35F2*	-0,352	0,191
1109	243913_at	---	0,262	0,191
1110	236279_at	---	0,529	0,191
1111	215001_s_at	*GLUL*	0,557	0,191
1112	217515_s_at	*CACNA1S*	0,489	0,191
1113	223231_at	*TATDN1*	-0,276	0,191
1114	230560_at	*STXBP6*	-0,646	0,191
1115	227265_at	*FGL2*	0,675	0,191
1116	229108_at	---	-0,244	0,191
1117	200810_s_at	*CIRBP*	-0,315	0,191
1118	223710_at	*CCL26*	-0,387	0,191
1119	224932_at	*CHCHD10*	-0,370	0,191
1120	217654_at	*CFLAR*	0,331	0,191
1121	222791_at	*RSBN1*	-0,260	0,191
1122	241640_at	*BCAP29*	0,472	0,191
1123	225452_at	*MED1*	0,155	0,191
1124	202300_at	*LAMTOR5*	-0,182	0,191
1125	200892_s_at	*TRA2B*	-0,207	0,192
1126	228055_at	*NAPSB*	0,453	0,192
1127	223423_at	*GPR160*	-0,459	0,192
1128	224261_at	---	0,260	0,193
1129	216246_at	---	-0,203	0,193
1130	224395_s_at	*RNF7*	-0,315	0,193
1131	236152_at	*PAGE5*	-0,499	0,193
1132	210371_s_at	*RBBP4*	-0,264	0,193
1133	201954_at	*ARPC1B*	0,294	0,193
1134	243996_at	*RP11-112J3.16*	-0,371	0,193
1135	208986_at	*TCF12*	-0,216	0,193
1136	216449_x_at	*HSP90B1*	0,482	0,193
1137	200689_x_at	*EEF1G ; MIR3654*	-0,242	0,193
1138	243880_at	*GOSR2*	0,538	0,193
1139	223189_x_at	*KMT2E*	-0,184	0,193
1140	229989_at	*FDXACB1*	-0,263	0,193
1141	214421_x_at	*CYP2C9*	0,300	0,193
1142	206093_x_at	*TNXA ; TNXB*	0,575	0,193
1143	243674_at	*LOC102723678 ; LOC102723709*	0,489	0,194
1144	209786_at	*HMGN4*	-0,273	0,194
1145	201362_at	*IVNS1ABP*	0,254	0,194
1146	222789_at	*RSBN1*	-0,188	0,194
1147	201012_at	*ANXA1*	0,670	0,194
1148	205386_s_at	*MDM2*	0,405	0,194
1149	201087_at	*PXN*	0,255	0,194
1150	215668_s_at	*PLXNB1*	-0,403	0,194
1151	221172_at	*C7orf69*	0,384	0,194
1152	239707_at	*SLC5A10*	0,465	0,195
1153	241220_at	---	0,531	0,195
1154	214434_at	*HSPA12A*	0,465	0,195
1155	227498_at	*SOX6*	0,590	0,195
1156	220586_at	*CHD9*	0,324	0,195
1157	213776_at	*LOC157562*	0,495	0,195
1158	219130_at	*TRMT13*	-0,285	0,195
1159	231985_at	*MICAL3*	-0,491	0,195
1160	221225_at	*DCAKD*	0,360	0,195
1161	200986_at	*SERPING1*	0,576	0,195
1162	214572_s_at	*INSL3*	0,421	0,195
1163	207343_at	*LYZL6*	0,324	0,195
1164	226386_at	*MALSU1*	-0,291	0,195
1165	210650_s_at	*PCLO*	0,376	0,195
1166	209411_s_at	*GGA3*	0,240	0,195
1167	236110_at	*ST8SIA5*	0,475	0,195
1168	212924_s_at	*LSM4*	0,325	0,195
1169	239729_at	*RP5-1085F17.3*	-0,496	0,195
1170	214027_x_at	*DES ; SUPT20H*	0,339	0,196

1171	206143_at	*SLC26A3*	0,281	0,196
1172	205361_s_at	*PFDN4*	-0,239	0,196
1173	39313_at	*WNK1*	0,350	0,196
1174	206506_s_at	*SUPT3H*	-0,474	0,196
1175	39835_at	*SBF1*	-0,333	0,196
1176	220447_at	*HRH3*	0,143	0,196
1177	220061_at	*ACSM5*	0,389	0,196
1178	230211_at	*TRIP11*	-0,449	0,197
1179	210722_at	*PNLIPRP1*	0,359	0,197
1180	221698_s_at	*CLEC7A*	0,623	0,197
1181	213992_at	*COL4A6*	-0,465	0,197
1182	213801_x_at	*RPSA ; RPSAP19 ; RPSAP58 ; RPSAP9 ; SNORA6 ; SNORA62*	-0,269	0,197
1183	211328_x_at	*HFE*	0,210	0,197
1184	212256_at	*GALNT10*	0,339	0,197
1185	212923_s_at	*PXDC1*	0,543	0,197
1186	226273_at	*CLCN5*	0,177	0,198
1187	205158_at	*RNASE4*	0,476	0,198
1188	209513_s_at	*HSDL2*	0,396	0,198
1189	215932_at	*MAGEC2*	0,503	0,198
1190	204276_at	*TK2*	0,338	0,198
1191	232940_s_at	*KMT2C*	0,304	0,199
1192	219474_at	*C3orf52*	-0,485	0,199
1193	203621_at	*NDUFB5*	-0,271	0,199
1194	219315_s_at	*TMEM204*	0,272	0,199
1195	235092_at	---	-0,469	0,199
1196	210491_at	---	0,347	0,199
1197	221604_s_at	*PEX16*	-0,380	0,199
1198	202027_at	*TMEM184B*	-0,407	0,199
1199	203146_s_at	*GABBR1*	0,409	0,199
1200	217333_at	*KRT18P44 ; KRT18P44*	0,125	0,199
1201	213067_at	*MYH10*	0,549	0,199
1202	212042_x_at	*RPL7*	-0,219	0,199
1203	219252_s_at	*GEMIN8*	0,271	0,199
1204	232071_at	*MRPL19*	0,454	0,199
1205	201137_s_at	*HLA-DPB1*	0,524	0,199
1206	216316_x_at	*RP11-548H18.2*	0,452	0,199
1207	211164_at	*EPHA3*	0,321	0,199
1208	225865_x_at	*NELFCD*	-0,229	0,199
1209	229796_at	*SIX4*	-0,500	0,199
1210	238433_at	*SNX5*	-0,452	0,200
1211	200910_at	*CCT3 ; LOC101927137*	-0,276	0,200

Supplementary table 7. KEGG gene sets significantly down in bortezomib responders

KEGG pathway	Size gene set	ES	NES	NOM p-val	FDR q-val	FWER p-val
RIBOSOME	**65**	**-0,71**	**-2,93**	**0,000**	**0,000**	**0,000**
OXIDATIVE PHOSPHORYLATION	105	-0,56	-2,56	0,000	0,000	0,000
PARKINSONS DISEASE	104	-0,51	-2,29	0,000	0,000	0,001
HUNTINGTONS DISEASE	163	-0,45	-2,21	0,000	0,001	0,002
PENTOSE PHOSPHATE PATHWAY	26	-0,62	-2,05	0,000	0,002	0,010
ALZHEIMERS DISEASE	147	-0,42	-1,98	0,000	0,004	0,019
CITRATE CYCLE TCA CYCLE	29	-0,54	-1,89	0,003	0,009	0,056
PROTEIN EXPORT	19	-0,57	-1,80	0,008	0,017	0,121
RNA POLYMERASE	28	-0,52	-1,78	0,000	0,019	0,142
RNA DEGRADATION	50	-0,45	-1,75	0,000	0,022	0,186
GLYCOSYLPHOSPHATIDYLINOSITOL GPI ANCHOR BIOSYNTHESIS	23	-0,48	-1,58	0,027	0,074	0,511
N GLYCAN BIOSYNTHESIS	39	-0,41	-1,54	0,021	0,089	0,613
PYRUVATE METABOLISM	39	-0,41	-1,49	0,044	0,116	0,742
AMINOACYL TRNA BIOSYNTHESIS	31	-0,42	-1,46	0,051	0,136	0,828
SPLICEOSOME	92	-0,32	-1,39	0,013	0,198	0,934

Supplementary table 8. Positional gene sets significantly down in bortezomib responders

CHR region	Size gene set	ES	NES	NOM p-val	FDR q-val	FWER p-val
CHR14Q22	36	-0,49	-1,79	0,003	0,050	0,183
CHR11Q13	197	-0,36	-1,79	0,000	0,066	0,183
CHR14Q24	70	-0,42	-1,81	0,000	0,086	0,163
CHR5Q14	32	-0,47	-1,65	0,009	0,102	0,510
CHR15Q23	23	-0,52	-1,69	0,012	0,103	0,411
CHR7P21	29	-0,48	-1,63	0,012	0,108	0,585
CHR15Q14	34	-0,46	-1,65	0,012	0,119	0,510
CHR1P22	**61**	**-0,39**	**-1,56**	**0,011**	**0,156**	**0,756**
CHR14Q13	21	-0,58	-1,82	0,009	0,159	0,151
CHR7P22	41	-0,39	-1,49	0,043	0,197	0,905