Supplement Table 1 Clinical characteristics of lung cancer patients

		Research									**Validate**
		Total	**GSE31210**	**GSE8894**	**GSE30219**	**GSE37745**	**GSE50081**	**GSE3141**	**GSE31908**	**GSE29013**	**GSE157011**
Study		**Number (%)**	**Number (%)**	**Number (%)**	**Number (%)**	**Number (%)**	**Number (%)**	**Number (%)**	**Number (%)**	**Number (%)**	**Number (%)**
Country			**Japan**	**South Korea**	**France**	**Sweden**	**Canada**	**USA**	**USA**	**USA**	**USA**
Sample Size		1251 (100.00)	246 (19.66)	138 (11.03)	307 (24.54)	196 (15.67)	181 (14.16)	111 (8.87)	17 (1.36)	55 (4.40)	482 (100.00)
Age	**Mean ± SD (range)**	62.68 ± 10.17 (13 ~ 89)	59.54 ± 8.08 (30 ~ 89)	60.78 ± 9.58 (13 ~ 82)	61.51 ± 11.58 (15 ~ 84)	63.77 ± 9.18 (39 ~ 84)	68.79 ± 9.4 (40 ~ 88)			63.58 ± 8.73 (32 ~ 76)	68.94 ± 8.63 (43 ~ 92)
Type	**Normal**	35 (2.80)	20 (8.13)		14 (4.56)				1 (5.88)		
	Tumor	1216 (97.20)	226 (91.87)	138 (100.00)	293 (95.44)	196 (100.00)	181 (100.00)	111 (100.00)	16 (94.12)	55 (0.00)	482 (100.00)
Gender	**Male**	716 (63.59)	116 (47.15)	104 (75.36)	250 (85.32)	107 (54.59)	98 (54.14)		3 (17.65)	38 (69.09)	313 (64.94)
	Female	410 (36.41)	130 (52.85)	34 (24.64)	43 (14.68)	89 (45.41)	83 (45.86)		14 (82.35)	17 (30.91)	169 (35.06)
Smoking	**No**	153 (32.08)	123 (50.00)				24 (15.00)		4 (25.00)	2 (3.64)	
	Yes	324 (67.92)	123 (50.00)				136 (85.00)		12 (75.00)	53 (96.36)	
Stage	**1**	612 (63.29)	168 (74.34)		152 (51.88)	130 (66.33)	127 (70.17)		11 (68.75)	24 (43.64)	186 (38.59)
	2	209 (21.61)	58 (25.66)		43 (14.68)	35 (17.86)	54 (29.83)		5 (31.25)	14 (25.45)	247 (51.24)
	3	131 (13.55)			87 (29.69)	27 (13.78)				17 (30.91)	49 (10.17)
	4	15 (1.55)			11 (3.75)	4 (2.04)					
EGFR mutation	**No**	107 (44.21)	99 (43.81)						8 (50.00)		
	Yes	135 (55.79)	127 (56.19)						8 (50.00)		
Histology	**Adenocarcinoma**	713 (57.97)	226 (100.00)	63 (45.65)	85 (27.69)	106 (54.08)	129 (71.27)	58 (52.25)	16 (100.00)	30 (54.55)	
	Squamous cell carcinoma	344 (27.97)		75 (54.35)	82 (26.71)	66 (33.67)	43 (23.76)	53 (47.75)		25 (45.45)	482 (100.00)
	Large cell carcinoma	92 (7.48)			59 (19.22)	24 (12.24)	9 (4.97)				
	Others	81 (6.59)			81 (26.38)						
Relapse	**No**	603 (61.16)	162 (71.68)	69 (50.00)	164 (58.99)	47 (48.96)	126 (71.19)		8 (50.00)	27 (49.09)	
	Yes	383 (38.84)	64 (28.32)	69 (50.00)	114 (41.01)	49 (51.04)	51 (28.81)		8 (50.00)	28 (50.91)	
Survival	**Alive**	545 (50.56)	191 (84.51)		93 (31.74)	51 (26.02)	106 (58.56)	53 (47.75)	14 (87.50)	37 (62.27)	219 (45.44)
	Dead	533 (49.44)	35 (15.49)		200 (68.26)	145 (73.98)	75 (41.44)	58 (52.25)	2 (12.50)	18 (32.73)	263 (54.56)

SD: standard deviation

Supplement Table 2 ROC analysis of gene expression of PD1 and PDL1 for predicting outcome in lung cancer patients

	Gene expression			
	PD1		PDL1	
	AUC (95%CI)	P-value [a]	AUC (95%CI)	P-value [a]
Non-relapse vs. relapse				
Adenocarcinoma stage 1	0.55 (0.48 ~ 0.62)	0.1377	0.54 (0.48 ~ 0.61)	0.2129
Adenocarcinoma stage 2+3+4	0.55 (0.46 ~ 0.65)	0.2565	0.51 (0.42 ~ 0.61)	0.7681
Squamous cell carcinoma stage 1	0.60 (0.49 ~ 0.72)	0.0839	0.59 (0.47 ~ 0.72)	0.1456
Squamous cell carcinoma stage 2+3+4	0.57 (0.43 ~ 0.70)	0.3272	0.59 (0.46 ~ 0.73)	0.1603
Alive vs. death				
Adenocarcinoma stage 1	0.72 (0.67 ~ 0.78)	**<0.0001**	0.74 (0.69 ~ 0.79)	**<0.0001**
Adenocarcinoma stage 2+3+4	0.77 (0.69 ~ 0.84)	**<0.0001**	0.77 (0.69 ~ 0.84)	**<0.0001**
Squamous cell carcinoma stage 1	0.55 (0.44 ~ 0.67)	0.3845	0.59 (0.48 ~ 0.70)	0.0964
Squamous cell carcinoma stage 2+3+4	0.79 (0.68 ~ 0.89)	**<0.0001**	0.78 (0.67 ~ 0.89)	**<0.0001**

ROC: receiver operating characteristic, **AUC**: areas under the ROC curves, **CI**: confidence interval

[a]: P value for Mann-Whitney U test

Bold face: statistical significant (P value<0.05)

Supplement Table 3 PD1 and PDL1 gene Affymetrix probes gene expression at different study

PD1

	Raw data		Quantile normalization by mean		Quantile normalization by Median		Bayes' normalization	
	Mean ± SD	**P-Value [a]**	**Mean ± SD**	**P-Value [a]**	**Mean ± SD**	**P-Value [a]**	**Mean ± SD**	**P-Value [a]**
		<0.0001		<0.0001		<0.0001		**0.9377**
GSE50081	5.37 ± 0.35		66.18 ± 20.51		6.03 ± 0.27		5.32 ± 0.64	
GSE30219	5.69 ± 0.23		64.51 ± 10.6		6.02 ± 0.15		5.32 ± 0.63	
GSE31210	34.76 ± 20.69		15.21 ± 7.89		4.17 ± 0.64		5.32 ± 0.66	
GSE8894	2.33 ± 0.16		7.51 ± 7.05		3.49 ± 0.48		5.32 ± 0.58	
GSE37745	6.80 ± 0.24		79.01 ± 14.72		6.22 ± 0.19		5.32 ± 0.62	
GSE3141	102.39 ± 91.41		18.46 ± 15.31		4.27 ± 0.83		5.31 ± 0.66	
GSE31908	6.25 ± 0.20		47.32 ± 8.2		5.72 ± 0.19		5.32 ± 0.58	
GSE29013	5.34 ± 1.08		45.85 ± 54.47		5.11 ± 1.10		5.32 ± 0.65	

PDL1

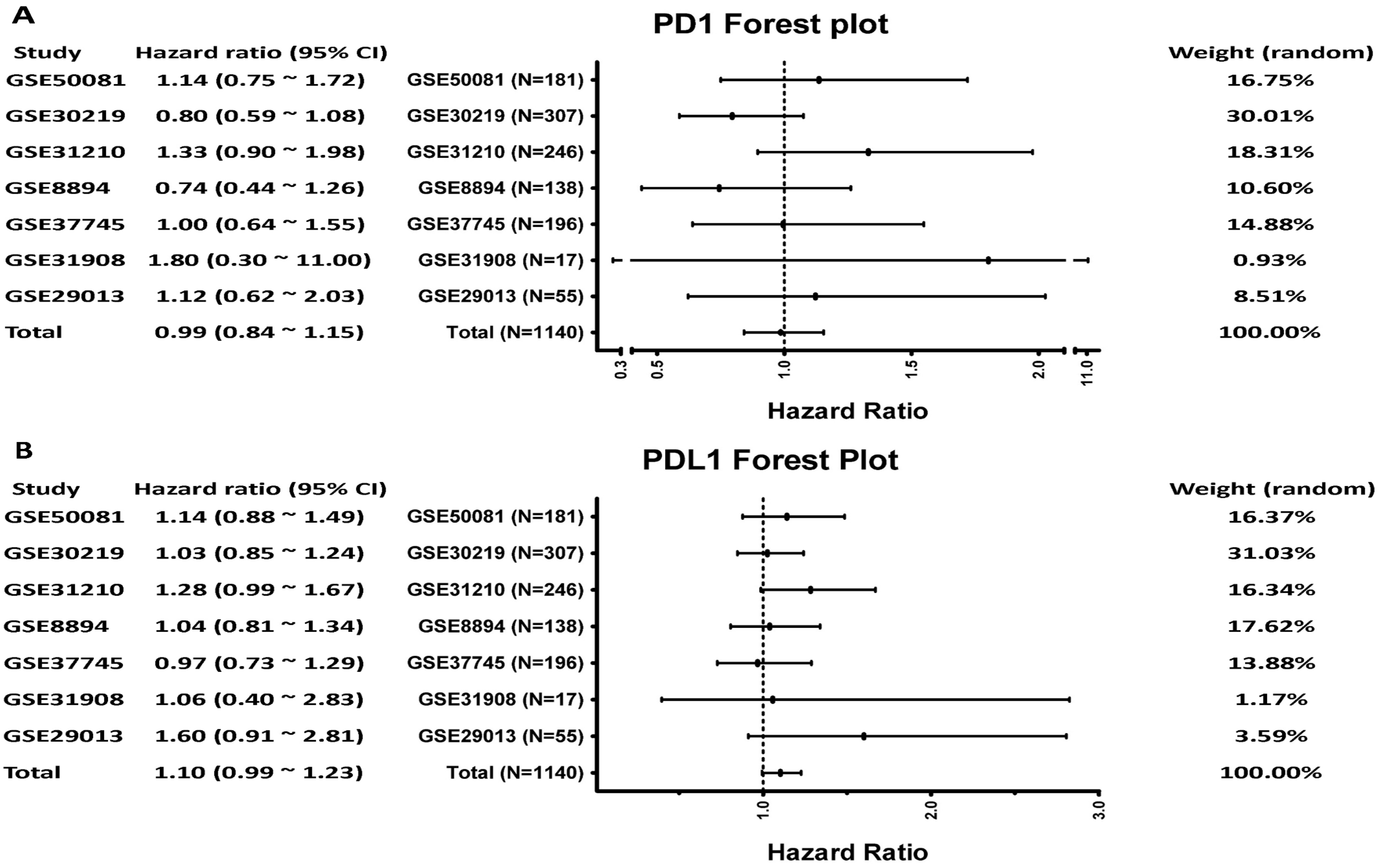
	Raw data		Quantile normalization by mean		Quantile normalization by Median		Bayes' normalization	
	Mean ± SD	**P-Value [a]**	**Mean ± SD**	**P-Value [a]**	**Mean ± SD**	**P-Value [a]**	**Mean ± SD**	**P-Value [a]**
		<0.0001		<0.0001		**0.1297**		**0.3560**
GSE50081	5.35 ± 0.78		92.28 ± 111.50		6.06 ± 0.70		6.67 ± 0.93	
GSE30219	5.92 ± 1.02		120.52 ± 155.33		6.26 ± 0.95		6.67 ± 0.97	
GSE31210	628.08 ± 429.63		180.15 ± 112.16		6.82 ± 0.56		6.67 ± 0.89	
GSE8894	4.26 ± 1.45		150.85 ± 207.27		6.10 ± 1.21		6.67 ± 0.95	
GSE37745	7.22 ± 0.97		175.99 ± 193.27		6.73 ± 0.96		6.67 ± 0.96	
GSE3141	689.58 ± 508.63		193.57 ± 174.07		6.92 ± 0.89		6.67 ± 0.84	
GSE31908	6.47 ± 0.28		75.46 ± 24.18		5.90 ± 0.33		6.66 ± 0.76	
GSE29013	6.97 ± 0.75		222.37 ± 182.97		7.17 ± 1.10		6.67 ± 0.70	

SD: standard deviation

[a]: P-value for homogeneity Levene's Test

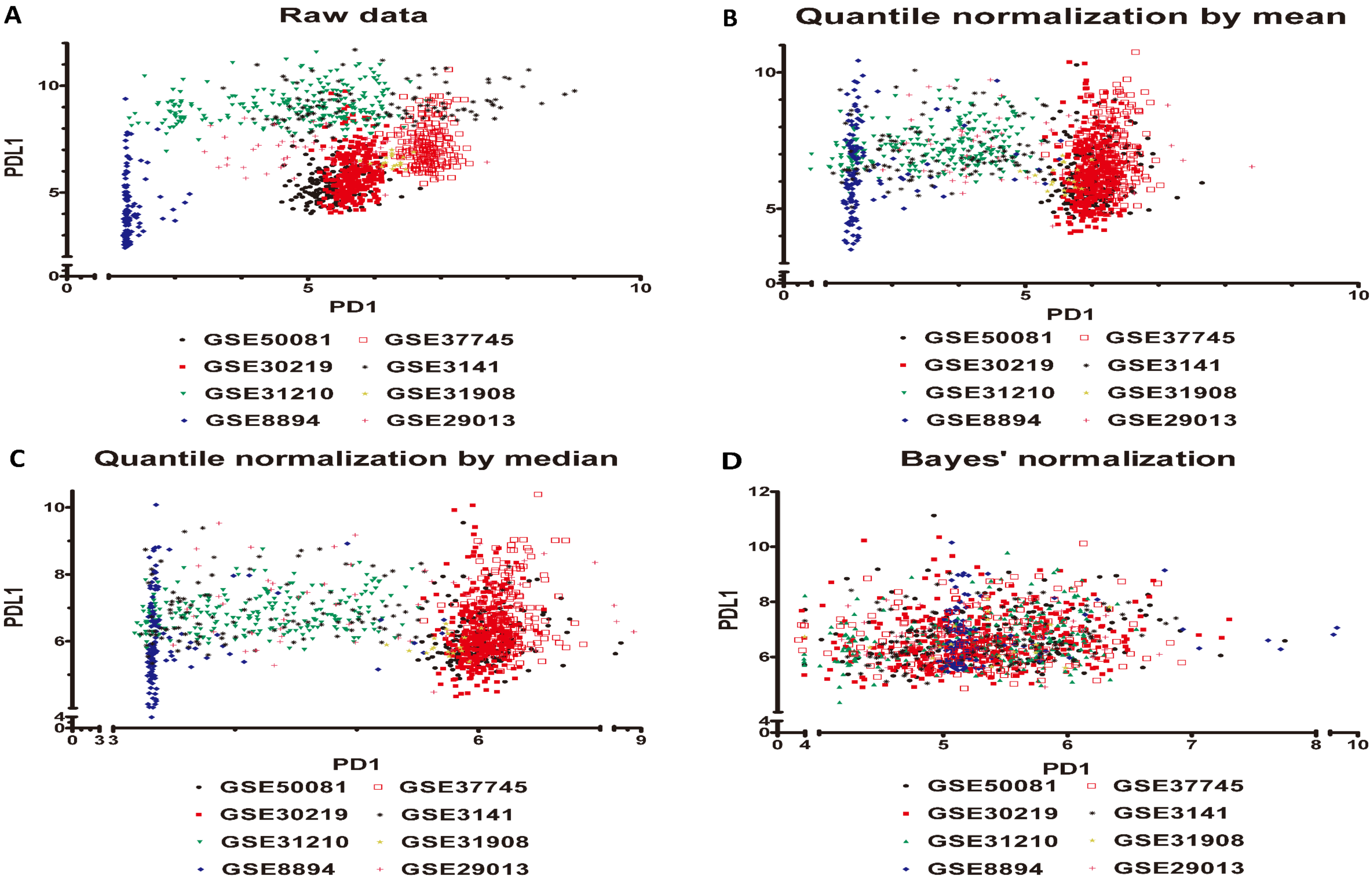
Bold face: statistical significant (P value > 0.05)

Supplement Figure 1 PD1 and PDL1 gene expression forest plot



Meta-analyses random effects model forest plot in PD1 (A), PDL1 (B).

Supplement Figure 2 PD1 and PDL1 gene expression in different normalized methods



Scatter plot of PD1 and PDL1 gene expression in raw data(A), quantile normalization by mean (B), quantile normalization by median (C), and Bayes’ normalization (D).