

Supplementary Materials

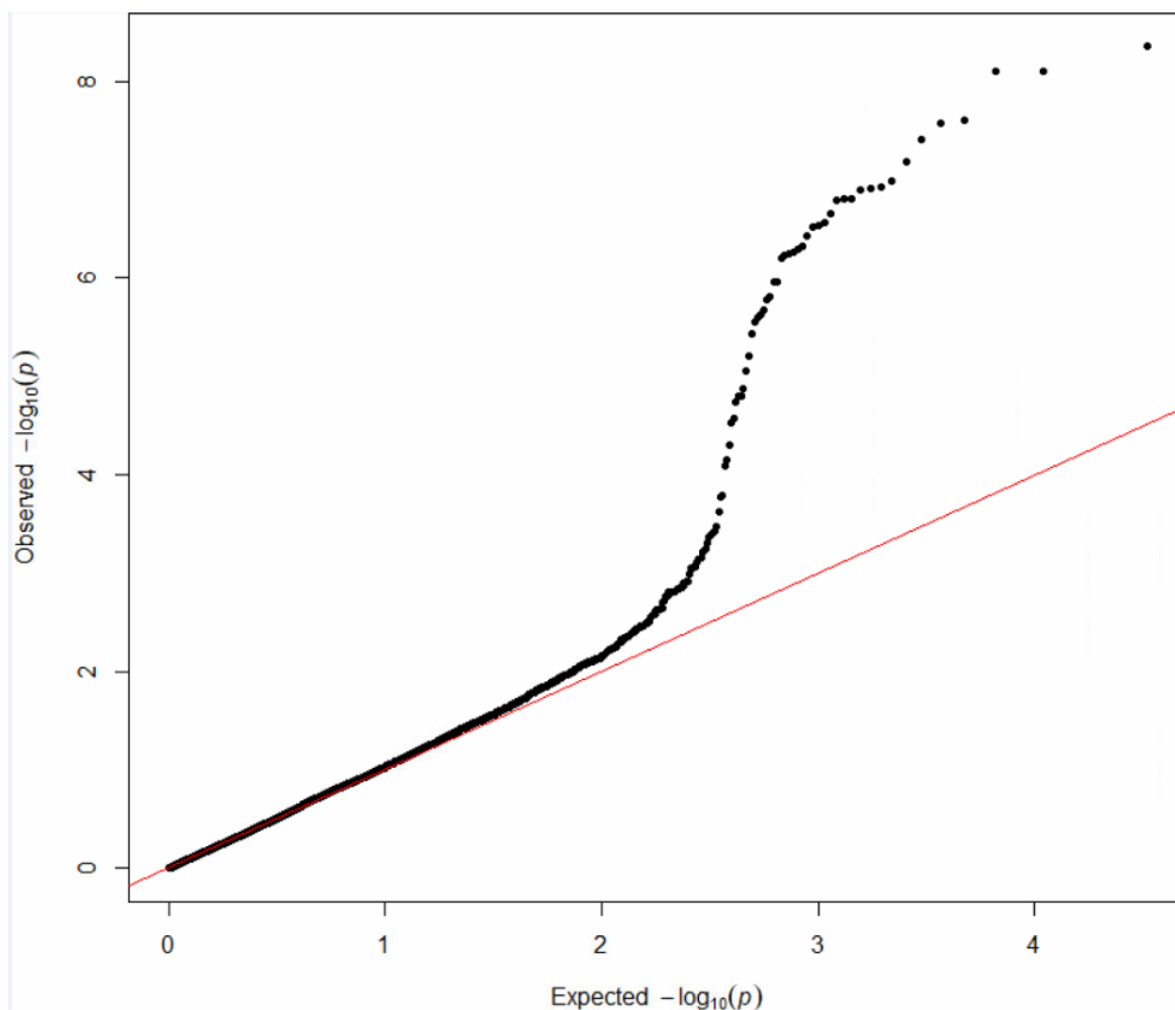


Figure S1. Quantile–quantile plot for Parkinson’s disease.

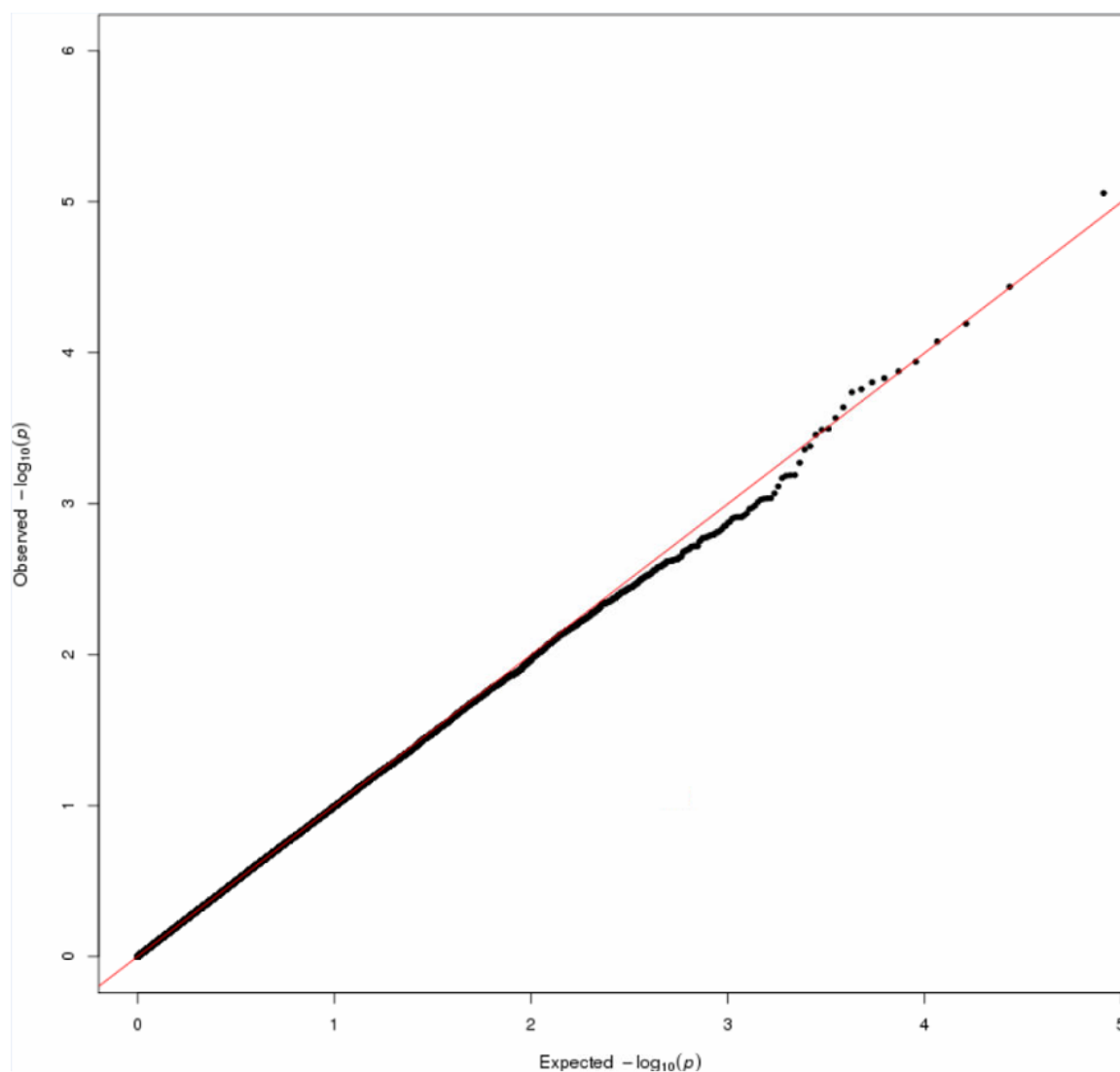


Figure S2. Quantile–quantile plot for dementia in Parkinson's disease.

Table S1. Characteristics of the markers used in the microarray.

Source	Not Design	Design	Submit	Design Rate (%)
AD (PMID:30820047)	689	244	933	26.2
AD_IGAP	9754	6474	16,228	39.9
ADPD_cRE	5412	533	5945	9.0
DLB (PMID:31065058)	2	1	3	33.3
ENDOSOME	451	714	1165	61.3
GWAS_cat_AD	2827	2319	5146	45.1
GWAS_cat_DM	484	332	816	40.7
GWAS_cat_PD	1356	1183	2539	46.6
GWAS_cat_T2D	6248	5261	11,509	45.7
KEGG_LYSOSOME	946	1289	2235	57.7
KEGG_TOLL_LIKE_RECEPTOR_SIGNALING_PATHWAY	817	1166	1983	58.8
MITOCHONDRION	2389	3458	5847	59.1
NEURON_DEVELOPMENT	423	715	1138	62.8
PD (Nall_2019_Biorxiv)	663	615	1278	48.1

PD (PMID:28892059)	6	6	12	50.0
PD_Foo	3681	3604	7285	49.5
PD_Nall	13158	10,132	23,290	43.5
REACTOME_ACTIVATION_OF_NF_KAPPAB_IN_B_CELLS	378	545	923	59.0
SLEEP	142	282	424	66.5
SLEEP (PMID:18820697)	3	6	9	66.7
SLEEP (PMID:19412176)	5	5	10	50.0
SLEEP (PMID:21170044)	4	3	7	42.9
SLEEP (PMID:22257907)	7	4	11	36.4
SLEEP (PMID:26507264)	34	50	84	59.5
SLEEP (PMID:29535854)	139	107	246	43.5
T2D (PMID:30718926)	9	2	11	18.2
T2D_Xue	9223	8059	17,282	46.6
UBIQUITIN_CYCLE	262	426	688	61.9
Other_GWAS_cat	50,292	61,726	112,018	55.1
Total	109,804	109,261	219,065	49.9

Table S2. Staged verification of the markers.

Step-by-step Marker Check for Tagging			
Steps	Description	Number of Markers	Number of QC Marker
Step0	Raw	219,065	-
Step1	Remove duple Marker	179,344	39,721
Step2	1000genome	165,822	13,522
Step3	MAF = 0	151,641	14,181
Step4	Tagging r^2 0.8	59,920	91,721
Tagging SNP Coverage			
Step4	Tagging r^2 0.8	59,920	14,811
Step5-1	independent Marker	45,109	-
Step6-1	Design Possible	32,379	12,730
Step5-2	Non Independent Group	14,807	-
Step6-2	Design Possible Group	13,880	927
Step7	Final Tagging SNP	46,259	-

Table S3. Additional selection according to selection priority.

	Description	Number of Markers	Cumulative Numbers	Priority
Step0	Tagging SNP	46,259	46,259	Top
Step1	Priority1 Uniq Marker	12,088	58,347	Middle
Step2	Priority2 Uniq Marker	15,210	73,557	Bottom
Step3	Includes markers of interest and multi-allelic markers	667	74,224	Top