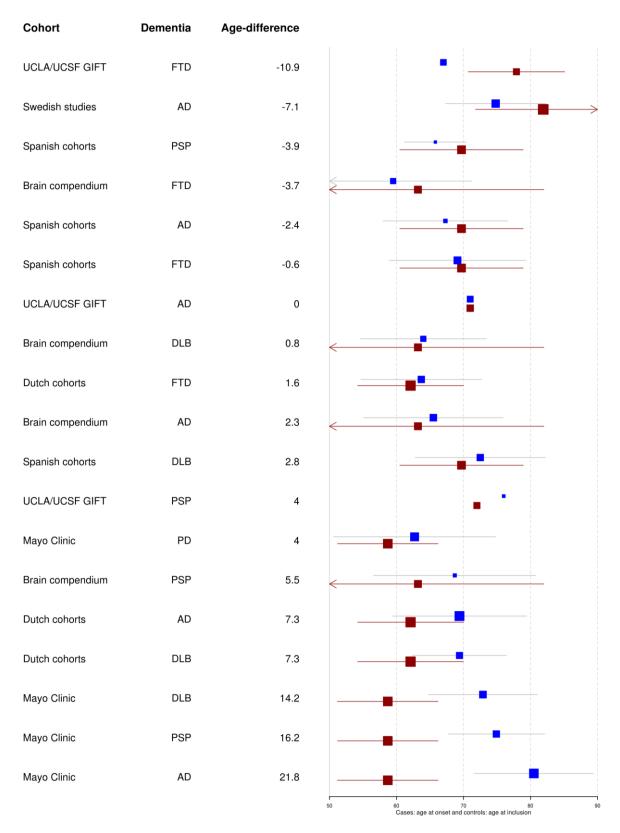
Content: Supplementary Figures 1-10



Supplementary Figure 1: Average age of cases (blue) and controls (red) in cohorts. Wiskers show the standard deviation of the average age. Cohorts are ordered by the difference in age between cases and controls. Most cohort have controls of the same age or lower than the cases.

Study	N-cases	N-controls	MAF-cases	MAF-controls	Odds-ratio	p-value		
UCLA/UCSF GIFT	224	249	0.00	2.01	0.00 [0.00-Inf]	0.982	-	
NDRU cohort	527	343	0.66	1.17	0.56 [0.20-1.57]	0.272		
Brain compendium	277	362	0.00	0.83	0.00 [0.00-Inf]	0.979	-	>
Spanish cohorts	23	746	0.00	0.67	0.00 [0.00-Inf]	0.991		
Swedish studies	564	3480	0.53	0.88	0.60 [0.26-1.40]	0.239		
MAYO	1477	1487	0.64	0.98	0.66 0.37-1.17	0.155		-
Amsterdam UMC	1893	2571	0.63	1.24	0.50 [0.31-0.81]	0.004		
Combined OR	4985	9238	0.56	1.02	0.57 [0.41-0.78]	0.000		
							0.01 0.5 1	1.5

ΔD

Supplementary Figure 2: Alzheimer's Disease (AD) cohort-specific associations of rs72824905-G. Numbers (N) of AD patients and controls studied. MAF = minor allele frequency. The figure shows the odds-ratio (box) of the rs72824905-G with the 95% confidence intervals (whiskers) per study. The combined OR and 95% confidence interval is shown as a triangle.

				DLB			
Study	N-cases	N-controls	MAF-cases	MAF-controls	Odds-ratio	p-value	
NDRU cohort	622	343	0.64	1.17	0.55 [0.20-1.47]	0.230	
Brain compendium	97	362	0.52	0.83	0.62 [0.07-5.20]	0.658	⊢→
Spanish cohorts	232	746	0.65	0.67	0.96 [0.26-3.53]	0.956	⊢ ■ →
MAYO	306	1487	0.33	0.98	0.33 [0.08-1.39]	0.132	F
Amsterdam UMC	189	2571	0.53	1.24	0.42 [0.10-1.73]	0.228	H
Combined OR	1446	5509	0.55	1.06	0.54 [0.30-0.99]	0.045	
							0.01 0.5 1 1.5 2 2.5

Supplementary Figure 3: Dementia with Lewy-bodies (DLB) cohort-specific associations of rs72824905-G. Numbers (N) of DLB patients and controls studied. MAF = minor allele frequency. The figure shows the odds-ratio (box) of the rs72824905-G with the 95% confidence intervals (whiskers) per study. The combined OR and 95% confidence interval is shown as a triangle.

				FID			
Study	N-cases	N-controls	MAF-cases	MAF-controls	Odds-ratio	p-value	
RiMod-FTD	255	1660	0.59	1.17	0.51 [0.16-1.63]	0.254	 1
IFGC	1360	5059	0.81	1.17	0.69 [0.44-1.09]	0.111	
UCLA/UCSF GIFT	132	249	0.76	2.01	0.41 [0.09-1.80]	0.239	· · · · · · · · · · · · · · · · · · ·
Brain compendium	93	362	1.08	0.83	1.30 [0.26-6.57]	0.748	⊢ ■ →
Spanish cohorts	366	746	0.14	0.67	0.20 [0.03-1.58]	0.127	· · · · · · · · · · · · · · · · · · ·
Amsterdam UMC	231	2571	0.22	1.24	0.17 [0.02-1.23]	0.080	·
Combined OR	2437	10647	0.64	1.16	0.61 [0.41-0.89]	0.011	
							0.01 0.5 1 1.5 2 2.5

ETD

Supplementary Figure 4: Frontal Temporal Dementia (FTD) cohort-specific associations of rs72824905-G. Numbers (N) of FTD patients and controls studied. MAF = minor allele frequency. The figure shows the odds-ratio (box) of the rs72824905-G with the 95% confidence intervals (whiskers) per study. The combined OR and 95% confidence interval is shown as a triangle.

				PSP			
Study	N-cases	N-controls	MAF-cases	MAF-controls	Odds-ratio	p-value	
UCLA/UCSF GIFT	12	249	0.00	2.01	0.00 [0.00-Inf]	0.991	•
NDRU cohort	613	343	0.90	1.17	0.77 [0.30-1.92]	0.569	· · · · · · · · · · · · · · · · · · ·
Brain compendium	17	362	2.94	0.83	3.71 [0.42-32.66]	0.238	\vdash
Spanish cohorts	9	746	0.00	0.67	0.00 [0.00-Inf]	0.992	•
MAYO	231	1487	1.95	0.98	2.04 [0.95-4.36]	0.067	⊢ ≣ →
Combined OR	882	3187	1.19	0.99	1.46 [0.83-2.58]	0.186	0.01 0.5 1 1.5 2 2.5

Supplementary Figure 5: Progressive Supranuclear Palsy (PSP) cohort-specific associations of rs72824905-G. Numbers (N) of PSP patients and controls studied. MAF = minor allele frequency. The figure shows the odds-ratio (box) of the rs72824905-G with the 95% confidence intervals (whiskers) per study. The combined OR and 95% confidence interval is shown as a triangle.

				ALS			
Study	N-cases	N-controls	MAF-cases	MAF-controls	Odds-ratio	p-value	
stratum s1 stratum s2 stratum s3 stratum s4 stratum s6 stratum s8 stratum s10 stratum s10 stratum s11 stratum s13 stratum s14 stratum s15 stratum s15 stratum s18 stratum s21 stratum s21 stratum s22 stratum s23 stratum s24 stratum s25 stratum s26 stratum s27	423 299 145 288 168 308 614 266 382 952 518 290 203 205 264 559 327 1032 1399 1715 596	$\begin{array}{c} 420\\ 317\\ 4882\\ 268\\ 159\\ 331\\ 2687\\ 513\\ 244\\ 1829\\ 258\\ 93\\ 221\\ 242\\ 443\\ 2003\\ 1005\\ 2502\\ 648\\ 1075\\ 533\end{array}$	$\begin{array}{c} 0.84\\ 1.25\\ 1.29\\ 0.48\\ 0.81\\ 0.50\\ 1.34\\ 0.66\\ 1.42\\ 0.70\\ 0.65\\ 1.04\\ 0.89\\ 0.42\\ 0.02\\ 0.71\\ 0.93\\ 0.81\\ 1.05\\ 0.82\\ 1.43\end{array}$	0.74 0.76 1.03 0.41 1.32 0.57 0.78 0.95 0.28 0.97 1.39 1.57 1.50 1.04 0.87 0.87 0.87 0.87 0.87 1.21 0.73 0.94 1.19 1.18	$\begin{array}{c} 1.15 \\ [0.36-3.68] \\ 1.86 \\ [0.52-6.69] \\ 1.44 \\ [0.48-4.36] \\ 0.81 \\ [0.12-5.71] \\ 0.56 \\ [0.10-2.97] \\ 0.85 \\ [0.16-4.41] \\ 1.73 \\ [0.95-3.16] \\ 0.65 \\ [0.17-2.46] \\ 10.48 \\ [1.11-98.64] \\ 0.73 \\ [0.38-1.41] \\ 0.42 \\ [0.14-1.30] \\ 0.60 \\ [0.13-2.86] \\ 0.44 \\ [0.09-1.84] \\ 0.35 \\ 10.5-2.32 \\ 0.00 \\ [0.00-550327.04] \\ 0.81 \\ [0.35-1.84] \\ 0.68 \\ 0.26-1.81] \\ 1.14 \\ 0.61-2.12 \\ 0.96 \\ [0.39-2.34] \\ 0.62 \\ [0.35-1.12] \\ 1.22 \\ [0.59-2.51] \\ \end{array}$	$\begin{array}{c} 0.8170\\ 0.3324\\ 0.5347\\ 0.8363\\ 0.4859\\ 0.8452\\ 0.0846\\ 0.5102\\ 0.0080\\ 0.3465\\ 0.1333\\ 0.5346\\ 0.2379\\ 0.2457\\ 0.0034\\ 0.5987\\ 0.4279\\ 0.4279\\ 0.6850\\ 0.9229\\ 0.1184\\ 0.5950\end{array}$	
Combined OR	10953	20673	0.89	0.93	1.07 [0.87-1.33]	0.5187	

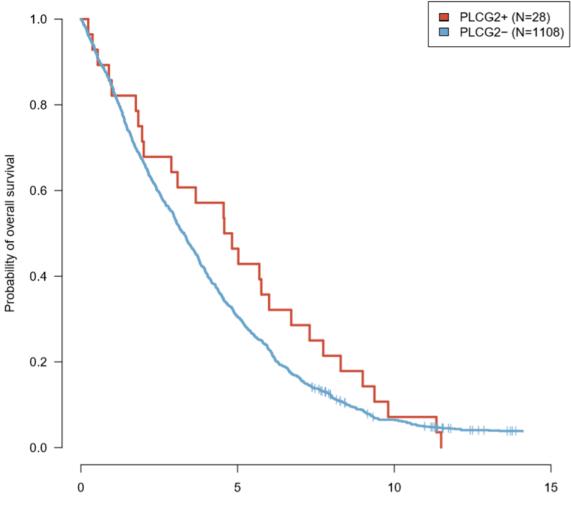
Supplementary Figure 6: Amyotrophic Lateral Sclerosis (ALS) **c**ohort-specific associations of rs72824905-G. Numbers (N) of ALS patients and controls studied. MAF = minor allele frequency. The figure shows the odds-ratio (box) of the rs72824905-G with the 95% confidence intervals (whiskers) per study. The combined OR and 95% confidence interval is shown as a triangle.

				PD			
Study	N-cases	N-controls	MAF-cases	MAF-controls	Odds-ratio	p-value	
MAYO clinic PD IPDGC	853 27595	1487 106951	1.06	0.98	1.08 [0.60-1.96] 1.20 [0.97-1.48]	0.791 0.094	
Combined OR	28448	108438			1.18 [0.97-1.44]	0.095	

Supplementary Figure 7: Parkinson's Disease (PD) cohort-specific associations of rs72824905-G. Numbers (N) of PD patients and controls studied. MAF = minor allele frequency. The figure shows the odds-ratio (box) of the rs72824905-G with the 95% confidence intervals (whiskers) per study. The combined OR and 95% confidence interval is shown as a triangle.

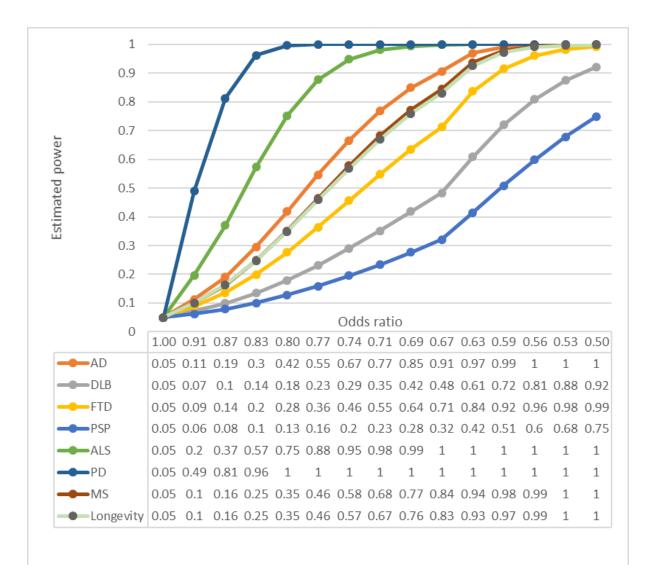
				Longevity			
Study	N-cases	N-controls	MAF-cases	MAF-controls	Odds-ratio	p-value	
GBC	770	2709	1.04	0.83	1.26 [0.71-2.24]	0.438	F
LLS	1138	743	1.23	0.74	1.68 [0.83-3.39]	0.149	
AgeCoDe	462	861	1.52	1.16	1.31 [0.66-2.63]	0.440	F
Danish studies	853	2793	0.59	0.59	0.99 [0.49-2.02]	0.983	·
Amsterdam UMC	293	2571	2.73	1.24	2.26 [1.29-3.97]	0.004	⊢ I
Combined OR	3516	9677	1.19	0.89	1.49 [1.12-1.98]	0.006	

Supplementary Figure 8: Longevity cohort-specific associations of rs72824905-G. Numbers (N) of long-lived individuals and controls studied. MAF = minor allele frequency. The figure shows the odds-ratio (box) of the rs72824905-G with the 95% confidence intervals (whiskers) per study. The combined OR and 95% confidence interval is shown as a triangle.



Follow-up time [years]

Supplementary Figure 9: Survival after the age of 90 years of rs72824905-G carriers vs. non-carriers. A Kaplan-Meier curves are shown. Whiskers show individuals that were censored.



Supplementary figure 10: Power analysis for Alzheimer's disease (AD), Frontotemporal Dementia (FTD), dementia with Lewy-bodies (DLB), Progressive Supranuclear Palsy (PSP), Parkinson's Disease (PD) Amyotrophic Lateral Sclerosis (ALS) and Multiple Sclerosis (MS). Statistical power of our analysis to attain a *p*-value of 0.05 is shown for the odds ratios (ORs) between 0.50 and 1. We used the total number of cases and controls from our analysis. We assumed an additive model, a minor allele frequency of 0.009 and a disease frequency of 0.01 for all diseases. The table shows the exact estimates of statistical power.