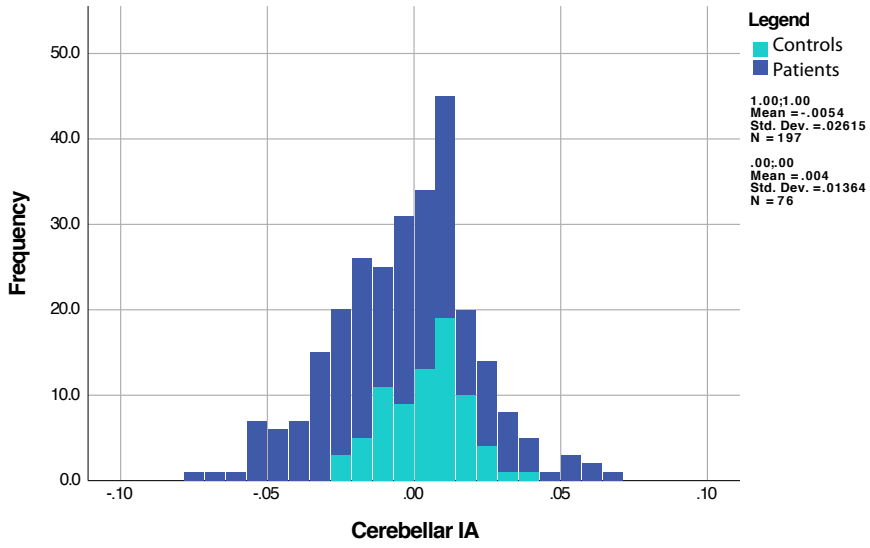
SUPPLEMENTARY MATERIAL

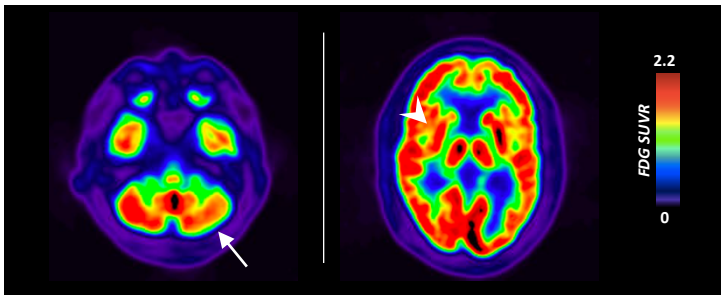
	^{18}F-FDG to ^{18}F-FTP	^{18}F-FDG to ^{11}C-PIB	^{18}F-FTP to ^{11}C-PIB
Absolute interval in days *Mean (SD)* *[min-max]*	36.6 (154.8) [1-1622]	13.8 (30.9) [0-183]	22.8 (153.7) [0-1622]
Patients with both scans on the same day	0/117	25/117	92/117

Supplementary Table 1. Interval between ^{18}F-FDG, ^{18}F-Flortaucipir (FTP) and ^{11}C-PIB PET scans

A.



B.



Supplementary Figure 1. (A) Distribution of ^{18}F-FDG cerebellar IA in controls (n=76) and patients (n=197) (B) 2 controls that were excluded due to significant asymmetry in cerebellar metabolism (arrow) or basal ganglia (arrowhead), likely due to vascular disease.

Absolute cortical IA	^{18}**F-FDG** (n=197)	^{11}**C-PIB** (n=117)	^{18}**F-FTP** (n=117)
Mean	4.9 %	3.1 %	6.4 %
SD	4.0 %	3.6 %	6.7 %
Min	0.0 %	0.0 %	0.0 %
Max	18.0 %	19.4 %	38.6 %

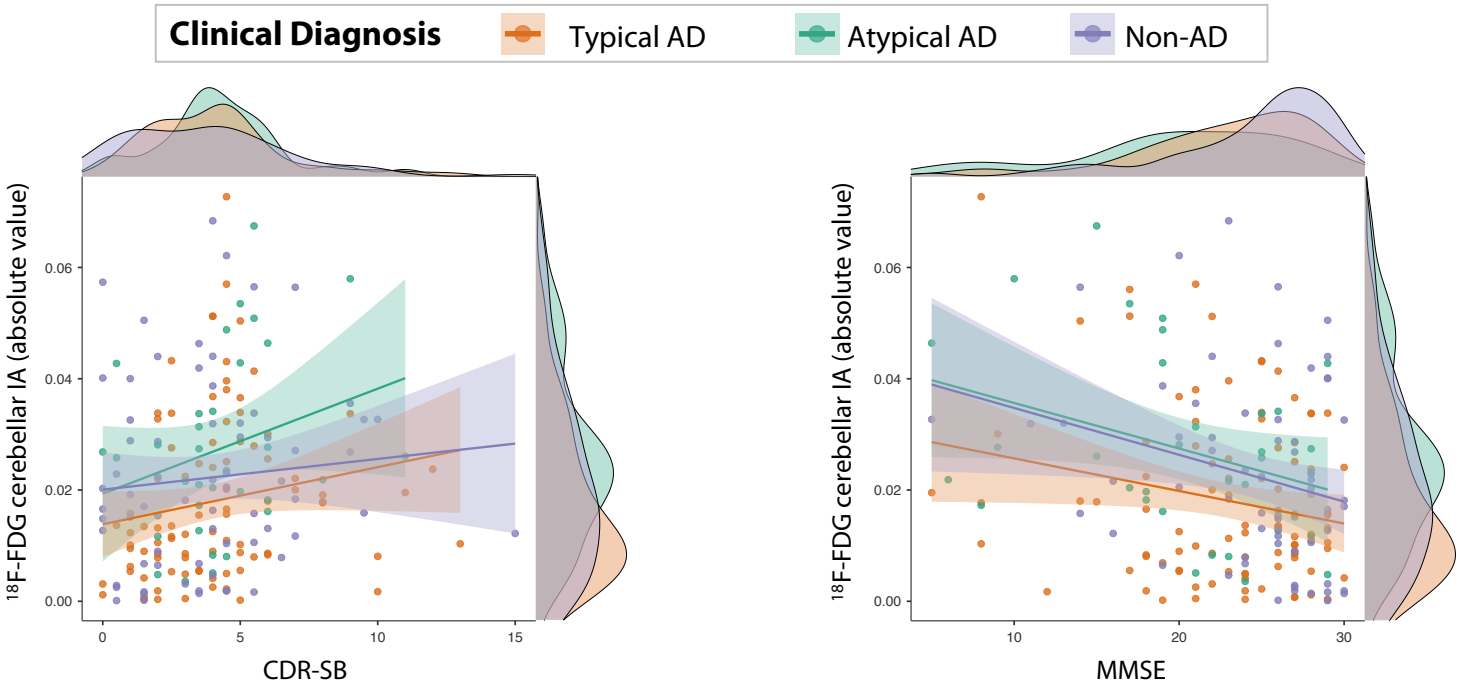
Supplementary Table 2. Distribution of absolute cortical index of asymmetry (IA) for each modality

Patients (n=197)	Parietal	Frontal	Temporal	Occipital	Basal ganglia
Cerebellar	-.725*	-.743*	-.613*	-.506*	-.617*
Parietal		.827*	.876*	.788*	.655*
Frontal			.780*	.540*	.729*
Temporal				.760*	.648*
Occipital					.434*

Controls (n=74)	Parietal	Frontal	Temporal	Occipital	Basal ganglia
Cerebellar	-.161	.066	.146	.001	.005
Parietal		.691*	.570*	.488*	.397†
Frontal			.650*	.329†	.349†
Temporal				.388†	.508*
Occipital					.289†

Supplementary Table 3. Relationship between regional ^{18}F-FDG IA and cerebellar ^{18}F-FDG IA in the whole patient cohort (top) and in controls (bottom)

Pearson's correlation coefficients are shown;
** p< .001*
† p< .01



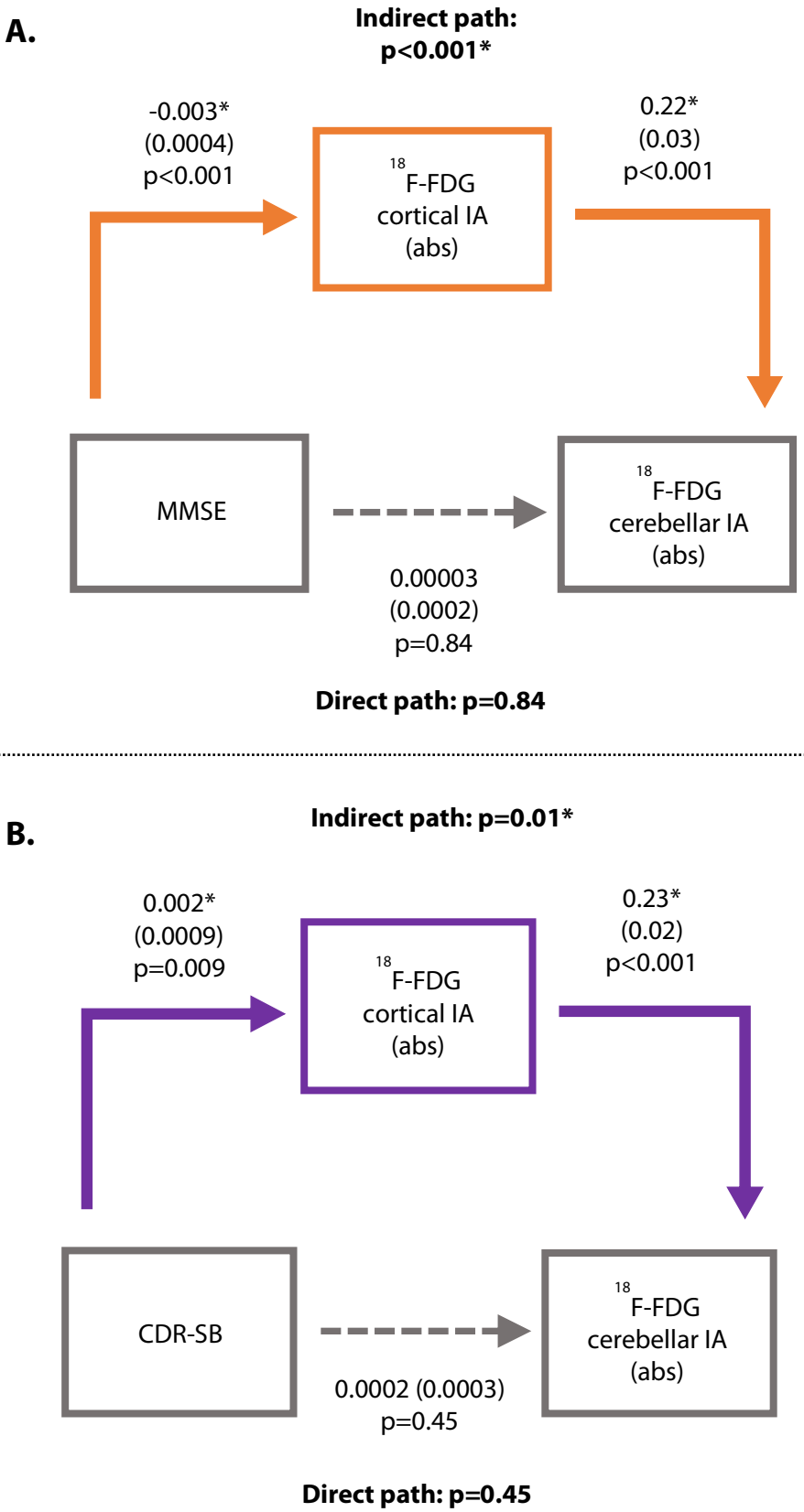
	F	dof	p	η_p^2
Clinical Dx	4.14	2	0.017	0.043
CDR-SB	5.09	1	0.025	0.027
Clinical Dx * CDR-SB	0.49	2	0.62	0.005

Full model: $R^2 = 0.072$, $F = 2.88$ (dof = 5), $p = 0.016$

	F	dof	p	η_p^2
Clinical Dx	3.56	2	0.03	0.037
MMSE	12.7	1	$< 10^{-3}$	0.064
Clinical Dx * MMSE	0.19	2	0.83	0.002

Full model: $R^2 = 0.107$, $F = 4.43$ (dof = 5), $p < 10^{-3}$

Supplementary Figure 2. Relationship between ^{18}F-FDG cerebellar IA, CDR-SB (left) and MMSE (right) by clinical diagnosis.
Relationship between disease severity (CDR-SB or MMSE) and cerebellar asymmetry on ^{18}F-FDG was still significant when controlling for clinical diagnosis (coded as typical AD, atypical AD and non-AD). No interaction was seen between disease severity and clinical group.



Supplementary Figure 3. Mediation analyses between ^{18}F-FDG cerebellar IA, MMSE (A) and CDR-SB (B) (n=197)

	CCD (n=47)	No CCD (n=146)	p value
Act. tremor UL	15/46 (33%)	41/141 (29%)	p= .65
Asymmetry	5/46 (11%)	13/141 (9%)	p= .74
Act. tremor LL	0/46 (0%)	0/141 (0%)	p= 1.0
Asymmetry	0/46 (0%)	0/141 (0%)	p= 1.0
Pron. Sup.	14/46 (30%)	39/140 (28%)	p= .74
Asymmetry	7/46 (15%)	18/140 (13%)	p= .69
Fing. Nose	5/46 (11%)	11/141 (8%)	p= .56
Asymmetry	4/46 (9%)	6/141 (4%)	p= .25
Heel to shin	2/21 (10%)	0/38 (0%)	p= .06
Asymmetry	0/21 (0%)	0/38 (0%)	p= 1.0
Tandem walk	16/45 (36%)	47/138 (34%)	p= .86
Ataxic gait	0/45 (0%)	0/141 (0%)	p= 1.0

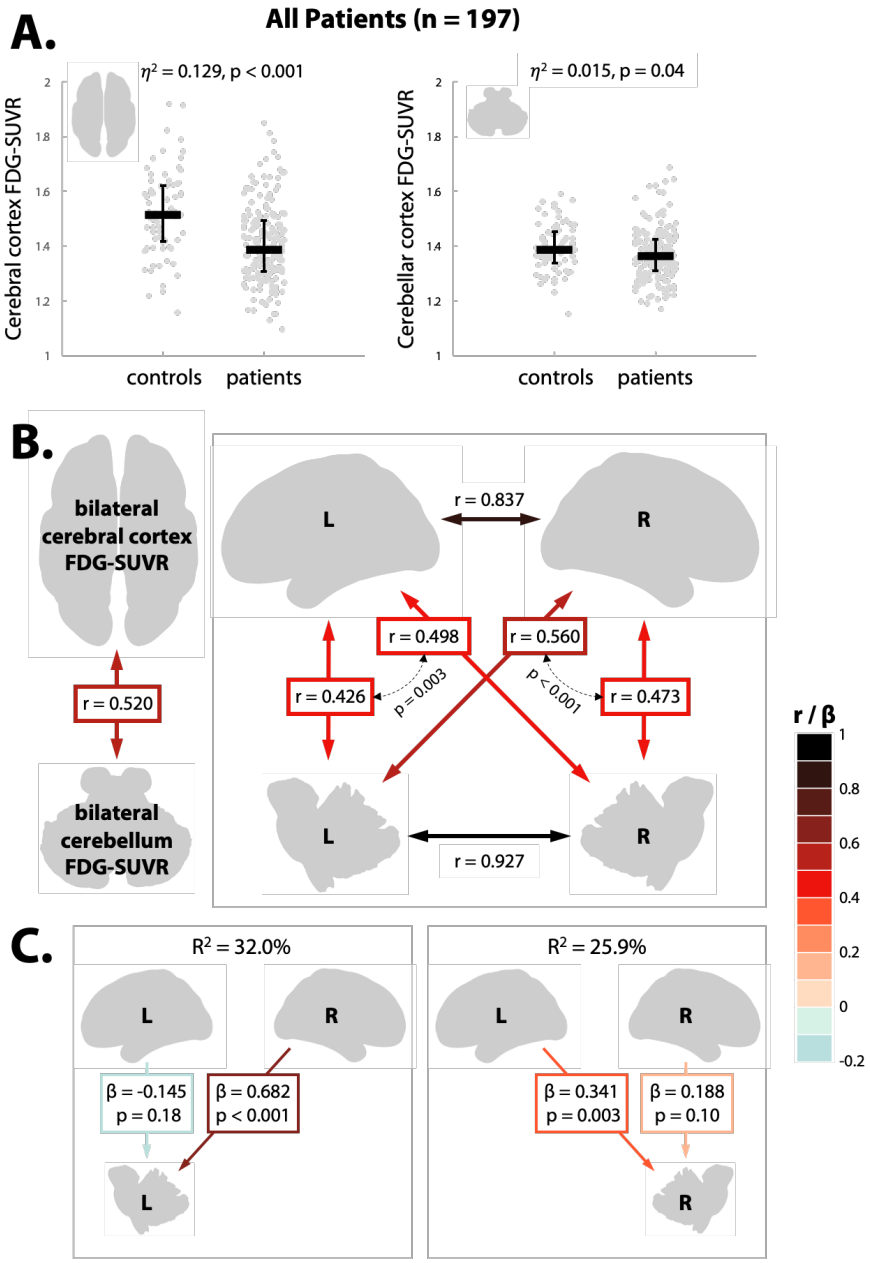
Supplementary Table 4. Tests of cerebellar function on neurological examination in patients

Number of subjects with abnormal test are indicated with percentage (%). For bilateral tests, number of subjects with asymmetric findings (L>R or R>L) are indicated with percentage (%).

Act. Tremor: action or postural tremor. UL: upper limbs, LL: lower limbs

Pron. Sup.: pronation/supination of hand

Fing. Nose: Finger to Nose



Supplementary Figure 4. Analyses similar to Figure 6 but additionally including the 51 patients with significant cerebellar ^{18}F-FDG asymmetry.