

Choroid Plexus Volume is Negatively Associated with Levels of CSF Proteins

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http://adni.loni.usc.edu/wpcontent/uploads/how_to_apply/ADNI_Acknowledgement_List.pdf

Supplemental Information: 3 Tables, 3 Figures

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PPMI								
Variables	t-tau		p-tau		A β		α -syn	
	coef	p	coef	p	coef	p	coef	p
Age	0.009	<0.001	0.003	-	-0.001	-	0.003	0.15
Sex (male)	-0.064	-	0.03	-	-0.05	-	0.01	0.85
ChP volume (ml)	-0.19	< 0.001	-0.1	< 0.01	-0.16	< 0.001	-0.19	< 0.001
Ventricular volume (ml)	-0.003	< 0.01	-0.004	< 0.01	-0.002	< 0.001	-0.004	< 0.001
APOE ϵ 4	-0.003	-	0.03	-	-0.15	< 0.001	-0.015	-
Cortical volume (ml)	0.0007	-	0.0007	-	0.0004	-	-0.0002	-
Group PD	-0.12	-	-0.12	-	0.005	-	-0.12	-
ADNI								
Age	0.008	< 0.01	0.009	< 0.01	-0.012	< 0.001	-	-
Sex (male)	-0.065	-	-0.05	-	-0.12	< 0.01	-	-
ChP volume (ml)	-0.098	< 0.01	-0.092	< 0.01	-0.23	< 0.001	-	-
Ventricular volume (ml)	-0.0023	-	-0.001	-	-0.013	< 0.001	-	-
APOE ϵ 4	0.27	< 0.001	0.3	< 0.001	-0.47	< 0.001	-	-
Cortical volume (ml)	-0.0013	< 0.01	-0.001	< 0.01	0.0016	< 0.01	-	-
Group SMC	-0.013	-	-0.017	-	-0.0005	-	-	-
EMCI	0.031	-	0.032	-	-0.15	0.01	-	-
LMCI	0.17	< 0.001	0.17	< 0.001	-0.37	< 0.001	-	-
AD	0.45	< 0.001	0.45	< 0.001	-0.64	< 0.001	-	-

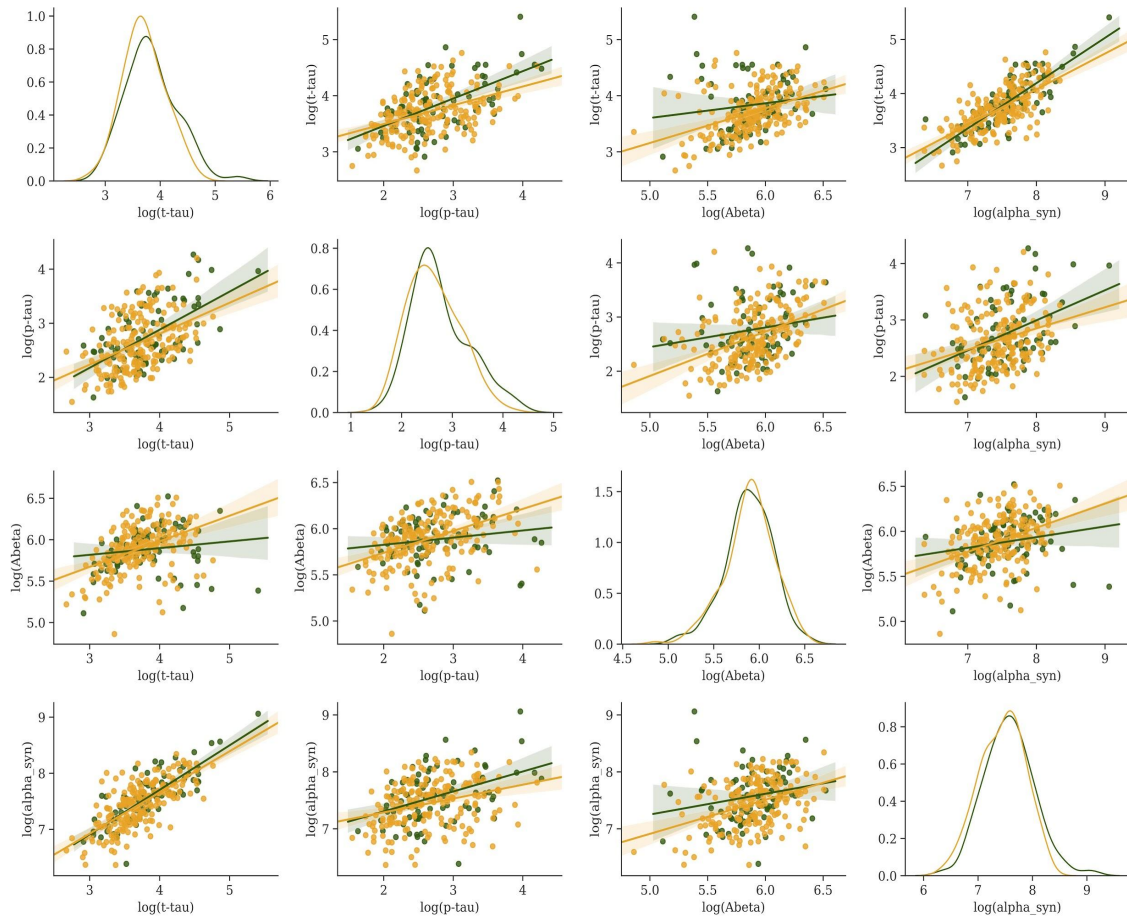
Supplementary Table 1: Univariate analysis of association between CSF protein levels and independent variables including age, sex, ChP volume, ventricular volume, APOE ϵ 4, cortical volume, and group. Note: PPMI: Parkinson's Progression Markers Initiative; ADNI: Alzheimer's Disease Neuroimaging Initiative; ChP: choroid plexus; APOE ϵ 4: apolipoprotein E ϵ 4 allele; PD: Parkinson's disease; AD: Alzheimer's disease; SMC: significant memory concern; EMCI: early-mild cognitive impairment; LMCI: late-mild cognitive impairment; t-tau: total-tau; p-tau: phosphorylated-tau; A β : amyloid- β ; α -syn: α -synuclein

PPMI								
	t-tau		p-tau		Aβ		α-syn	
	coef	p	coef	p	coef	p	coef	p
Age	0.018	< 0.01	0.013	< 0.01	0.002	-	0.010	< 0.01
Sex (male)	-0.004	-	0.041	-	-0.016	-	0.106	-
APOE ϵ 4	0.023	-	0.018	-	-0.175	< 0.01	-0.010	-
ChP volume (ml)	-0.248	< 0.01	-0.115	-	-0.111	< 0.01	-0.250	< 0.01
Cortical volume (ml)	0.000	-	0.001	-	0.001	0.01	0.000	-
Ventricular volume (ml)	-0.003	-	-0.007	0.01	-0.001	-	-0.003	-
TBV(ml)	0.000	-	0.000	-	0.000	-	0.000	-
Group PD	-0.172	< 0.01	-0.142	-	-0.004	-	-0.151	< 0.01
ADNI								
Age	0.016	< 0.01	0.017	< 0.01	-0.005	-		
Sex (male)	-0.061	-	-0.057	-	-0.073	-		
APOE ϵ 4	0.202	< 0.01	0.251	-	-0.421	< 0.01		
ChP volume (ml)	-0.196	< 0.01	-0.207	< 0.01	-0.096	-		
Cortical volume (ml)	-0.001	-	-0.001	-	0.001	-		
Ventricular volume (ml)	-0.004	< 0.01	-0.004	< 0.01	-0.004	< 0.01		
TBV (ml)	0.001	< 0.01	0.001	< 0.01	0.000	-		
Group SMC	-0.016	-	-0.021	-	-0.014	-		
EMCI	0.046	-	0.060	-	-0.088	-		
LMCI	0.185	< 0.01	0.224	< 0.01	-0.234	< 0.01		
AD	0.435	< 0.01	0.490	< 0.01	-0.334	< 0.01		-

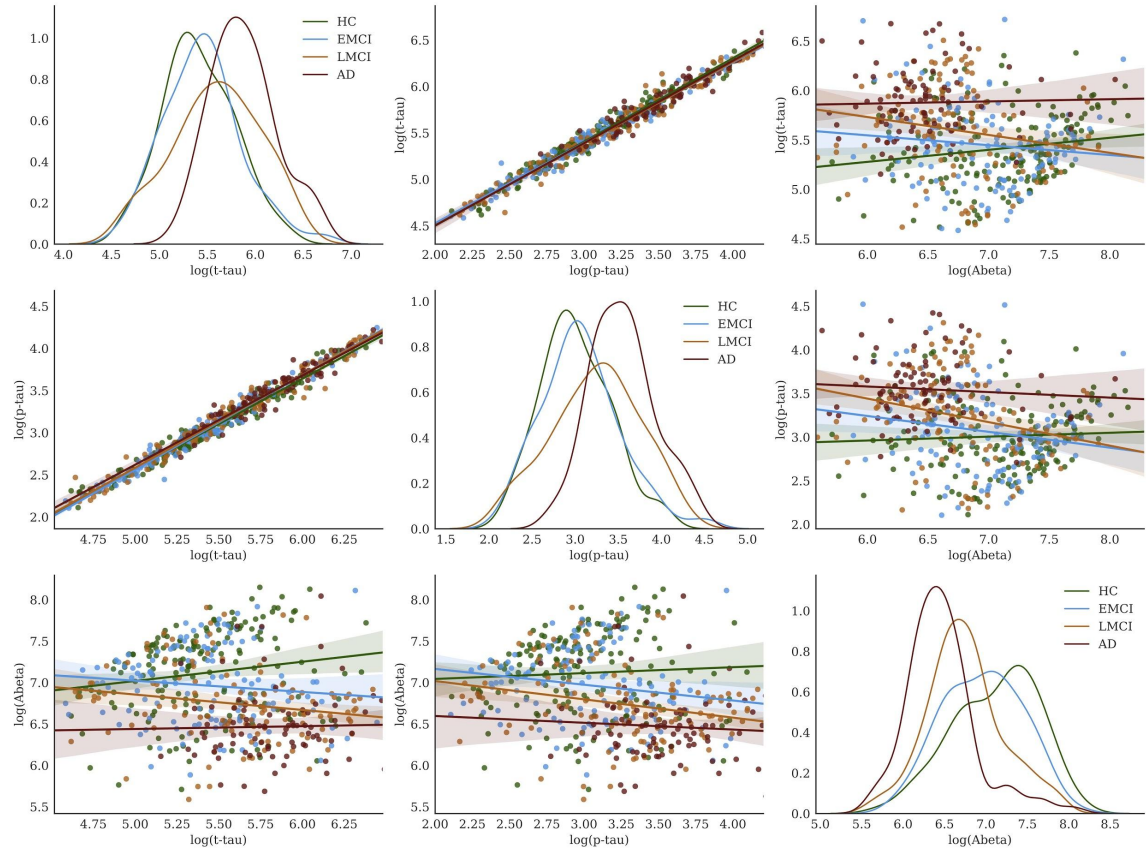
Supplementary Table 2: Adding total brain volume (TBV) as a covariate to multiple regression analyses.

PPMI								
	t-tau		p-tau		Aβ		α-syn	
	coef	p	coef	p	coef	p	coef	p
Age	0.019	< 0.01	0.014	< 0.01	0.002	-	0.012	< 0.01
Sex (male)	-0.019	-	0.098	-	0.013	-	0.069	-
APOE ϵ 4	0.024	-	0.021	-	-0.171	< 0.01	-0.009	-
ChP /TBV (ml)	-3.707	< 0.01	-1.949	-	-1.855	< 0.01	-3.667	< 0.01
Cortical/TBV (ml)	0.938	-	1.584	-	1.821	-	0.170	-
Ventricle/TBV (ml)	-6.885	-	-11.835	< 0.01	-1.365	-	-8.314	0.010
Group PD	-0.176	< 0.01	-0.128	-	0.003	-	-0.162	< 0.01
ADNI								
Age	0.016	< 0.01	0.018	< 0.01	-0.005	-		
Sex (male)	-0.066	-	-0.057	-	-0.051	-		
APOE ϵ 4	0.200	< 0.01	0.249	< 0.01	-0.424	< 0.01		
ChP /TBV (ml)	-2.940	< 0.01	-3.162	< 0.01	-1.579	0.010		
Cortical/TBV (ml)	-1.401	-	-1.592	-	0.751	-		
Ventricle/TBV (ml)	-6.684	< 0.01	-7.185	< 0.01	-6.553	< 0.01		
Group SMC	-0.015	-	-0.018	-	-0.007	-		
EMCI	0.046	-	0.060	-	-0.088	-		
LMCI	0.187	< 0.01	0.226	< 0.01	-0.235	< 0.01		
AD	0.440	< 0.01	0.494	< 0.01	-0.336	< 0.01		-

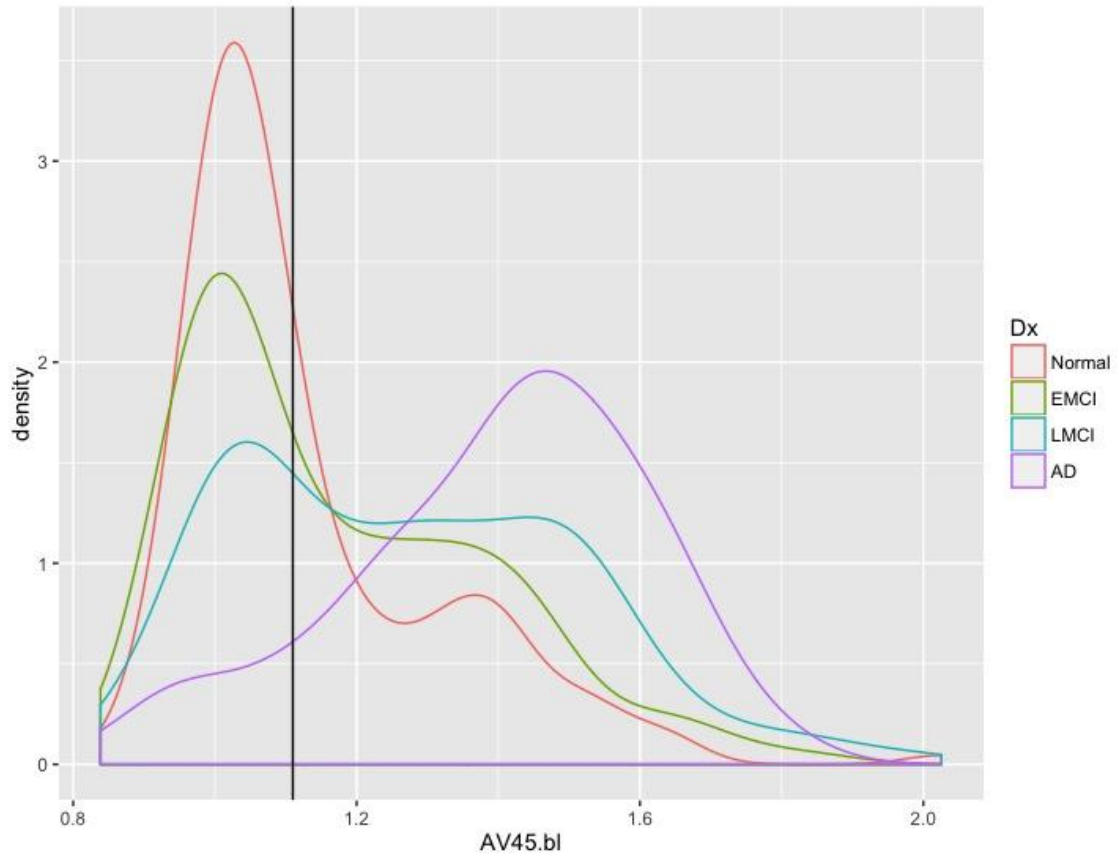
Supplementary table 3: Multiple regression analyses using normalized brain volumes (by total brain volume (TBV)).



Supplementary Figure 1: Paired plot showing correlations between pairs of CSF proteins in the PPMI dataset. The diagonal plots represent the CSF protein histogram. Orange: PD, Green: HC



Supplementary Figure 2: Paired plot showing correlations between pairs of CSF proteins in the ADNI dataset. The diagonal plots represent the CSF protein histograms in each group.



Supplementary Figure 3: florbetapir (AV45) SUVR density histograms at baseline for normal, EMCI, LMCI, and AD groups. We used $SUVR \geq 1.11$ (the vertical line) as the threshold for positive amyloid- β .