

## **Supplementary Materials**

### **Soluble TREM2 is elevated in Parkinson's disease subgroups with elevated CSF tau**

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## Supplementary Tables

**Supplementary Table S1. CSF Amyloid and Tau Biomarkers**

	Healthy Controls (n = 17)	Pure LB PD (n =86)	Amyloid+ PD (n=16)	Amyloid+ Tau+ PD (n=23)	Tau+ PD (n=23)	P-value*
CSF A $\beta$ 1-42 (pg/ml; Mean, SD)	1002.77 (390.94)	1000.14 (334.19)	596.75 (201.42)	756.13 (322.66)	1748.83 (455.96)	<0.0001
CSF A $\beta$ 1-40 (pg/ml; Mean, SD)	7987.59 (2853.18)	7568.00 (2218.13)	6981.81 (1974.63)	10146.17 (3107.54)	12902.22 (2522.55)	<0.0001
CSF t-tau (pg/ml; Mean, SD)	225.94 (90.70)	217.12 (91.54)	161.44 (67.37)	559.48 (303.61)	382.13 (112.74)	<0.0001
CSF p-tau 181 (pg/ml; Mean, SD)	33.37 (11.11)	27.38 (6.52)	38.01 (7.92)	67.81 (32.44)	48.58 (8.53)	<0.0001

\*Kruskal-Wallis test

**Supplementary Table S2. Figure 1 Outlier Removal: CSF sTREM2 as a function of Clinical Diagnosis, age, and gender.**

Group	No. of Outliers
Healthy Control	0
PDN	2
PDMCI	4
PDD	0

	Outliers Included	Outliers removed
<b>One-way ANCOVA</b>	F(3,159) = 4.588, P = 0.004	F(3,153) = 4.0781, P = 0.008
<b>Post Hoc Tukey Contrasts - Adjusted P values</b>		
HC VS PDN	P = 0.046	P = 0.071
HC VS PDMCI	ns	ns
HC VS PDD	ns	ns
PDN VS PDMCI	ns	ns
PDN VS PDD	ns	ns
PDMCI VS PDD	ns	ns

**Supplementary Table S3. Figure 1 Outlier Removal: Plasma sTREM2 as a function of Clinical Diagnosis, age, and gender.**

Group	No. of Outliers
Healthy Control	0
PDN	5
PDMCI	18
PDD	4

	<b>Outliers Included</b>	<b>Outliers removed</b>
<b>One-way ANCOVA</b>	F(3,159) = 0.518, P = 0.671	F(3,132) = 0.575, P = 0.632
<b>Post Hoc Tukey Contrasts - Adjusted P values</b>		
HC VS PDN	ns	ns
HC VS PDMCI	ns	ns
HC VS PDD	ns	ns
PDN VS PDMCI	ns	ns
PDN VS PDD	ns	ns
PDMCI VS PDD	ns	ns

Supplementary Table S4. Figure 3 Outlier Removal: CSF sTREM2 as a function of Biomarker profile, age, and gender.

<b>Group</b>	<b>No. of Outliers</b>
Healthy Control	0
Pure LB PD	1
Amyloid+ PD	0
Amyloid+ Tau+ PD	0
Tau+ PD	1

	<b>Outliers Included</b>	<b>Outliers removed</b>
<b>One-way ANCOVA</b>	F(4,158) = 8.926, P < 0.0001	F(4,156) = 9.1652, P < 0.0001
<b>Post Hoc Tukey Contrasts - Adjusted P values</b>		
HC vs Pure LB PD	ns	ns
HC vs Amyloid+ PD	ns	ns
HC vs Amyloid+ Tau+ PD	P < 0.001	P < 0.001
HC vs Tau+ PD	P < 0.001	P = 0.0017
Pure LB PD vs Amyloid+ PD	ns	ns
Pure LB PD vs Amyloid+ Tau+ PD	P < 0.001	P = 0.0070
Pure LB PD vs Tau+ PD	P = 0.0017	ns
Amyloid+ PD vs Amyloid+ Tau+ PD	P = 0.0107	P < 0.001
Amyloid+ PD vs Tau+ PD	P = 0.0574	P = 0.0036
Amyloid+ Tau+ PD vs Tau+ PD	ns	ns

Supplementary Table S5. Figure 4 Outlier Removal: CSF sTREM2 as a function of biomarker profile in each cognitive subgroup, age, and gender.

<b>Cognitively Normal</b>		<b>MCI</b>		<b>Dementia</b>	
<b>Group</b>	<b>No. of Outliers</b>	<b>Group</b>	<b>No. of Outliers</b>	<b>Group</b>	<b>No. of Outliers</b>
Healthy Control	0	Healthy Control	0	Healthy Control	0
Pure LB PD	0	Pure LB PD	2	Pure LB PD	0
Amyloid+ PD	0	Amyloid+ PD	0	Amyloid+ PD	0
Amyloid+ Tau+ PD	0	Amyloid+ Tau+ PD	0	Amyloid+ Tau+ PD	0
Tau+ PD	1	Tau+ PD	0	Tau+ PD	0

	Cognitively Normal		MCI		Dementia	
	Outliers Included	Outliers removed	Outliers Included	Outliers removed	Outliers Included	Outliers removed
One-way ANCOVA	F(3,39) = 4.415, P = 0.009	F(3,38) = 3.608, P = 0.022	F(3,80) = 6.626, P = 0.001	F(3,28) = 8.707, P < 0.0001	F(2,12) = 4.498, P = 0.035	No Outliers Detected
Post Hoc Tukey Contrasts - Adjusted P values						
Pure IB PD vs Amyloids PD	ns	ns	ns	ns	ns	No Outliers Detected
Pure IB PD vs Amyloids Tau PD	P = 0.0476	P = 0.0301	P = 0.0016	P < 0.001	P = 0.00282	No Outliers Detected
Pure IB PD vs Tau PD	P = 0.0468	ns	P = 0.0517	P = 0.010	No Tau+ PD Participants	No Outliers Detected
Amyloids PD vs Amyloids Tau PD	ns	ns	P = 0.0090	P = 0.0060	ns	No Outliers Detected
Amyloids PD vs Tau PD	ns	ns	ns	ns	No Tau+ PD Participants	No Outliers Detected
Amyloids Tau PD vs Tau PD	ns	ns	ns	ns	No Tau+ PD Participants	No Outliers Detected

Supplementary Table S6. Figure 5 Outlier Removal: Association between CSF sTREM2 and CSF amyloid and tau biomarkers

CSF Biomarker	Cognitively Normal	MCI	Dementia
T-tau	2	3	1
P-Tau181	5	4	1
AB1-42	3	0	0
AB1-40	0	0	0

	Cognitively Normal					
	Outliers Included			Biomarker Outliers Removed		
	$\beta$	SE	P	$\beta$	SE	P
CSF sTREM2 and T-tau	+0.592	0.186	0.003	+0.525	0.269	0.059
CSF sTREM2 and P-Tau181	+1.068	0.262	0.0002	+0.810	0.313	0.014
CSF sTREM2 and AB1-42	+0.327	0.209	0.126	+0.203	0.245	0.414
CSF sTREM2 and AB1-40	+0.910	0.234	0.0004	+0.910	0.234	<0.001

	Mild Cognitive Impairment					
	Outliers Included			Outliers Removed		
	$\beta$	SE	P	$\beta$	SE	P
CSF sTREM2 and T-tau	+0.510	0.118	< 0.001	+0.250	0.141	0.079
CSF sTREM2 and P-Tau181	+0.349	0.156	0.028	+0.449	0.18	0.015
CSF sTREM2 and AB1-42	+0.140	0.14	0.32	+0.095	0.14	0.319
CSF sTREM2 and AB1-40	+0.329	0.177	0.067	+0.329	0.177	0.067

	Dementia					
	Outliers Included			Outliers Removed		
	$\beta$	SE	P	$\beta$	SE	P
CSF sTREM2 and T-tau	+0.511	0.267	0.078	+0.677	0.371	0.093
CSF sTREM2 and P-Tau181	+0.477	0.177	0.018	+0.543	0.212	0.024
CSF sTREM2 and AB1-42	+0.214	0.318	0.512	+0.214	0.318	0.512
CSF sTREM2 and AB1-40	+0.797	0.243	0.006	+0.797	0.243	0.006

**Supplementary Table S7. Figure 6 Outlier Removal: Association between CSF sTREM2 and MoCA**

<b>Diagnostic Group</b>	<b>No. of Outliers</b>
Pure LB PD	1
Amyloid+ PD	0
Amyloid+ Tau+ PD	0
Tau+ PD	0

	<b>Outliers Included</b>			<b>Outliers Removed</b>		
	$\beta$	SE	<i>P</i>	$\beta$	SE	<i>P</i>
Pure LB PD	+0.079	0.012	0.456	+0.009	0.021	0.675
Amyloid+ PD	+0.316	0.028	0.348	No Outliers Detected		
Amyloid+ Tau+ PD	+0.545	0.028	0.021	No Outliers Detected		
Tau+ PD	+0.538	0.059	0.036	No Outliers Detected		